

*Exploring*  
the  
Syntax-Semantics  
Interface

Robert D. Van Valin, Jr.

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## Exploring the Syntax–Semantics Interface

Language is a system of communication in which grammatical structures function to express meaning in context. While all languages can achieve the same basic communicative ends, they each use different means to achieve them, particularly in the divergent ways that syntax, semantics and pragmatics interact across languages. This book looks in detail at how structure, meaning and communicative function interact in human languages. Working within the framework of Role and Reference Grammar (RRG), Van Valin proposes a set of rules, called the ‘linking algorithm’, which relates syntactic and semantic representations to each other, with discourse-pragmatics playing a role in the linking. Using this model, he discusses the full range of grammatical phenomena, including the structures of simple and complex sentences, verb and argument structure, voice, reflexivization and extraction restrictions. Clearly written and comprehensive, this book will be welcomed by all those working on the interface between syntax, semantics and pragmatics.

ROBERT D. VAN VALIN JR. is Professor of Linguistics at the University at Buffalo, The State University of New York, and is the primary developer of the framework of Role and Reference Grammar. He is co-author of *Functional Syntax and Universal Grammar* (Cambridge University Press, 1984), editor of *Advances in Role and Reference Grammar* (1993), primary author of *Syntax: Structure and Function* (Cambridge University Press, 1997), and author of *An Introduction to Syntax* (Cambridge University Press, 2001). He has published many articles on syntax, universal grammar, language typology, language acquisition and neurolinguistics.



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# Preface

This book is an introduction to Role and Reference Grammar, which updates the presentation of the theory presented in *Syntax: structure, meaning and function*. It includes the major developments in the theory since the publication of *Syntax* in 1997. It can be used as a textbook for teaching Role and Reference Grammar, and while it does not contain any exercises, the exercises from *Syntax* can be used with this book as well. The following table relates the exercises from the earlier book to the chapter topics in this one.

Exercises in <i>Syntax</i>	Chapter in this book
Chapter 2	Chapter 1
Chapters 3, 4	Chapter 2
Chapter 5	Chapter 3
Chapter 6	Chapter 4
Chapter 7	Chapter 5
Chapter 8	Chapter 6
Chapter 9	Chapter 7

These exercises (with password-protected solutions) are available online [www.cambridge.org/052101056X](http://www.cambridge.org/052101056X).

This book has benefited greatly from comments and suggestions from many people over the course of its long gestation. I would especially like to thank the many participants in courses on Role and Reference Grammar, both at the University at Buffalo and at universities around the world, for their indispensable insights, comments and suggestions, especially Jeruen Dery, Klaus Michael Geyer, Anja Latrouite, Heike Lehnert, Mark Miller, John Roberts and Janick Wrona. I would also like to thank Delia Bentley, Balthasar Bickel, Daniel Everett, Rolf Kailuweit, Craig Kopris, Kwee Tjoe Liong, Beth Levin, Laura Michaelis, Toshio Ohori, Mitsuaki Shimojo, Richard Weist and David Wilkins for their valuable input.

# Abbreviations

A, ACT	actor
A <sub>T</sub>	actor of transitive verb
ABS	absolutive
ACC	accusative
ACS	accessible
ACV	activated
ADV	adverb
AFD	actual focus domain
ANTI	antipassive
AOR	aorist
APPL	applicative
ART	article
ASP	aspect
ATV	active voice
AUG	stem augment
AUH	actor–undergoer hierarchy
AUX	auxiliary
BNU	brand new – unanchored
CAUS	causative
CL	classifier
CLM	clause-linkage marker
CONT	continuative
COP	copula
DAT	dative
DCA	direct core argument
DCT	direct
DEC	declarative
DEF	definite
DEIC	deictic
DEM	demonstrative
DEP	dependent
DET	determiner
DIR	directional
dl	dual
DOBJ	direct object

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d-S	derived intransitive subject
DS	different subject
DSTR	distributive
DT	different topic
DTR	detransitivizer
ERG	ergative
EVID	evidential
EVQ	event quantification
F	feminine
FOC	focus
FPAST	far past
FUT	future
GEN	genitive
HON	honorific
HPSG	Head-Driven Phrase Structure Grammar
HS	hearsay
IF	illocutionary force
IMP	imperative
IMPER	impersonal
IMPF	imperfective
IN	inchoative
INA	inactive
INAN	inanimate
INCL	inclusive
IND	indicative
INF	infinitive
INFER	inferential
INGR	ingressive
INST	instrumental
INT	interrogative
INTR	intransitive
IRR	irrealis
ITER	iterative
IU	information unit
LDP	left detached position
LFG	Lexical-Functional Grammar
LNK	linker
LOC	locative
LS	logical structure
LSC	layered structure of the clause
LSNP	layered structure of the noun phrase
M	masculine
MOD	modality
MR	macrorole

N	neuter
NASP	nominal aspect
NEG	negative
NEGPAST	negative past
NM	noun marker
NMR	non-macrorole
NOM	nominative
NONSIM	non-simultaneous
NP	noun phrase
NPFP	NP-final position
NPIP	NP-initial position
NPP	non-past progressive
ns	non-singular
NUC	nucleus
NUM	number
OBJ	object
OBL	oblique
OBLG	obligation
P	preposition/postposition
PART	participle
PASS	passive
PAST	past tense
PER	periphery
PERF	perfect
PFD	potential focus domain
pl	plural
PM	proper noun marker
PoCS	postcore slot
POL	politeness marker
PP	prepositional/postpositional phrase
PrCS	precore slot
PRDM	predicate marker
PRED	predicate
PRES	present
PRESUM	presumptive evidential
PRFV	perfective
PRO	pronoun
PROC	process
PROG	progressive
PROP	proper
PROX	proximate
PRT	particle
PSA	privileged syntactic argument
PSBL	possible

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PSTP	past participle
Q	question marker
QLT	quality
QNT	quantifier
RDP	right-detached position
REFL	reflexive
REL	relative
REMPST	remote past
RES	result
RRG	Role and Reference Grammar
S	intransitive subject
SEML	semelfactive
SEQ	sequential
sg	singular
SH	subject honorific
SIM	simultaneous
SP	same privileged syntactic argument
SPEC	specific
SS	same subject
STA	status
SUBJ	subject
SUFF	suffix
TM	terminal marker
TNS	tense
TOP	topic
TPAST	today's past
TR	transitive
U, UND	undergoer
U <sub>T</sub>	undergoer of transitive verb
V	verb
VBLZ	verbalizer
VIS	visual evidence evidential
VP	verb phrase
XP	phrase of category X
YPAST	yesterday's past





# Introduction

This book is concerned with how structure, meaning and communicative function interact in human languages. Language is a system of communicative social action in which grammatical structures are employed to express meaning in context. While all languages can achieve the same basic communicative ends, different languages use different linguistic means to achieve them, and an important aspect of these differences concerns the divergent ways syntax, semantics and pragmatics interact across languages. For example, the noun phrase referring to the entity being talked about (the ‘topic’) may be signalled by its position in the clause, by its grammatical function, by its morphological case, or by a particle in different languages, and moreover in some languages this marking may have important grammatical consequences and in other languages it may not.

The framework in which this investigation is to be carried out is Role and Reference Grammar [RRG].<sup>1</sup> RRG grew out of an attempt to answer two basic questions, which were originally posed during the mid-1970s: (1) what would linguistic theory look like if it were based on the analysis of languages with diverse structures such as Lakhota, Tagalog and Dyirbal, rather than on the analysis of English?, and (2) how can the interaction of syntax, semantics and pragmatics in different grammatical systems best be captured and explained? Accordingly, RRG has developed typologically motivated descriptive tools and theoretical principles which are designed to expose this interaction and offer explanations for it. It posits three main representations: (1) a representation of the syntactic structure of sentences, which corresponds closely to the actual structural form of utterances, (2) a semantic representation representing important facets of the meaning of linguistic expressions, and (3) a representation of the information (focus) structure of the utterance, which is related to its communicative function. There is a set of rules, called the linking algorithm, which relates the syntactic and semantic representations to each other, and discourse-pragmatics plays a role in the linking. From an RRG perspective, one of the most important ways in which languages differ from each other is in terms of the manner in which discourse-pragmatics interacts with the linking between syntax and semantics. This is summarized in Figure 1.

<sup>1</sup> A bibliography of work in RRG is available on the RRG web site ([linguistics.buffalo.edu/research/rrg.html](http://linguistics.buffalo.edu/research/rrg.html)), along with papers, master's theses and dissertations in PDF format for downloading. It is the best source for the most up-to-date work in the theory.

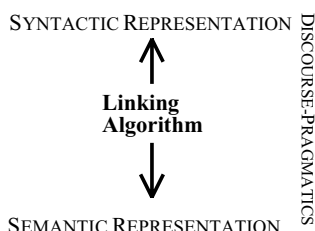


Figure 1 *Organization of Role and Reference Grammar*

RRG seeks to be more than a descriptive framework for the analysis of languages; it also strives to provide an explanatory framework for the analysis of language acquisition and language processing. See Van Valin and LaPolla (1997), ‘Epilog’, and the references cited therein, also Van Valin (1998, 2001a, 2002, 2005), Butler (2004), Weist (2002), and Weist *et al.* (2004).

Thus, this exploration of the syntax, semantics and pragmatics interface will also be an explication of RRG; this presentation presupposes no prior acquaintance with the theory.<sup>2</sup> The discussion will proceed as follows. The first five chapters deal with simple clauses: in chapter 1 the conception of clause structure proposed in RRG will be detailed; chapter 2 brings in the theory of lexical representation and semantic roles; in chapter 3 the notion of information structure is introduced and related to clause structure; chapter 4 introduces grammatical functions and their interaction with semantic roles and information structure; and chapter 5 presents the algorithm which links syntactic and semantic representations in simple clauses. The next two chapters deal with complex sentences: in chapter 6 the approach to the syntax and semantics of clause linkage is outlined, and in chapter 7 the linking algorithm is expanded to deal with argument linking in complex sentences.

<sup>2</sup> It does presuppose a basic introduction to syntax, as found in, e.g., Carnie (2002), Tallerman (1998), Van Valin (2001b). See Butler (2003) for a critical introduction to RRG along with a comparison of it with Functional Grammar and Systemic Functional Grammar.

# 1 Syntactic structure

## 1.0 General considerations

The first step in the exploration of the syntax, semantics and pragmatics interface in the grammatical systems of human languages is to characterize the nature of syntactic structure, which includes the structure of clauses, of adpositional phrases and noun phrases. There are two fundamental aspects of clause structure which every theory must deal with; they may be termed **RELATIONAL** and **NON-RELATIONAL**. Relational structure is concerned with relations between a predicate and its argument(s); they may be syntactic, semantic, pragmatic or some combination thereof; these relations will be the topics of chapters 2–4. Non-relational structure is concerned with the hierarchical organization of phrases, clauses and sentences; it is the topic of this chapter.

From an RRG point of view, there are two general considerations that a theory of clause structure must meet. They are given in (1.1).

- (1.1) General considerations for a theory of clause structure:
- a. A theory of clause structure should capture all of the universal features of clauses without imposing features on languages in which there is no evidence for them.
  - b. A theory should represent comparable structures in different languages in comparable ways.

These are very strong conditions, especially considering that RRG does not posit any abstract underlying syntactic representations; the syntactic representation of a sentence corresponds closely to its actually occurring form.

## 1.1 The layered structure of the clause

These considerations lead to a very different conception of clause structure in RRG from that assumed in other approaches. First, because it is concerned with the interplay of syntax, semantics and pragmatics in grammatical systems, the representation of clauses must allow for the representation of all of these factors, where necessary. This renders a representation in terms of purely syntactic features highly inappropriate. Second, the theory is greatly concerned

with typological issues. In particular, it seeks to uncover those aspects of clause structure which are found in all human languages; hence the conception of clause structure it posits must be equally applicable to free-word-order, flat-syntax languages such as Dyirbal and Malayalam, to head-marking languages like Lakhota and Tzotzil (see section 1.4), and to fixed-order, configurational, dependent-marking languages like English and Icelandic. It must, further, be applicable to these languages without recourse to positing abstract underlying representations and derivations from abstract to overt representations.

The RRG notion of (non-relational) clause structure is called ‘the layered structure of the clause’ and it is based on two fundamental contrasts: between the predicate and non-predicating elements, on the one hand, and, among the non-predicating elements, between arguments and non-arguments, on the other, i.e. between those NPs and adpositional phrases which are arguments of the predicate and those which are not. These contrasts are found in all languages, regardless of whether they are configurational or non-configurational, head-marking or dependent-marking, free-word-order or fixed-word-order. On this view, the primary constituent units of the clause are the ‘nucleus’, which contains the predicate (usually a verb), the ‘core’, which contains the nucleus and the arguments of the predicate, and a ‘periphery’, which subsumes non-arguments of the predicate, e.g. setting locative and temporal phrases (see section 1.5). This may be informally represented as in the box diagrams in Figures 1.1 and 1.2. The semantic motivation for these units is summarized in Table 1.1. The semantic representations which underlie the notion of core argument will be presented in chapter 2.

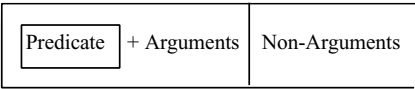


Figure 1.1 *Universal oppositions underlying clause structure*

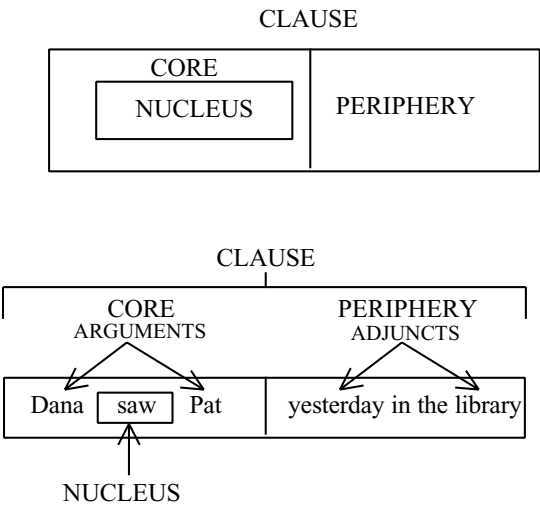


Figure 1.2 *Components of the layered structure of the clause*

Table 1.1 *Semantic units underlying the syntactic units of the layered structure of the clause*

Semantic element(s)	Syntactic unit
Predicate	Nucleus
Argument in semantic representation of predicate	Core argument
Non-arguments	Periphery
Predicate + Arguments	Core
Predicate + Arguments + Non-arguments	Clause (= Core + Periphery)

Since these hierarchical units are defined semantically and not syntactically, they are not dependent upon either immediate dominance or linear precedence relations. Accordingly, the elements in these units may in principle occur in any order, if a given language permits it. This is illustrated in (1.2) from Dyirbal, an Australian Aboriginal language with exceptionally free word order; all of the sentences in (1.2) mean ‘The man speared the wallaby in the mountains.’

- (1.2) Dyirbal (Dixon 1972)
- Bayi bargan<sub>CORE</sub> bangul yaɾa-ŋgu<sub>CORE</sub> ɟurɟa-ɲu<sub>NUC</sub>  
DET.ABS wallaby-ABS DET.ERG man-ERG spear-TNS  
mountains-LOC  
gambi-ɾa<sub>PER</sub>.
  - Bangul yaɾaŋgu<sub>CORE</sub> gambiɾa<sub>PER</sub> bayi bargan<sub>CORE</sub> ɟurɟaɲu<sub>NUC</sub>.  
man mountains wallaby speared
  - Dyurɟaɲu<sub>NUC</sub> gambiɾa<sub>PER</sub> bayi bargan<sub>CORE</sub> bangul yaɾaŋgu<sub>CORE</sub>.  
speared mountains wallaby man
  - Bayi bargan<sub>CORE</sub> gambiɾa<sub>PER</sub> ɟurɟaɲu<sub>NUC</sub> bangul yaɾaŋgu<sub>CORE</sub>.  
wallaby mountains speared man  
‘The man speared the wallaby in the mountains.’

*Bayi bargan* ‘wallaby (ABS)’ and *bangul yaɾaŋgu* ‘man (ERG)’ are arguments in the core of this clause (i.e. ‘core arguments’), regardless of the word order in the clause, because they are arguments of the predicate *ɟurɟa-* ‘spear’, which is the nucleus of the clause. *Gambiɾa* ‘mountains (LOC)’ is not an argument of *ɟurɟa-*, and therefore it is not part of the core; it is, rather, an element in the periphery of the clause. The hierarchical structure of the clause is semantically motivated and not strictly syntactically based.

There are additional elements which may occur in a simple sentence, i.e. a single-clause sentence. The first is the ‘precore slot’ [PrCS], the position in which question words appear in languages in which they do not occur *in situ*, e.g. English, Italian, Zapotec; it is also the location in which the fronted element in a sentence like *BEAN SOUP I can’t stand* appears. This position is clause-internal but core-external. There is also a ‘postcore slot’ [PoCS] in some verb-final languages, e.g.

Japanese (Shimojo 1995), Dhivehi (Indo-Aryan; Cain and Gair 2000). In Dhivehi, both WH-words and non-WH NPs can occur in the postcore slot; they are in small caps.

- (1.3) a.    Alī bunī                      KĪKE ta?  
           Ali say.PAST.FOC what Q  
           ‘What did Ali say?’
- a'.    Alī kīke bunī                      ta?  
           Ali what say.PAST.FOC Q  
           ‘What did Ali say?’
- b.    Māle uḷunīma                      aharen bonī                      AIS KURĪMU.  
           Male be.PAST.PROG.when 1sg drink.PRES.FOC ice cream  
           ‘When in Male, it is ice cream that I eat.’
- b'.    Māle uḷunīma                      ais kurīmu bonī                      AHAREN.  
           Male be.PAST.PROG.when ice cream drink.PRES.FOC 1sg  
           ‘When in Male, it is I who eat ice cream.’

In addition to a clause, a simple sentence may also include a phrase in a detached position, most commonly in the ‘left-detached position’ [LDP]. This is the location of sentence-initial elements, most commonly adverbials, which are set off from the clause by a pause, e.g. *YESTERDAY, I bought myself a new car* or *AS FOR JOHN, I haven’t seen him in a couple of weeks*. There is also a ‘right-detached position’ [RDP], as in sentences like *I know them, THOSE BOYS*. When the element in a detached position functions as a semantic argument of the verb, there is normally a resumptive pronoun in the core referring to it.

A language which clearly indicates the precore slot – left-detached position contrast is Tzotzil (Aissen 1987, 1992), a VOS Mayan language. In this language the contrast is marked both intonationally and morphologically. This is exemplified in (1.4).

- (1.4) a.    ?i-Ø-s-pet                      lokeḷ ʔantz ti                      ʔul-e.  
           ASP-3ABS-3ERG-carry away woman DEF rabbit-DEF  
           ‘The rabbit carried away the woman.’
- b.    Buchu Ø-s-tam?  
           who 3ABS-3ERG-take  
           ‘Who took it?’
- c.    Kusi ch-Ø-a-kan?  
           what ASP-3ABS-2ERG-want  
           ‘What do you want?’
- d.    Voʔot la ch-a-bat                      ʔun, voʔon la ch-i-kom                      ʔun.  
           2sg CL ASP-2ABS-go CL, 1sg CL ASP-1ABS-stay CL  
           ‘It’s you who’s going, I’m staying.’
- e.    ʔa ti tzeb-e, ʔi-Ø-s-sa?                      s-malal.  
           TOP DEF girl-DEF ASP-3ABS-3ERG-search 3ERG-husband  
           ‘The girl, she searched for her husband.’

Question words occur in immediately preverbal position, as in (b) and (c); there is no pause following them. An NP may also occur in this position, as in (d). This immediately preverbal position is the precore slot. A left-detached position phrase is both set off by a pause and marked by the ‘topic particle’ *?a*, as in (e). The contrast in the discourse functions of phrases in the two positions is illustrated by the following text excerpt (Aissen 1987:158).

- (1.5) [Something had landed at the foot of the tree, they went to look. There was a straw mat. ‘Hell, what could it be? Come on, let’s untie the straw mat!’ the two men said to each other. They untied it. You know what?–]
- a. Tzeb san-andrex la te Ø-s-ta-ik ?un.  
 girl San Andreas CL there 3ABS-3ERG-find-pl CL  
 ‘A San Andreas girl they found there.’
- b. ?a ti tzeb san-antrex ?un-e, ?i-Ø-y-ik-ik la  
 TOP DEF girl San Andreas CL-DEF ASP-3ABS-3ERG-take-pl CL  
 ech’el ?un.  
 away CL  
 ‘The San Andreas girl, they took her with them.’

In (1.5a) *tzeb san-andrex* ‘a San Andreas girl’ is a piece of unexpected new information and is the major focus of the assertion, and consequently it must occur clause-internally in order to be within the domain of the illocutionary force operator. It is preverbal but is not set off by a pause and is not marked by the topic marker *?a*, and accordingly it is in the precore slot. In (b), on the other hand, the same NP is marked by *?a* and set off by a pause, and, in addition, it has already been introduced as a significant participant in the context. Therefore here it is in the left-detached position.

An English sentence containing a precore slot is presented in Figure 1.3. In this representation, an arrow indicates that the periphery is an optional modifier of the core. The periphery will be discussed further in section 1.5. In the sentence in Figure 1.3, *Robin* and *Pat* are arguments within the core, but *Robin* is a direct core argument, while *Pat* is an oblique core argument, because it is marked by a preposition. In languages with case systems, nominative, accusative and dative (or ergative, absolutive and dative) are the direct cases, while the other cases count as oblique.

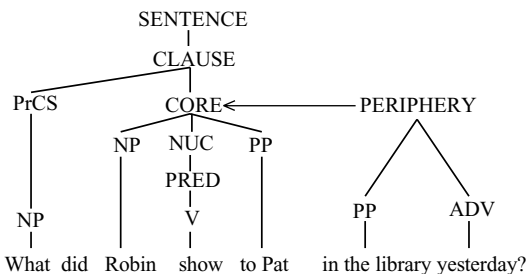


Figure 1.3 *The layered structure of the clause in English*

The RRG conception of the layered structure of the clause is thus a semantically based theory of non-relational syntactic structure; that is, the fundamental units in the hierarchical organization of sentences and clauses are semantically motivated by the contrast between predicate and argument, on the one hand, and that between XPs, i.e. NPs and PPs, which are related to the predicate and those which are not, on the other (see Table 1.1). These units are, however, syntactic units. There are dissociations between the semantic motivations and the syntactic instantiation of these concepts. For example, while the notion of nucleus is based on the semantic notion of predicate, in some languages a nucleus may contain more than the predicate, e.g. an incorporated argument. In Lakhota, the noun *čhú* ‘tree, wood’ can be compounded with the verb *kaksá* ‘chop’ to create *čhəkáksa* ‘wood-chop’, a noun + verb combination that can function as the nucleus of a Lakhota clause. The notion of core argument is motivated by the notion of argument in the semantic representation of the verb, but there are clear instances in English and other languages in which this correlation does not hold. For example, the dummy *it* in *it is snowing* occupies a core argument position but is not a semantic argument of *snow*. Furthermore, in a passive construction like *The bagel was eaten by Chris*, *Chris* is a semantic argument of *eat* but occurs as an adjunct in the periphery. Hence while the semantic distinctions in Table 1.1 motivate the syntactic distinctions, there is no absolute correlation between them.

There is an interesting difference between the universal and non-universal aspects of clause structure. The universal aspects (the nucleus, core, periphery and clause) are all semantically motivated, as shown in Table 1.1. The non-universal aspects (the detached phrases, the extra-core slots) are not semantically motivated; rather, they seem to be pragmatically motivated (or at least are associated with constructions that have strong pragmatic conditions on their occurrence). A major difference between RRG and some other theories is that the category of VP, which plays a central role in Chomskyan approaches, has no analogue in the layered structure of the clause.<sup>1</sup>

## 1.2 Operators

In Figure 1.3, the auxiliary verb *did* is not attached to anything, and this is because it is not part of the nucleus, core or periphery. It is, rather, the morphological realization of a tense ‘operator’ which modifies the clause. Grammatical categories like aspect, tense and modality are treated as operators modifying different layers of the clause. Each of the clause levels may be modified by one or more operators. The operators are summarized in Table 1.2. The nuclear operators have scope over the nucleus; they modify the action, event or state itself

<sup>1</sup> The source of VPs in languages which have them will be discussed in section 3.5.



Table 1.2 *Operators in the layered structure of the clause*

## Nuclear operators:

Aspect

Negation

Directionals (only those modifying orientation of action or event  
without reference to participants)

## Core operators:

Directionals (only those expressing the orientation or motion of one  
participant with reference to another participant or to the speaker)

Event quantification

Modality (root modals, e.g. ability, permission, obligation)

Internal (narrow scope) negation

## Clausal operators:

Status (epistemic modals, external negation)

Tense

Evidentials

Illocutionary force

without reference to the participants. Core operators modify the relation between a core argument, normally the actor, and the action; this is especially true of core directionals and modality. Clausal operators, as the name implies, modify the clause as a whole. They fall into two groups, one containing tense and status, and the other evidentials and illocutionary force. Tense and status situate the proposition expressed by the clause within temporal and realis–irrealis continua; evidentials indicate the epistemological basis of the state of affairs (the proposition plus tense and status operators) expressed, i.e. how the speaker came to have the information being uttered, while illocutionary force specifies the type of speech act. Hence evidentials and illocutionary force are modifiers of the sentence or utterance as a whole, rather than one of its constituent clauses; they are thus ‘sentential’ in nature. They occur only in main (root) clauses, i.e. clauses which are immediately dominated by the sentence node. Negation is the only operator that occurs at all three levels: nuclear negation has only the nucleus in its scope, core negation has one or more core arguments (and possibly also the nucleus) in its scope, and clausal negation has the entire clause in its scope. The classification of a particular operator as nuclear, core or clausal is a direct function of its meaning. No language need have all of these operators as grammatical categories; for example, English, unlike Kewa and Quechua, does not have evidentials as a grammatical category. The only operators which every language has are illocutionary force and negation.

Examples of operators from a variety of languages are given in (1.6)–(1.12). The Kewa examples in (1.6) involve aspect, nuclear directionals (nuclear because they modify the motion of the action, not a participant), and tense. The Turkish examples in (1.7) illustrate aspect and tense in (a) and modality, status and tense

in (b). Both Kewa and Turkish are verb-final, left-branching languages, and consequently the operator-bearing morphemes follow the verb; this is also the case in Barasano in (1.10) and Amele in (1.12). English and Tiwi, which are verb-medial, right-branching languages, exhibit the opposite arrangement: the operator-bearing morphemes precede the verb, as in (1.8) and (1.11). Note that the order of tense, aspect and the verb in the Tiwi example in (1.11) is the mirror image of the order in the Kewa, Turkish and Barasano examples.

- (1.6) Kewa (Papua-New Guinea; Franklin 1971)  
 a. Íra-pa-niaa-ru.  
 cook-PERF-down-1sgPAST (V-ASP-DIR-TNS)  
 'I burned it downward (as a hill).'  
 b. Íra-pa-saa-ru.  
 cook-PERF-up-1sgPAST (V-ASP-DIR-TNS)  
 'I burned it upward (as a hill).'
- (1.7) Turkish (Watters 1993)  
 a. Gel-ıyor-du-m.  
 come-PROG-PAST-1sg (V-ASP-TNS)  
 'I was coming.'  
 b. Gel-emi-yebil-ir-im.  
 come-ABLE.NEG-PSBL-AOR-1sg (V-MOD-STA-TNS)  
 'I may be unable to come.'
- (1.8) English  
 a. He may be leaving soon. (IF/TNS-STA-ASP-V)<sup>2</sup>  
 b. She was able to see them. (IF/TNS-MOD-V)  
 c. Will they have to be leaving? (IF/TNS-MOD-ASP-V)
- (1.9) Korean (Yang 1994)  
 An-tul-li-wu-(si)-lswuiss-cianh-ass-keyss-up-nita.  
 NEG-hear-CAUS-PASS-(SH)-ABLE-NEG-PAST-PRESUM-POL-DEC  
 (NEG-V-MOD-NEG-TNS-EVID-IF)  
 '(I) guess that (he) [HON] might not be heard.'
- (1.10) Barasano (Tucano, South America; Jones and Jones 1991)  
 Gahe-rĩbĩ bota-ri kēã-kudi-ka-bã ĩdã.  
 other-day post-pl chop-ITER-FPAST-VIS 3pl (V-ASP-TNS-EVID)  
 'The next day they went from place to place chopping down posts.'
- (1.11) Tiwi (Australia; Osborne 1974)  
 ɲə-ru-uɳtɪŋ-apa.  
 1sg-PAST-PROG-eat (TNS-ASP-V)  
 'I was eating.'

<sup>2</sup> The reason that illocutionary force and tense are linked in the English examples is that, in English, illocutionary force is indicated by the position of the tense marker in the main clause: interrogative by core-initial tense, declarative by core-internal tense, and imperative by no tense.

- (1.12) Amele (Papua-New Guinea; J. Roberts 1987, 2002)  
 Age bel-ad-ein.  
 3pl go-DSTR-3plREMPST (V-EVQ-TNS)  
 ‘They went in all directions.’

The Amele example illustrates event quantification; the morpheme *-ad-* signals that there are multiple actions of the verb; if it were omitted, yielding *age bel-ein* (3pl go-3plREMPST) ‘they went’, the sentence would mean that there was only one event of going. Event quantification is a core operator, because the core is the minimal expression of an event or state of affairs.

One of the major claims regarding operators made in RRG is that the ordering of the morphemes expressing operators with respect to the verb indicates their relative scopes. That is, taking the nucleus as the reference point, the morphemes realizing nuclear operators should be closer to the nucleus than those expressing core operators, and those manifesting clausal operators should be outside of those signalling nuclear and core operators. The ordering of the operators in the sentences in (1.6)–(1.12) exemplifies this pattern. In every example involving aspect and tense, the aspect marker occurs closer to the verb than the tense marker. Modality and status markers occur outside of aspect (if both occur) but inside of tense, as in (1.7b), (1.8), and (1.9). Evidentials and illocutionary force, the two sentential clausal operators, occur outside of tense in (1.9) and (1.10). This claim assumes, crucially, that a relative order among the morphemes with reference to the nucleus can be established. If, for example, tense is a prefix and aspect is a suffix on the verb, then no relative ordering can be determined and therefore this claim is not applicable; if, on the other hand, both are suffixes, then the claim is that the aspect suffix would be between the verb stem and the tense suffix. This is exemplified in all of the examples in (1.6)–(1.12). A large number of languages are surveyed in Foley and Van Valin (1984) and Bybee (1985), and no exceptions to this general claim are found. Thus, the ordering of operator-expressing affixes in, e.g., Turkish follows exactly the same principle as auxiliary elements in English. It should be noted that within a group of operators at the same level, there is some variation in ordering. Aspect is normally inside of nuclear directionals, but in a few languages it occurs outside of them. Tense and status vary in their position relative to each other across languages, but they are always inside of evidentials and illocutionary force; universally, illocutionary force is always the outermost operator over the clause.

### 1.3 Formal representation of clause structure

Since operators are technically not part of the nucleus, core or periphery, but rather are modifiers of these units and combinations thereof, it is reasonable that they should be represented separately from the predicates and arguments that they modify. Moreover, predicates and arguments are subject to

language-specific constraints on their ordering, while the primary principle governing the ordering of operators is the universal scope constraint mentioned above. The main language-specific consideration affecting their occurrence is the basic word-order type of the language, i.e. whether the language is right-branching or left-branching (Dryer 1992), which governs whether the operators are predominantly prefixes or suffixes, if they are bound morphemes, or whether they occur before or after the nucleus, if they are free morphemes. But the ordering among them is determined by the scope principle. In order to be able to capture the differences between the restrictions on predicates and arguments, on the one hand, and operators, on the other, Johnson (1987) proposed a formalization of the layered structure of the clause in which predicates and their arguments are represented in a distinct projection from the one representing operators. This formalization he termed a ‘projection grammar’. The general schema of a projection grammar representation of the layered structure of the clause is given in Figure 1.4. The top part is called the ‘constituent projection’, the bottom the ‘operator projection’. The two projections are joined through the nucleus, which is the central element in the clause both in terms of defining the range of possible arguments, on the one hand, and being the primary entity to which the operator grammatical categories are oriented, on the other. (This can be seen most clearly in Figure 1.4a.) In the operator projection, the scope of the operator is indicated by the unit which is the

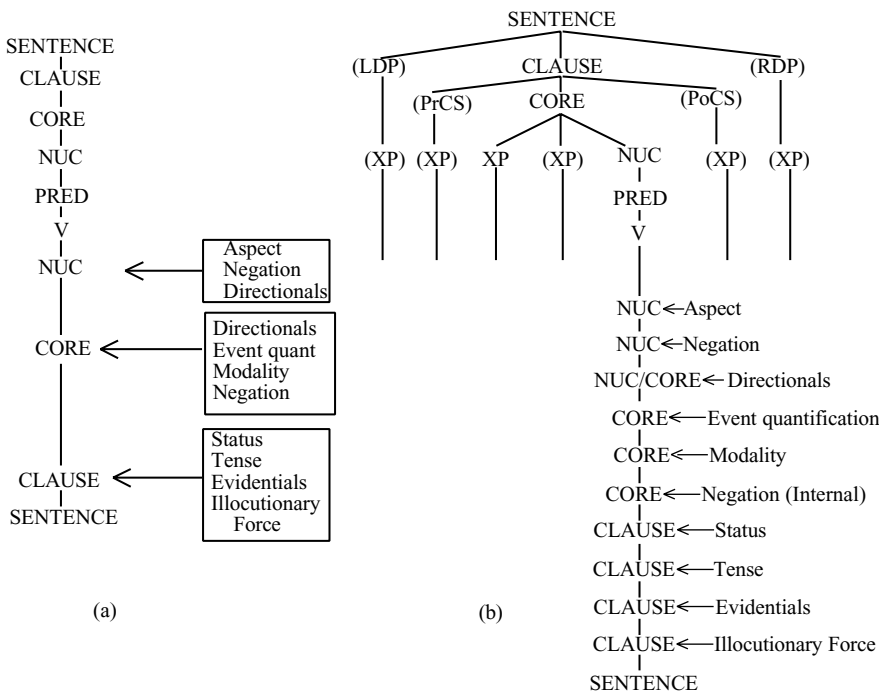


Figure 1.4 *Layered structure of the clause with constituent and operator projections*

target of the arrow. Each operator at a given level is so represented, and if there is more than one, e.g. both tense and illocutionary force, then the relative scopes are explicitly indicated. Examples from English, Japanese and Turkish are given in Figures 1.5–1.8 on the next page. The ‘PRED’ node under the nucleus node is required, because, as will be seen in chapter 6, there are constructions containing a nucleus in which the verb does not predicate; rather, it serves as a modifier of another verb. Hence there is a contrast between nuclei which contain a predicating verb and those which contain a non-predicating verb. In an English copular construction, as in Figure 1.6, the nucleus consists of the predicate nominal, adjective or PP, and *be* is an auxiliary verb serving as a tense-carrier.<sup>3</sup> By separating the constituent from the operator projections, the representations in Figures 1.5 through 1.8 show clearly the similarities in operator orders despite the manifest differences in the predicate-argument arrangement in the three languages.

In RRG, syntactic representations are not specified by phrase-structure rules or the like; rather, the different patterns are stored as ‘syntactic templates’ in a ‘syntactic inventory’. While the layered structure of the clause is universal, there is substantial cross-linguistic variation with respect to the syntactic templates in the syntactic inventory of each language, e.g. languages which lack a precore slot or postcore slot will not have the templates for them, and in some languages the core templates will be ordered (e.g. English), while in others they will not (e.g. Dyirbal). In languages with fixed word order, this will be specified in the syntactic templates. In languages with flexible word order, the templates would be unordered to various degrees, e.g. the verb position is specified but the argument positions are unordered with respect to each other; additional factors, e.g. information structure (see section 5.4.2), would determine the ordering in any particular utterance.

Examples of simplified English templates are given in Figure 1.9 on p. 15; the operator projection and the peripheries have been omitted. Fully specified templates will be presented in chapter 5. In these examples, the templates contain specifications for the NPs and PPs that fill the positions in the core. The template inventory for a language could in fact be simplified if these category labels were omitted; in that case, for example, there would be a single underspecified template replacing the core-5 and core-6 templates for verbs like *give* in both of their linking possibilities, i.e. NP V NP PP and NP V NP NP.

Templates are merged to create the constituent projection of the syntactic representation of a sentence. In the English syntactic inventory, there are templates for each of the various extracore positions (left-detached position, right-detached position, precore slot), and they combine with the core templates to constitute a clause and a sentence. This is illustrated in Figure 1.10 also on p. 15.

<sup>3</sup> *Be* is represented as an auxiliary verb in the nucleus only when it is required for nucleus formation, as with predicate adjectives or nominals, or with passive verbs. That is, *be* occurs in these constructions even when there are no operators, e.g. in an infinitive like *Kim wants to be a doctor*. Auxiliaries which function exclusively as operators, e.g. *be* in the progressive or *have* in the perfect, are represented in the operator projection only.

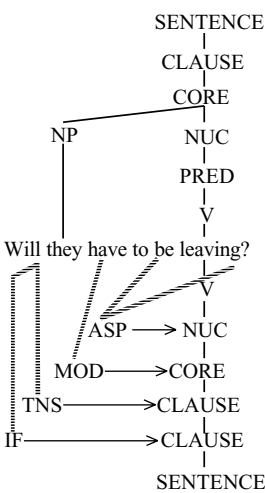


Figure 1.5 English clause structure

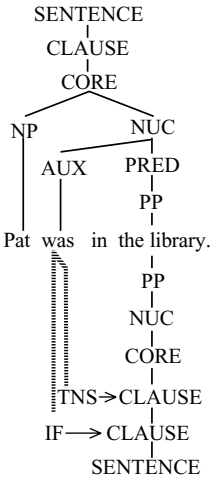


Figure 1.6 English copular construction

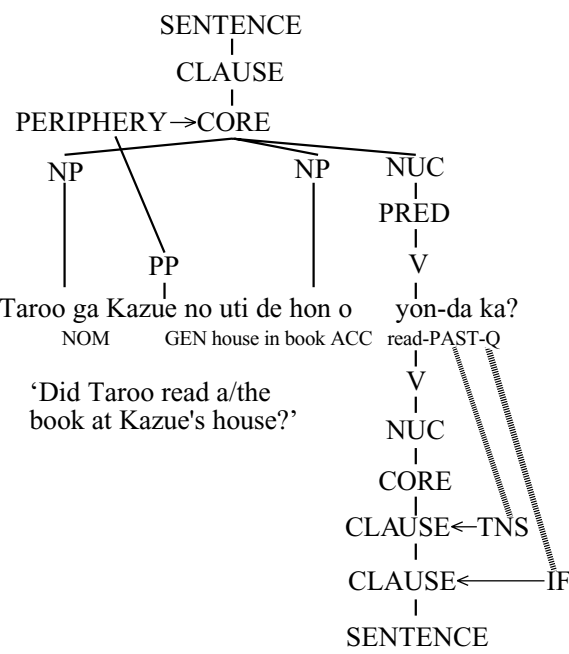


Figure 1.7 Japanese clause structure

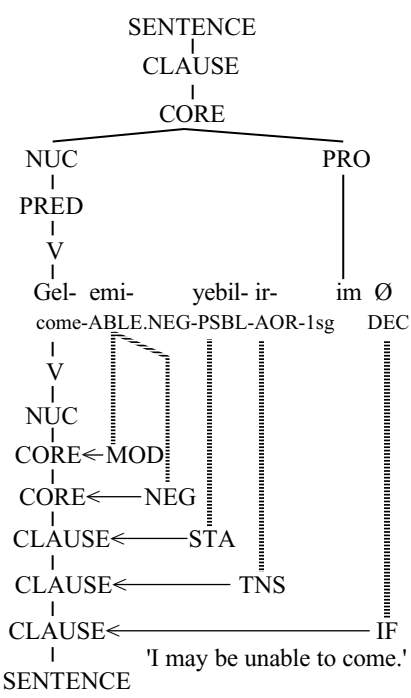


Figure 1.8 Structure of Turkish example in (1.7b)

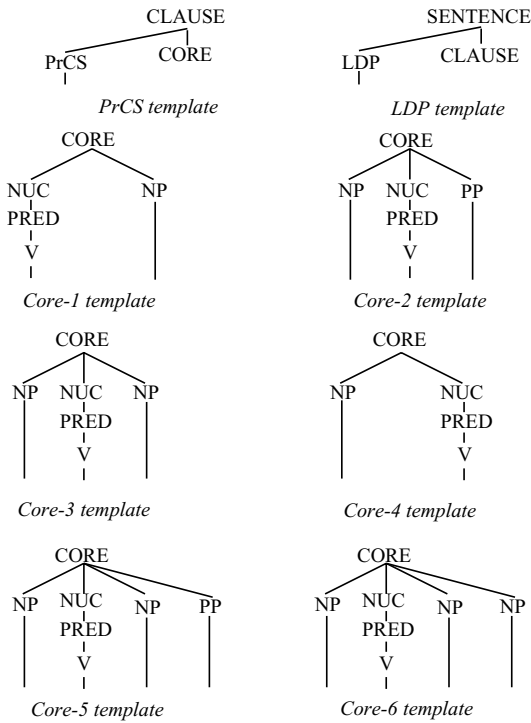


Figure 1.9 English syntactic templates (simplified) from the syntactic inventory

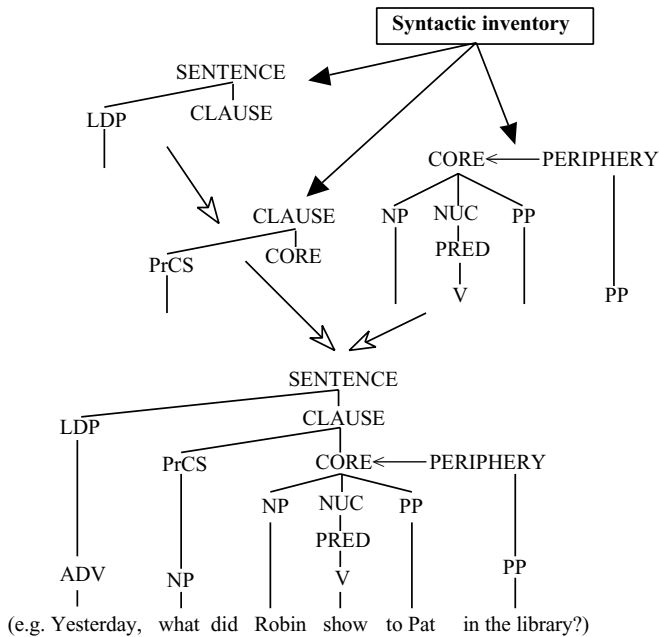


Figure 1.10 Combining syntactic templates from the syntactic inventory

The principles which determine the selection of the syntactic template(s) for a sentence will be introduced in chapter 5.

## 1.4 Clause structure in dependent-marking and head-marking languages

Nichols (1986) proposes a fundamental typological contrast with respect to the way the syntactic relationship between a head and its dependents is signalled morphologically. In languages like English, Dyirbal, Russian and Japanese, the relationship between a verb and the argument(s) it governs is indicated on the dependent arguments in the form of case or adpositional marking. This is illustrated in the Russian example in (1.13).

- (1.13) Molod-aja učitel'nic-a da-l-a nov-uju knig-u  
 young-FsgNOM teacher-FsgNOM give-PAST-Fsg new-FsgACC book-FsgACC  
 star-oj ženščin-e.  
 old-FsgDAT woman-FsgDAT  
 'The young teacher gave a/the new book to an/the old woman.'

The relationship of each of the NPs in the sentence to the verb is expressed by its case: the subject, 'the young teacher', is in the nominative case; the direct object, 'a new book', is in the accusative case; and the indirect object, 'the old woman', is in the dative case. In Tzotzil, on the other hand, this relationship is marked on the head, the verb; in (1.4a) there is no marking on the dependent NPs to indicate their relationship with respect to the verb, but the verb, the governing head, carries morphemes which indicate the person and number of its arguments. Nichols labels languages in which the first pattern predominates (e.g. Russian and Japanese) 'dependent-marking' languages and those in which the second pattern is primary (e.g. Tzotzil) 'head-marking' languages.

This contrast has important syntactic consequences. Because in the head-marking pattern the head bears morphemes which indicate its governed dependents, the dependents can be omitted without affecting the grammaticality of the phrasal unit; the head alone can count as the whole unit. Thus in Tzotzil the NPs in (1.4a) can be freely omitted, and the result is a clause composed of only the verb with its argument-indexing affixes. This is illustrated in (1.14), from Aissen (1987).

- (1.14) a. ?i-Ø-s-pet                      lokeł ?antz ti tul-e.  
 ASP-3ABS-3ERG-carry away woman DEF rabbit-DEF  
 'The rabbit carried away the woman.'
- b. ?i-Ø-s-pet.  
 ASP-3ABS-3ERG-carry  
 'He/she carried him/her/it.'
- c. L-i-s-pet-otik.  
 ASP-1ABS-3ERG-carry-1plINCL  
 'He/she carried us (inclusive).'



The same pattern holds for other types of phrases. For example, in possessive constructions, the signal of possession is on the possessed NP, the head, rather than on the possessor, the dependent, e.g. Tzotzil *s-malal li ?antz-e* (3ERG-husband the woman-DEF) ‘the woman’s husband’ [lit. ‘her<sub>i</sub>-husband the woman<sub>i</sub>’], and here again the dependent can be omitted, yielding a phrase of the same type composed only of the head, e.g. *s-malal* ‘her husband’. The same cannot be said of the dependent-marking pattern. In English, a finite verb alone cannot constitute a clause (*\*carried*), and if the possessor is dropped from a possessive construction, e.g. *the woman’s husband* → *(the) husband*, the result is grammatical but is no longer a possessive construction, unlike its Tzotzil counterpart.

This contrast has important implications for syntactic theory, as many theories are based primarily, if not exclusively, on the analysis of dependent-marking languages. Since it underlies significant differences in what can count as a possible phrase or clause in the two language types, any descriptively adequate theory of clause structure must be able to capture it. In Van Valin (1977, 1985, 1987) it was argued that with respect to clauses in head-marking languages, *the pronominal affixes on the verb are the core arguments of the clause*, not the optional independent lexical NPs and pronouns. The structures of (1.14a,b) would thus be those in Figure 1.11a,b (the operator projection is omitted). The structure of (1.14a) is given in Figure 1.11a; the sentence and clause contain a single core, which is made up of the nucleus (the verb stem *-pet* ‘carry’) and its two arguments, here manifested by the bound morphemes Ø- ‘3ABS’ and *s-* ‘3ERG’. The aspect prefix *?i-* and the directional operator *lokel* ‘away’ would be part of the operator projection. In addition, there are two independent NPs, which are represented as being outside of the core but inside the clause. The structure of the core is unchanged in Figure 1.11b, representing (1.14b). What is the status of the independent NPs in (1.14a)? Semantically, their function is to further specify the reference of the pronominal arguments, which specify only person (and sometimes number). Syntactically, they are clause-internal and hence are within the scope of the illocutionary force operator; they may therefore be asserted, questioned or denied. They are not in the periphery of the clause, because they are not oblique like peripheral adjuncts. Furthermore, they are not in the postcore slot, because it cannot take more than one NP or PP, and there is never more than one in a clause. They cannot be in the right-detached position, because they can occur in all kinds of matrix and

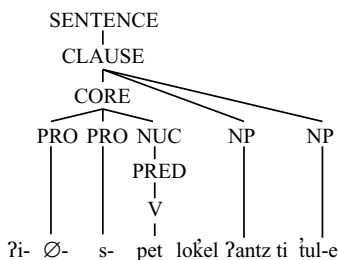


Figure 1.11a Structure of (1.14a)

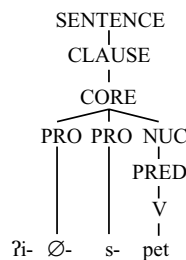


Figure 1.11b Structure of (1.14b)

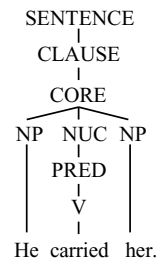


Figure 1.12 English translation of (1.14b)

embedded clauses; the right-detached position is a feature of matrix clauses only. However, as argued in Van Valin (1977, 1985, 1987), these NPs are irrelevant to statements of many grammatical phenomena, because these phenomena make reference primarily to the pronominal affixes.

In Tzotzil, the construal of an NP with an argument affix is a function of word order (the first NP after the verb is interpreted as the absolutive argument, the second as the ergative); changes in the pronominal arguments may require changes in the position of the full NPs. But because the major grammatical processes can apply to NP-less clauses of the kind exemplified in (1.14b), the formulation of these phenomena need not make any reference to independent NPs at all, and consequently statements governing the order of the optional NPs are clearly not central to the working of the grammar. This is in sharp contrast to the situation in languages like English and Russian in which the NPs are the core arguments, and no statement of grammatical phenomena is possible without reference to them.

This difference between head-marking and dependent-marking languages presents an interesting challenge for the principle in (1.1b), but it is in fact satisfied, as a comparison of the structures in Figures 1.11b and 1.12 show: in both, English *he* and Tzotzil *s-* '3ERG' are core arguments, *her* and  $\emptyset$ - '3ABS' are core arguments, and *carry* and *-pet* are the verbs in the nuclei of the respective cores. The primary difference between them is that the core arguments are expressed by bound morphemes in Tzotzil and free morphemes in English. Hence, comparable structures are represented in comparable ways, and this is achieved without making Tzotzil look like English or vice versa.

The contrast between dependent-marking and head-marking languages is not absolute; there are dependent-marking languages with some head-marking features, and there are head-marking languages with some dependent-marking features. Latin, Polish and Croatian, for example, are basically dependent-marking languages, but because they have verb agreement which expresses the person and number of the subject, no independent pronoun is necessary, unlike English. This is illustrated in the following examples from Croatian.

- (1.15) a.    Marij-a            je        kupi-l-a            knjig-u.  
               Maria-FsgNOM be.3sg buy-PAST-Fsg book-FsgACC  
               'Maria bought the book.'
- a'.    Ona            je        kupi-l-a            knjig-u.  
               3FsgNOM be.3sg buy-PAST-Fsg book-FsgACC  
               'She bought the book.'
- a''.    Kupila je knjigu.  
               'She bought the book.'
- b.    Ja            sam    kupi-l-a            knjig-u.  
               1sgNOM be.1sg buy-PAST-Fsg book-FsgACC  
               'I bought the book.' (female speaker)
- b'.    Kupila sam knjigu.  
               'I bought the book.'

Choctaw, a Muskogean language of North America (Heath 1977), exemplifies what Nichols (1986) calls a ‘double-marking language’, i.e. a head-marking language which also has NP case marking. This is illustrated in (1.16).

- (1.16) a. Hattak at Ø-iya-h.  
           man DCT 3SUBJ-go-PRES  
           ‘The man goes.’  
       a’. Ø-iya-h.  
           ‘He/she goes.’  
       b. Hattak at oho:yoh (ã:) Ø-Ø-pi:sa-h.  
           man DCT woman (OBL) 3SUBJ-3OBJ-see-PRES  
           ‘The man sees the woman.’  
       b’. Ø-Ø-pi:sa-h.  
           ‘He/she sees him/her.’

Choctaw, like Tzotzil, cross-references subject and object on the verb, but, unlike Tzotzil, it has case marking for independent NPs. There are only two cases, which Heath (1977) labels ‘direct’ and ‘oblique’; the subject receives the direct case, while non-subject core arguments receive the oblique case. Since Choctaw is basically head-marking, it would be assigned the same clause structures as Tzotzil, with the independent NPs outside the core but inside the clause. In Croatian, on the other hand, sentences like (1.15a) would be analysed as a purely dependent-marking structure with subject agreement, just like English and Icelandic, but in the structural representation of (a'') the subject would be the bound marker on the verb, while the object would be the independent case-marked NP. This yields a mixed representation, with the subject coded morphologically and the object syntactically. This is not unexpected, however, given that Croatian is a dependent-marking language with a head-marking feature in its grammar.<sup>4</sup>

## 1.5 Adjuncts and the periphery

When the layered structure of the clause was introduced in section 1.1, the distinction between the core and the periphery was based on the distinction between arguments and non-arguments. There are two types of non-arguments or adjuncts, phrasal adjuncts such as PPs and non-phrasal adjuncts such as adverbs. PP adjuncts modify the core when they express locational or temporal features of the state of affairs coded by the core. Consequently, the periphery containing them is a core modifier. Some adverbs modify the core as well, e.g. temporal adverbs like *yesterday*, and they too occur in the periphery, as in Figure 1.3. Adverbs may in fact modify all three layers of the clause; aspectual adverbs like *completely* and *continuously* modify the nucleus, pace adverbs like *quickly* and manner adverbs like *carefully* modify the core, and epistemic adverbs like *probably* and evidential adverbs like *evidently* modify the clause. Adverbs are not operators, however, but

<sup>4</sup> See Belloro (2004) for an analysis of clause structure in languages like Spanish in which clitic pronouns function as arguments under certain conditions.

they do interact with operators. Manner adverbs interact in an important way with the tense operator; those which occur before the tense operator can be construed as clausal modifiers, while those occurring after tense cannot be, as McConnell-Ginet (1982) has pointed out. This is illustrated in (1.17).

- (1.17) a. Ruth cleverly hid the cash.  
       b. Ruth hid the cash cleverly.  
       c. Cleverly, Ruth hid the cash.

The first sentence is ambiguous between two readings; the first is that the manner in which she hid the cash was clever (= (1.17b)), and the second is that the fact that she hid the cash was clever (= (1.17c)). The other two sentences are each unambiguous.

When there are multiple adverbs in a sentence, they are constrained by the layered structure of the clause, in that adverbs related to more outer operators occur outside of adverbs related to more inner operators. In the simplest case, 'outside of' means 'farther from the verb'. This is illustrated below; ordering constraints of this kind were first noticed by Jackendoff (1972).

- (1.18) a. Evidently, Leslie has slowly been completely immersing herself in the new language.  
       a'. Leslie has evidently been slowly immersing herself completely in the new language.  
       b. *evidently* [evidential: clausal] > *slowly* [pace: core] > *completely* [aspectual: nuclear]  
       c. \*Evidently, Leslie has completely been slowly immersing herself in the new language.  
       d. \*Slowly, Leslie has evidently been completely immersing herself in the new language.  
       e. \*Slowly, Leslie has completely been evidently immersing herself in the new language.  
       f. \*Completely, Leslie has evidently been slowly immersing herself in the new language.  
       g. \*Completely, Leslie has slowly been evidently immersing herself in the new language.
- (1.19) a. Leslie has been immersing herself completely in the new language slowly evidently.  
       a'. Leslie has been completely immersing herself slowly in the new language evidently.  
       b. *completely* [aspectual: nuclear] < *slowly* [pace: core] < *evidently* [evidential: clausal]  
       c. \*Leslie has been immersing herself slowly in the new language completely evidently.  
       d. \*Leslie has been immersing herself completely in the new language evidently slowly.  
       e. \*Leslie has been immersing herself evidently in the new language completely slowly.

- f. \*Leslie has been immersing herself slowly in the new language  
evidently completely.
- g. \*Leslie has been immersing herself evidently in the new language  
slowly completely.

Note that unlike operators, which have fixed positions, adverbs may occur either before or after the verb, but in both cases the scope constraints require that the nuclear adverb be closer to the verb than the core adverb, and likewise for the core adverb with respect to the clausal adverb. This makes them unlike PP adjuncts as well, which normally follow the core in English; if a PP adjunct precedes the core, it must be in the precore slot or left-detached position.<sup>5</sup> English does not allow phrasal adjuncts to occur among constituents of the core. In general, in languages without free word order, it is normally the case that phrasal adjuncts (PPs) are subject to much greater restrictions on their privileges of occurrence than non-phrasal adjuncts (adverbs). The original notion of periphery in RRG, as introduced in section 1.2, was motivated by the fact that languages often reserve a special place in the clause for phrasal adjuncts.

If the periphery contains the PP adjuncts and adverbs modifying the core, how are the adverbs that modify the nucleus and clause to be represented? And how are core adverbs which precede the core, e.g. *slowly* in (1.18a'), to be represented? Since there are adjunct modifiers of each layer of the clause, it would seem to follow that there is a periphery for each layer, not just one modifying the core. In simple sentences, adverbs occur in the peripheries modifying the clause and the nucleus; PP adjuncts occur primarily in the periphery modifying the core, but there is a small class of PPs that can occur in the periphery modifying the clause (see (6.25)). It will be shown in chapter 6, moreover, that other types of constituents may occur in the clausal and nuclear peripheries in certain kinds of complex sentences. The structures of (1.18a') and (1.19a) are given in Figures 1.13 and 1.14 on the next page.

The semantic representation of peripheral adjuncts, both PPs and adverbs, will be discussed in sections 2.2 and 6.6.

## 1.6 Adpositional and noun phrase structure

Adpositions come in two basic varieties, predicative and non-predicative.<sup>6</sup> Predicative adpositions function like predicates in that they contribute substantive semantic information to the clause in which they occur, both in terms of their own meaning and the meaning of the argument that they license. A typical example of a predicative adposition would be a peripheral<sub>CORE</sub> locative (setting) preposition. Non-predicative adpositions do not add any substantive

<sup>5</sup> It should be noted, however, that certain adverbs may also occur in the precore slot or left-detached position (see Figure 1.10).

<sup>6</sup> The terminology is taken from Bresnan (1982).



but the choice of locative preposition is not determined by the verb, as (1.20) shows.

(1.20) Kim put the book in / on / next to / behind / on top of / under the box.

In this sentence, the different prepositions contribute an important component of the meaning of the sentence, unlike the preposition *to* with a verb like *give* or *show*, and therefore they must be considered predicative prepositions. PPs like those in (1.20) will be referred to as ‘argument-adjuncts’ in the core. It will be shown in the discussion of reflexivization in section 5.3 that argument-adjuncts behave differently from arguments in crucial ways.

The two types of adposition would be symbolized differently in projection grammar representations of the layered structure of the clause. Since non-predicative adpositions mark core arguments, the phrases in which they occur would be PPs in the core; the adposition would be treated the same as a case marker, and in particular it would not be considered the head of the phrase. Predicative adpositions, on the other hand, are the head and nucleus of the phrase in which they occur, and their object is in fact their single argument. The internal structures of an argument (non-predicative) PP and a predicative PP are given in Figure 1.15. Figure 1.15b presents the typical structure of a predicative adpositional phrase in a dependent-marking language. Argument-adjuncts have the internal structure of a predicative PP (Figure 1.15b) but occur in the core.

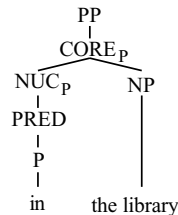
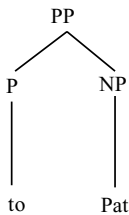


Figure 1.15a *English non-predicative PP*    Figure 1.15b *English predicative PP*

The structure is different in a head-marking language like Yagua (Payne and Payne 1989), in which the adpositional head bears a morpheme expressing its argument (object), e.g. *rá-viimú jümüñú* (3INAN-inside canoe) ‘inside the canoe’ [lit. ‘inside-it; canoe;’]. As with the other head-marking constructions, the dependent can be omitted, with the result being a grammatical phrase of the same type, e.g. *rá-viimú* ‘inside it’. The structure of this example is given in Figure 1.16.

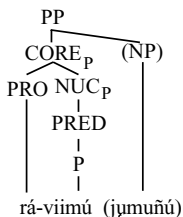


Figure 1.16 *Yagua predicative PP ‘inside the canoe’*

Table 1.3 *Operators in the layered structure of the NP*

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Nuclear <sub>N</sub> operator:
Nominal aspect (count–mass distinction, classifiers in classifier languages)
Core <sub>N</sub> operators:
Number
Quantification (quantifiers)
Negation
NP operators:
Definiteness
Deixis

---

It has long been noted that there are fundamental similarities in the structure of NPs and clauses, especially when the NPs are complex derived nominals, e.g. *Gödel’s proof of the theorem* vs *Gödel proved the theorem*. The primary correspondence between NPs and clauses in RRG is that both have a layered structure and in both there are operators modifying the layers. In the layered structure of the NP, there is a nominal nucleus and a nominal core consisting of the nucleus and the arguments of a complex derived nominal, e.g. *the construction of the bridge by the Mafia-controlled company*, but there is only one level, the NP level, corresponding to the clause and sentence levels of the layered structure of the clause. As with the clause, there is a periphery for each level.

The operators in the NP are given in Table 1.3, adapted from Rijkhoff (2002). Nominal aspect concerns whether the referent is an individual, parts of an individual, a set of individuals, or a kind; see Jackendoff (1990) for discussion of parallels between the mass/count distinction in NPs and the telic/atelic distinction in verbs. Core<sub>N</sub> operators are about quantity, while NP-level operators ground the NP in discourse, analogous to the function of some of the clause-level operators in the clause, especially tense and illocutionary force.

A preliminary general schema for the layered structure of the noun phrase is given in Figure 1.17. It follows the layered structure of the clause in having distinct projections for constituents and operators. Syntactic templates for NPs and PPs would be stored in the syntactic inventory, along with the core and other templates discussed in section 1.3. The projection grammar representation of the layered structure of the noun phrase of two English NPs is given in Figure 1.18. The initial *the* is not attached to anything in the constituent projection, and that reflects its status as one of the NP operators. Operators in the NP follow the same iconic ordering constraint as operators within the clause (Rijkhoff 1990, 2002). Each of the NPs in the complex derived nominal in Figure 1.18 would be given a double projection representation in a complete representation.

As in the clause, there are peripheries modifying all three levels. Since the primary function of nuclear<sub>N</sub> operators is restrictive modification, it is reasonable to suppose that the nuclear<sub>N</sub> periphery would contain adjunct restrictive modifiers,



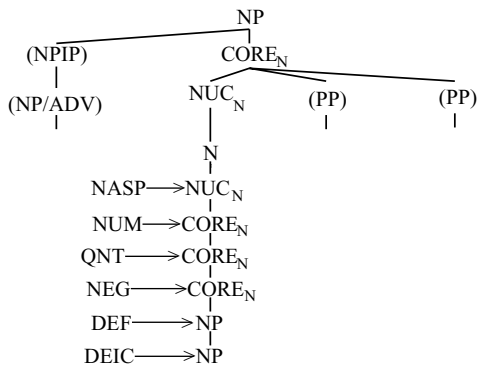


Figure 1.17 *The layered structure of the NP (preliminary)*

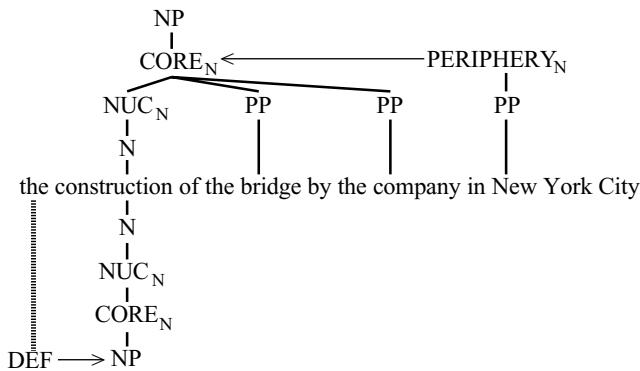
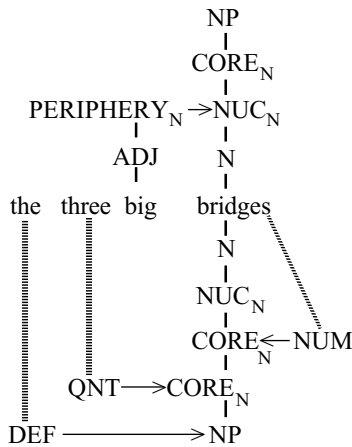


Figure 1.18 *The layered structure of the NP in English*

e.g. adjectives and nominal modifiers, and restrictive relative clauses (see section 6.8). Non-restrictive modifiers, on the other hand, would occur in the NP-level periphery (see Figure 6.29). The constituents of the  $\text{core}_N$  periphery would be the adjunct setting PPs and adverbials of complex event expressions, as in Figure 1.18; this is analogous to their location in the layered structure of the clause.

In earlier work in RRG, adjectives were taken to be  $\text{nuclear}_N$  operators, but as pointed out by Jeruen Dery (contribution to RRG discussion list), adjectives would be the only lexical category functioning as an operator in either the clause or the NP. Otherwise, operators are grammatical (functional) rather than lexical categories. Hence adjectives are best treated on the analogy of adverbs in the clause: they are constituents of the ( $\text{nuclear}_N$ ) periphery whose position is constrained by the iconicity principle – they must occur closer to the nominal nucleus than  $\text{core}_N$ - and NP-level operators and modifiers. It was shown in the previous section that the position of adverbs in a clause is constrained by the operator projection and the iconicity principle regarding operator morphemes and their scope; adjectives are similarly restricted in the NP.<sup>7</sup>

One of the major parallels between NPs and clauses posited by Chomsky (1970) and Jackendoff (1977) is that both have structurally defined subject positions, and this particular similarity is specifically denied in the RRG account. There are two main reasons for this. First, Comrie and Thompson (1985) show that virtually no other languages allow double genitives analogous to the English ones, e.g. *the company's construction of the bridge*, and therefore it is highly inappropriate to base a universal theory of NP structure on a construction which is found in only a single language. In the RRG analysis, the form in Figure 1.18 is posited as the unmarked form for a complex derived nominal. Second, there is considerable evidence within English that the NP in this position is not analogous to a subject in a clause. Nunes (1993) argues that the preposed possessor position is actually functionally similar to the left-detached position in a clause. One piece of evidence for this comes from the fact that non-arguments which cannot be subject in a clause can occur in the preposed possessor position, e.g. *Yesterday's destruction of the city by a hurricane*. It also functions similarly to the precore slot, as WH-words can occur in it as well, e.g. *which proof of the theorem*. This position will be labeled the 'NP-initial position' [NPIP] in the NP, and it plays a role in both projections in English at least, as it also marks the definiteness of the NP. In other languages, e.g. Portuguese, Lakhota and Swahili, an article and a possessor phrase may both occur, in which case the NP-initial position is part of the constituent projection only (cf. Haspelmath 1999). A simplified example of an English NP with an NP-initial position is given in Figure 1.19. Possessive pronouns occur in the NP-initial position in English,

<sup>7</sup> Another way of expressing this contrast is that operators are closed-class items, not open-class. Matasović (2001) argues that in some languages adjectives are a limited, closed class, and furthermore that attributive adjectives may not head phrases. Hence it may be the case that in some languages attributive adjectives are in fact best treated as a nuclear operator, while in others they should be treated as an  $\text{ad-nuclear}_N$  adjunct modifier, as in Figure 1.18.

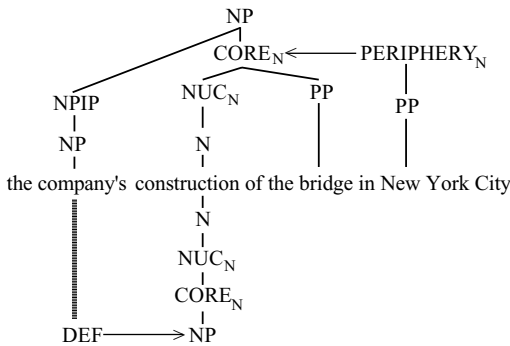


Figure 1.19 *The layered structure of the NP in English with NP-initial position*

as do demonstratives in languages in which they are a subtype of pronoun, as in English. In Lakhota the demonstrative occurs as the last element in the NP (default), and therefore there must be a position analogous to the NP-initial position for it to occur in; it will be termed the ‘NP-final position’ [NPFP]. The English NP *this book* and its Lakhota counterpart, *wówapi ki lé* [book the this], are given in Figure 1.20; the English demonstrative *this* occurs in the NP-initial position in (a), while the Lakhota demonstrative *lé* occurs in the NP-final position in (b). In languages in which demonstratives are non-pronominal and cannot head NPs on their own, they would not be in the NP-initial position or NP-final position; they would be represented solely in the operator projection akin to articles. Possessors receive variable treatment cross-linguistically, ranging from constituents in the NPIP, as in English, to being treated as a special subclass of adjectives, e.g. in Croatian, in which an expression like ‘Ivan’s book’ would not be expressed as a genitive construction (*kniga Ivan-a* [book Ivan-GEN]) but rather as *Ivanova kniga*, in which the possessor is a derived adjective. The existence of the NP-final position, as the rightward counterpart of the NP-initial position, provides another parallel between the layered structure of the clause and layered structure of the noun phrase: both have pre- and post-core positions (left-detached position, pre-core slot, right-detached position, postcore slot in clauses and NP-initial position, NP-final position in NPs).

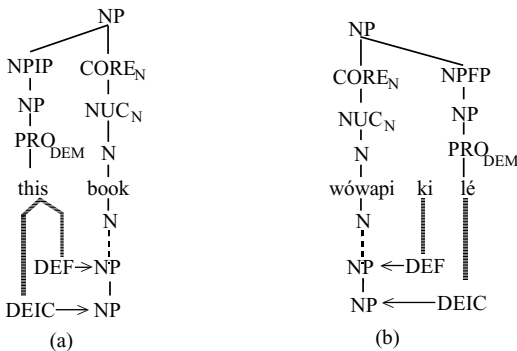


Figure 1.20 *Demonstratives in English and Lakhota*

An important attribute of the layered structure of the clause is that the fundamental unit, the nucleus, is not tied to any specific lexical or syntactic category: the predicate in the nucleus can be a verb, an adjective, a noun phrase or a prepositional phrase, and in complex sentences it can be much more (see Everett 2002). This discussion has assumed that the referring expressions that serve as the arguments of a predicate are properly characterized as ‘noun phrases’, but in fact the referring phrases are, like clauses, not necessarily of one particular lexical or syntactic category. This can be illustrated by the following much-discussed examples from Nootka (Swadesh 1939).

- (1.21) a.    Waʔa:k-ma    qo:ʔas-ʔi.  
               go-3sgPRES man-the  
               ‘The man is going.’  
       a'.    Qo:ʔas-ma    waʔa:k-ʔi.  
               man-3sgPRES go-the  
               ‘The one going is a man.’  
       a''.    Qo:ʔas-ma.  
               man-3sgPRES  
               ‘He is a man.’  
       b.    ʔi:h-ma    qo:ʔas-ʔi.  
               large-3sgPRES man-the  
               ‘The man is large.’  
       b'.    Qo:ʔas-ma    ʔi:h-ʔi.  
               man-3sgPRES big-the  
               ‘The large one is a man.’

The nucleus of the clause in these examples is a verb in (1.21a), a noun in (1.21a',a'',b'), and what appears to be an adjective in (1.21b). The nucleus of the single referring expression is a noun in (1.21a,b), a verb in (1.21a'), and an adjective in (1.21b'). Hence, in at least some languages, the elements that can serve as the nucleus of a referring expression are categorially varied, just like the elements that can function as the nucleus of the clause are. This suggests strongly that ‘NP’ is not the appropriate label for the referring expressions in the constituent projection of the clause; rather, something like ‘RP’ for ‘referential phrase’ would be more appropriate, with the nucleus canonically but not necessarily filled by a nominal element. For the remainder of this book, the traditional label ‘NP’ will be used for referential phrases headed by nominals, and it will be left for future work to develop the notion of RP and its layered structure.

The theory of the layered structure of the noun phrase makes it possible for a monostratal theory like RRG to handle a very interesting phenomenon in some languages, namely free word order with discontinuous constituents. It is exemplified in (1.22) by an example from Dyirbal; all of the variant forms of this sentence mean the same thing, ‘the man speared the wallaby in the mountains’.

- (1.22) a.    Bayi        bargan        ba-ŋgu-l    yaʔa-ŋgu    ɖurɖa-ŋu    gambi-ʔa.  
               DET.ABS wallaby-ABS DET.ERG man-ERG spear-TNS mountains-LOC  
               ‘The man speared the wallaby in the mountains.’

- b. Bangul gambiṭa yaṭangu bayi ḍurganu bargan.  
 DET.ERG mountains man.ERG DET.ABS speared wallaby.ABS
- c. Yaṭangu ḍurganu gambiṭa bargan bangul bayi.  
 man.ERG speared mountains wallaby.ABS DET.ERG DET.ABS
- [All possible orders are grammatical.]

In Dyirbal and many other Australian languages, not only is the order of the NPs and verb in a sentence grammatically unconstrained, as illustrated in (1.2), but the elements constituting an NP need not occur adjacent to each other, as (1.22b,c) show. It would appear that it would be very difficult to meet the principle in (1.1b) in a comparison of Dyirbal and English, for example. But in fact the projection grammar representation of RRG makes it possible to satisfy this principle. The structures of (1.22b) and its English translation are given in Figures 1.21 and 1.22.

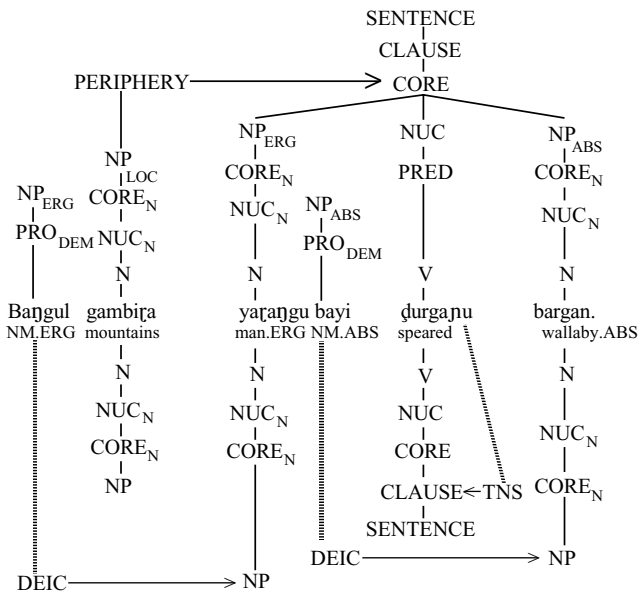
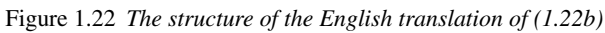


Figure 1.21 The structure of the Dyirbal sentence in (1.22b)

Despite the manifest morphosyntactic differences between the two languages, the comparable structures in each sentence are represented in comparable ways: *yaṭangu* and *man* head NPs functioning as core arguments, as do *bargan* and *wallaby*; *ḍurganu* and *speared* are verbs functioning as nuclei; and *gambiṭa* and *in the mountains* function as locative adjuncts. Moreover, in the NPs headed by *yaṭangu*, *man*, *bargan* and *wallaby* there is a determiner which modifies it at the NP-level. The main differences between them lie in two areas: an adjacency condition on NP constituents, which English (along with the vast majority of languages) has but Dyirbal lacks, and grammatical constraints on NP and verb order, which English has and Dyirbal lacks. Hence, the principle in (1.1b) is satisfied, and, as in the comparison of Tzotzil and English in Figure 1.11, this is achieved without making one of the languages look like the other. Thus, the RRG



<sup>8</sup> Interestingly, Sapir (1921) seems to have recognized the importance of syntactic templates, which he called ‘sentence-ground-works’:

The point that we are really making here is that underlying the finished sentence is a living sentence type, of fixed normal characteristics. These fixed types or actual sentence-ground-works may be freely overlaid by such additional matter as the speaker or writer cares to put on, but they are themselves as rigidly 'given' by tradition as are the radical and grammatical elements abstracted from the finished word. New words may be consciously created on the analogy of old ones, but hardly new types of words. In the same way, new sentences are constantly being created but always on strictly traditional lines. (1921:37)

## 2 Lexical representation and semantic roles

### 2.0 General considerations

The next step in the exploration of the syntax, semantics and pragmatics interface is the characterization of the semantic representation of sentences (see Figure 1 in the Introduction). It is based on the semantic representation of the verb or predicator element. Hence much of the discussion in this chapter will be focussed on the lexical representation of verbs, with some limited discussion of the semantic representation of nominals and operators. An equally important facet of the semantic representation of sentences is the semantic relationships which hold between a verb or other predicator and its arguments.

The lexicon has become a major component of most contemporary syntactic theories; it is no longer ‘an appendix of the grammar, a list of basic irregularities’ (Bloomfield 1933:274). Grammatical generalizations may be stated both in the syntax and in the lexicon, and therefore the system of lexical representation that a theory uses has a profound effect on the type and nature of the generalizations that may be stated in terms of it.

### 2.1 Verb classes and logical structures

Underlying any system of lexical representation for verbs and other predicators, implicitly or explicitly, is a theory of verb classes.<sup>1</sup> RRG starts from the Vendler (1967) *Aktionsart*-based classification of verbs into states, achievements, accomplishments and activities, and utilizes a modified version of the representational scheme proposed in Dowty (1979) to capture these distinctions.

<sup>1</sup> The classification of verbs and the system of lexical representation presented in this section, despite similar terminology, differ in crucial ways from the ones used in Foley and Van Valin (1984), Van Valin (1990, 1991, 1993b) and other work in RRG prior to the publication of Van Valin and LaPolla (1997). See n. 8. Readers should keep this in mind when looking at those earlier works.

### 2.1.1 Verb classes and *Aktionsart*

Examples of English verbs from each of the *Aktionsart* classes are given in (2.1).

- (2.1) a. States: *be sick, be tall, be dead, love, know, believe*
- b. Achievements: *pop, explode, shatter* (the intransitive versions)
- c. Accomplishments: *melt, freeze, dry* (the intransitive versions); *learn*
- d. Activities: *march, walk, roll* (the intransitive versions); *swim, think, snow, write, drink*

States depict static situations which are inherently temporally unbounded (atelic), and both achievements and accomplishments express changes of state, which are inherently temporally bounded (telic): achievements are instantaneous, while accomplishments are not. Activities are dynamic, inherently temporally unbounded (atelic), states of affairs. Vendler proposed this taxonomy based solely on the analysis of English verbs, and yet it has proved to be of great cross-linguistic validity. Investigations of the following languages have shown that these contrasts are central to the organization of their verbal systems: Lakhota (Foley and Van Valin 1984), Tagalog (Foley and Van Valin 1984), Hausa (Abdoulaye 1992), Sama (Philippines; Walton 1986), Yatye (Kwa, Nigeria; Foley and Van Valin 1984; Stahlke 1970), Tepehua (Totonacan, Mexico; Watters 1988), Italian (Centineo 1996), Georgian (Holisky 1979, 1981a, b), Icelandic (Van Valin 1991), Croatian (Dahm-Draksic 1997), Korean (Yang 1994), Japanese (Hasegawa 1996; Toratani 1998), Mparntwe Arrernte (Australia; Wilkins 1989) and Bribri (Chibchan, Costa Rica; Tomcsányi 1988). These distinctions are also highly relevant to language acquisition (Weist *et al.* 2004). It would be reasonable to hypothesize that these distinctions are the universal basis of the organization of verbal systems in human language.

There is one important non-Vendlerian *Aktionsart* class, namely semelfactives (Smith 1997). Semelfactives are punctual events which have no result state. Examples are given in (2.2).

- (2.2) a. The light flashed.
- b. Chris coughed.
- c. The tree branch tapped on the window.
- d. Dana glimpsed Kim.

There is a derivational relation between two classes which is very important cross-linguistically, namely that between activities and what are called ACTIVE ACCOMPLISHMENTS, the telic use of activity verbs. This general pattern relates activity verbs of motion (e.g. *run*), consumption (e.g. *eat*) and creation (e.g. *paint*) to the corresponding active accomplishment verbs. This is illustrated in (2.3) for English.



- (2.3) a. The soldiers marched in the park. Activity  
 a'. The soldiers marched to the park. Active accomplishment  
 b. Dana ate fish. Activity  
 b'. Dana ate the fish. Active accomplishment<sup>2</sup>  
 c. Leslie painted (for several hours). Activity  
 c'. Leslie painted Mary's portrait. Active accomplishment

There are a few verbs in English that are lexical active accomplishments, e.g. *devour* and *go*; that is, they do not alternate with an activity counterpart like the verbs in (2.3).

These classes can be characterized in terms of four features, [ $\pm$  static], [ $\pm$  dynamic], [ $\pm$  telic] and [ $\pm$  punctual].

- (2.4) a. State: [+ static], [– dynamic], [– telic], [– punctual]  
 b. Activity: [– static], [+ dynamic], [– telic], [– punctual]  
 c. Achievement: [– static], [– dynamic], [+ telic], [+ punctual]  
 d. Semelfactive: [– static], [ $\pm$  dynamic], [– telic], [+ punctual]  
 e. Accomplishment: [– static], [– dynamic], [+ telic], [– punctual]  
 f. Active accomplishment: [– static], [+ dynamic], [+ telic], [– punctual]

Most fundamental is the distinction between static and non-static verbs, which distinguishes verbs which code a ‘happening’ from those which code a ‘non-happening’. In other words, with reference to some state of affairs, one could ask, ‘what happened?’ or ‘what is happening?’ If, for example, a sentence like *Bob just ran out the door* could be the answer to this question, then the verb *run* is [– static]. On the other hand, a sentence like *John knows Bill well* could not be the answer to this question, because nothing is taking place. Hence *know* is a [+ static] verb. By this criterion activities, achievements, semelfactives, accomplishments and active accomplishments are [– static]. States, however, are [+ static].

The feature ‘dynamic’ refers to whether the situation involves action or not. Activities and active accomplishments both involve action, as indicated by the fact that these verbs can be modified by adverbs like *violently*, *vigorously*, *actively*, *strongly* and *energetically*. States, achievements and accomplishments are non-dynamic and do not occur with adverbs like these. Some semelfactive verbs do seem to be dynamic, e.g. *cough* as in *He coughed once violently*, while others do not, e.g. *glimpse* as in *\*He glimpsed the robber strongly*.

The feature ‘telic’ has to do with whether a verb depicts a state of affairs with an inherent terminal point or not. States and activities lack inherent terminal points. For example, a sentence like *Chris is smart* makes no reference to a temporal

<sup>2</sup> It should be noted that this contrast *cannot* be reduced to the presence or absence of articles, as claimed in, e.g., Verkuyl (1993), because it occurs in languages which do not have articles, e.g. Georgian, Japanese, Pirahã (Everett 1986) (see Van Valin and LaPolla 1997, section 3.2.1). This contrast revolves around whether the direct object is a specified entity or quantity, in which case it delimits the action and supplies a temporal boundary for it, or whether it is unspecified and therefore does not serve to delimit the action. See Dowty (1979:60ff.) and Jackendoff (1996) for a detailed explication of the semantic basis of these contrasts.

boundary, and is therefore non-telic (atelic). In *The earth is orbiting around the sun*, for example, there is a reference to an activity, but orbiting need not terminate. This is not a function of the progressive aspect; in *the snow is melting on the driveway*, the verb *melt* entails that there is a terminal point at which the snow will be melted. Therefore, *orbit* is [– telic], while the intransitive verb *melt* is [+ telic]. Active accomplishments are telic: in *Dana ate the sandwich*, there is an inherent terminal point, namely the point at which the sandwich is completely consumed. Similarly, in *Pat walked to the park*, the inherent endpoint is when Pat arrives at the park. Achievements also have terminal points; if a bomb explodes or a window shatters, the terminal point is the moment of the explosion or the shattering. An achievement is a transition between one state of affairs (the bomb is unexploded, the window is whole) and a new state of affairs (the bomb is exploded, the window is shattered). Hence these verbs are [+ telic] as well. Semelfactives, on the other hand, are pure events with no transition between one state and the next. In, e.g. *The light flashed once*, the light is in exactly the same state after the event as it was before it; there is no change of state, as with an achievement, hence no transition. Consequently, they are considered to be [– telic]. Therefore, states, activities and semelfactives are unbounded (atelic), while achievements, accomplishments and active accomplishments are bounded (telic).

The final feature, [ $\pm$  punctual], distinguishes events with internal duration from those which lack it. The verbs *melt* and *pop* can both involve changes of state, as in *the ice melted* and *the balloon popped*, but they differ in that the former takes place over a time span, while the latter is instantaneous, for all practical purposes. Hence achievements are punctual, while accomplishments are not. Semelfactives are also punctual, since they denote events without much temporal duration. Since states and activities are atelic, they must by definition involve temporal duration, and therefore they are always [– punctual].

Each of these six classes has a causative counterpart, as exemplified in (2.5).

- |          |                                  |  |
|----------|----------------------------------|--|
| (2.5) a. | State:                           | The boy is afraid.                             |
| a'.      | Causative state:                 | The dog frightens/scares the boy.              |
| b.       | Achievement:                     | The balloon popped.                            |
| b'.      | Causative achievement:           | The cat popped the balloon.                    |
| c.       | Semelfactive                     | The pencil tapped on the table.                |
| c'.      | Causative semelfactive           | The teacher tapped the pencil on the table.    |
| d.       | Accomplishment:                  | The ice melted.                                |
| d'.      | Causative accomplishment:        | The hot water melted the ice.                  |
| e.       | Activity:                        | The soldiers marched in the park.              |
| e'.      | Causative activity:              | The sergeant marched the soldiers in the park. |
| f.       | Active accomplishment:           | The soldiers marched to the park.              |
| f'.      | Causative active accomplishment: | The sergeant marched the soldiers to the park. |

There are a number of syntactic and semantic tests for determining the class of a verb. A list of possible tests for the verb class are given in Table 2.1; the causative classes will be discussed below. The ‘\*’ means that certain complications arise with this test, which will be discussed below. It should be noted that it is necessary

Table 2.1 *Tests for Aktionsart classes*

Criterion	State	Achiev	Seml	Accomp	Activity	Active Accomp
1. Occurs with progressive	No*	No*	No*	Yes	Yes	Yes
2. Occurs with adverbs like <i>vigorously</i> , <i>actively</i> , etc.	No	No	Some*	No	Yes	Yes
3. Occurs with adverbs like <i>quickly</i> , <i>slowly</i> , etc.	No	No*	No*	Yes	Yes	Yes
4. Occurs with <i>X for an hour</i> , <i>spend an hour</i> , <i>Xing</i>	Yes*	No*	Yes*	Irrelevant*	Yes	Irrelevant*
5. Occurs with <i>X in an hour</i>	No	No*	No*	Yes	No	Yes
6. Can be used as stative modifier	Yes	Yes	No	Yes	No	Yes

to adapt the tests to the features of the language under investigation. For example, one of the tests Dowty (1979) gives to differentiate states from the non-states is 'non-states have a habitual interpretation in simple present tense', which is clearly an English-specific test.

Test 1 is useful only in languages like English, Turkish and Icelandic which have a progressive aspect; it can occur with activities (2.6d), accomplishments (2.6b), active accomplishments (2.6e), but not with most states<sup>3</sup> (2.6a, a') or achievements with a singular subject (2.6c). When it occurs with semelfactives, it necessarily yields an iterative reading (2.6f); this is also the case when the progressive is added to an achievement with a plural subject.

<sup>3</sup> There is an additional complexity with the progressive test. Some stative predicates, such as *sit*, *stand* and *lie*, may occur with the progressive under certain circumstances, as in (i).

- (i) a. The book is lying on the table.  
 b. The city lies/\*is lying at the base of the mountains.

Carlson (1977) calls the statives in (ia) *stage-level* predicates, because they depict a situation which is not necessarily permanent. When the situation is necessarily permanent, as in (ib), the progressive is impossible. Carlson refers to statives representing permanent states or attributes as *individual-level* predicates.

- (2.6) a. \*Dana is being tall / fat / a doctor.  
 a'. \*Pat is knowing the answer / believing that today is Wednesday.  
 b. The ice is melting.  
 c. \*The firecracker is popping. (cf. The firecrackers are popping.)  
 d. Kim is dancing/singing/running/talking/crying/sleeping.  
 e. Chris is walking to the park.  
 f. The light is flashing (\*once).

This test is marked 'No\*' for semelfactives, because if an adverb like *once* or *one time* is added to make an iterative reading impossible, the progressive is unacceptable. The progressive with a semelfactive verb (or an achievement verb with a plural subject) yields a verb which patterns like an activity verb.

Test 2 involves the ability to co-occur with adverbs that code dynamic action, e.g. *vigorously*, *gently*, *powerfully*, etc. This is a test for the feature [dynamic].

- (2.7) a. \*Max is vigorously tall / fat / a linguist.  
 a'. \*Max vigorously knows the answer / believes that today is Wednesday.  
 b. \*The snow is melting/melted vigorously.  
 b'. \*The window shattered vigorously.  
 c. Mary is dancing/singing/running/talking/crying vigorously/actively.  
 c'. The house is shaking violently/vigorously/forcefully.  
 d. Pat ran energetically to the park.  
 e. Chris coughed once violently.  
 e'. \*Chris caught sight of the intruder forcefully/strongly/energetically.

There is an important caution relevant to this test. It is crucial to be careful to avoid adverbs which require a controlling subject, e.g. *deliberately*, *carefully*. While they are compatible with many types of activity verbs, they are also incompatible with activity verbs which have subjects which refer to non-agentive participants in the action, e.g. *shiver* as in *the dog shivered violently/\*deliberately in the cold*, or *shake* as in *the house shook violently/\*carefully during the earthquake*. Consequently, if such an adverb is acceptable with a verb, then the verb is dynamic, but if it is incompatible with a verb, this may be due to the agentive aspect of these adverbs. Hence it is necessary to also use adverbs which are compatible with involuntary verbs like *shiver* and with verbs like *shake* which can have an inanimate subject. If a language lacks adverbs of this kind, then other kinds of adjunct verbal modifiers can be used, e.g. PPs like *with great force*, *in a vigorous way*, which express the same thing as these adverbs.

Test 3 applies only to non-stative verbs and distinguishes non-punctual from punctual verbs. Adverbs like *quickly*, *rapidly* and *slowly*, which will be called 'pace' adverbs, can occur with events involving temporal duration, regardless of whether they involve dynamic action, e.g. *the snow is melting slowly/?vigorously*, *John slowly/\*vigorously realized his mistake*. The '\*' on the 'No' in the achievement and semelfactive columns indicates that pace adverbs indicating very short temporal intervals are marginally acceptable with these verbs, e.g. *the bomb exploded instantly*, *the light flashed instantly*. Hence with achievement verbs it is necessary to use pace adverbs which indicate a relatively slow process, e.g.

*the bomb exploded \*slowly/\*gradually*. Again, with respect to semelfactive verbs these adverbs are possible only on the iterative reading, and therefore adding *once* should render them unacceptable, e.g. ??*The tree branch tapped slowly on the window once*.

Tests 4 and 5 distinguish telic from non-telic verbs. When applied to other languages, they require one to determine which adposition indicates duration (the *for* test) and which indicates completion (the *in* test). Test 4 isolates the property of having duration in time; it shows that states, accomplishments, activities and active accomplishments all have temporal duration, but achievements do not. Semelfactives can take a *for* PP expressing very short duration, as in (2.8f). Test 5 focuses on terminal points. If something is done *in* ten minutes, then explicit reference is being made to the termination point of the event. In other words, the event started at a certain time and ended ten minutes later. But if something is done *for* ten minutes, the same event could still be going on at a later time. All the *for*-phrase indicates is that an event went on for a certain amount of time, without any information about when it began or when it ended. So in *he read the book in an hour*, the event began and ended in the space of one hour, with the subject having finished reading the book, whereas in *he read the book for an hour*, there is no indication of when the action began or ended, and the same event could still be going on at a later time. In general, states and activities readily take *for*-phrases, while accomplishments take *in*-phrases. Because achievements are punctual, they are only compatible with *in*-phrases referring to an exceedingly short period of time, e.g. *in the blink of an eye*, *in an instant*, *in a fraction of a second*. They are incompatible with *in*-phrases referring to temporal periods longer than this, e.g. *in ten seconds*, *in a minute* and *in an hour*, unless they have an iterative reading, and accordingly they are marked 'No\*' in Table 2.1. Hence this test should also be used with temporal expressions of substantial duration.

- (2.8) a. Max was tired/ill/happy *for/\*in* an hour.  
 a'. Max liked Susan *for/\*in* an hour.  
 b. The snow melted *in/for* an hour.  
 c. The window shattered *in/\*for* a fraction of a second.  
 (\*The window shattered *in* an hour.)  
 d. Mary danced/sang/cried/talked/slept *for/\*in* ten minutes.  
 e. Tom drank the glass of beer *in/\*for* an hour.  
 e'. Tom drank beer *for/\*in* an hour.  
 f. The light flashed once *for/?/?in* an instant.  
 f'. \*The light flashed once *in/for* an hour.

State predicates which code inherent properties do not normally take *for* phrases, e.g. *\*Sandy was tall/thin/short/fat for an hour*. Hence there is an asterisk on the 'Yes' indicating that this test is problematic for some state predicates (cf. n. 3). Some accomplishments and active accomplishments can take *for*-phrases, e.g. *the clothes dried for ten minutes* or *Chris ran to the park for five minutes*, which follows from their being non-punctual, which is the main point

of test 3. Hence the occurrence of *for*-phrases with accomplishments is really redundant and tells us nothing new about accomplishments or active accomplishments. Hence it is marked as 'irrelevant' in Table 2.1 for them. Finally, there is an additional co-occurrence which must be noted. Achievements, semelfactives and activities do co-occur with *in*-phrases, e.g. *The bomb will explode in one hour*, *Mary will sing in ten minutes*; these phrases refer to the time until the onset of the action or event, not to the temporal duration of the event itself and are therefore irrelevant to these tests. Thus, it is not sufficient simply to ascertain the type of temporal phrase that a verb can occur with; it is, rather, necessary to pay attention to the meaning of the sentence as well.

Test 6 serves primarily to distinguish the two punctual types from each other. As noted earlier, semelfactives have no result state, and therefore they cannot be used as stative modifiers, e.g. *\*the tapped window*, *\*the flashed light*. Achievements, on the other hand, do have a result state and therefore can be used as stative modifiers, e.g. *the shattered window*, *the burst blood vessel*. This is related to the fact noted earlier that semelfactives can have an iterative interpretation with a singular subject, while achievements can only have such a reading with a plural subject. Because the subject of an achievement undergoes a change of state, it cannot undergo it again, and therefore a different referent is required for the action to repeat, whereas, because the subject of a semelfactive verb does not undergo a change of state, it can repeat the action, hence the possibility of an iterative reading with a singular subject. This contrast could be used as an additional test for differentiating achievements from semelfactives.

There is no simple syntactic test to determine whether a verb is inherently causative or not, but paraphrases can be useful, as illustrated in (2.9).

- (2.9) a. The dog caused the boy to be afraid.  
 b. The cat caused the balloon to pop.  
 c. The hot water caused the ice to melt.  
 d. The girl caused the ball to bounce around the room.

It is important to make sure that the paraphrases have the same number of NPs as the original sentence being paraphrased; that is, 'Pat causes Chris to come to have the book' is an appropriate paraphrase of *Pat gives the book to Chris*, but 'Leslie causes Leslie/herself to run' is not a possible paraphrase of *Leslie runs* (it is at best a paraphrase of *Leslie made herself run*). This means that this test cannot apply to single argument verbs, i.e. verbs that have one argument in their basic form, because it would be impossible to make a causative paraphrase with a single participant. It must be emphasized that the claim here is not that *The dog scared the boy* and *The dog caused the boy to be afraid* mean exactly the same thing; rather it is that if *The dog scared the boy* is true, then *The dog caused the boy to be afraid* is also true; the converse need not hold.<sup>4</sup> Furthermore, the causative relation intended here is exactly the same one that is signalled by causative morphology

<sup>4</sup> In discussions of verb semantics and paraphrases, it has often been pointed out that there are situations under which *John caused Bill to die* would be true but *John killed Bill* would not be.

in many languages, e.g. Lakhota *inihq* ‘be scared, frightened, amazed, awed’ vs *inihq-ya* (-*ya* ‘cause’) ‘scare, frighten, amaze, awe’; Barai (Papua-New Guinea; Olson 1981) *mae* ‘be happy’, *visi* ‘be sick’, vs *ma-d-* [happy+cause] ‘please’ and *visi-nam-* [sick+cause] ‘sicken’.

Table 2.2 *Tests for determining predicate classes*

Class	Test 1 Prog.	Test 2 Dynamic	Test 3 Duration	Test 4 <i>for</i> -PP	Test 5 <i>in</i> -PP	Test 6 Stat.Mod.	Test 7 Cause
State	No*	No	No	Yes*	No	Yes	No
Achievement	No*	No	No*	No*	No*	Yes	No
Semelfactive	No*	No*	No*	Yes*	No*	No	No
Accomplishment	Yes	No	Yes	Irrelev.*	Yes	Yes	No
Activity	Yes	Yes	Yes	Yes	No	No	No
Active	Yes	Yes	Yes	Irrelev.*	Yes	Yes	No
accomplishment							
Causative state	Yes*	Yes*	No	Yes	No	Yes	Yes
Causative	No	Yes*	No*	No	No*	Yes	Yes
achievement							
Causative	No*	Yes*	No*	No*	No*	No	Yes
semelfactive							
Causative	Yes	Yes*	Yes	Irrelev.*	Yes	Yes	Yes
accomplishment							
Causative activity	Yes	Yes	Yes	Yes	No	Yes	Yes
Causative active	Yes	Yes	Yes	Irrelev.*	Yes	Yes	Yes
accomplishment							

When the causative versions of the classes listed in Table 2.1 are included, the result is given in Table 2.2. The causative paraphrase test is test 7. The ‘\*’ for achievement and causative achievements and semelfactives with respect to tests 3 and 5 is the same as discussed above, as is the ‘\*’ for test 4 with state predicates. Causative states present some interesting complexities with respect to tests 1 and 2. Specifically, the more active the causing state of affairs is, the better the progressive and dynamic adverbs are with causative state predicates. Consider the following contrasts.

- (2.10) a. Your attitude upsets / ?is upsetting me.  
 a'. Your boorish behaviour upsets / is upsetting me.  
 b. Your clothes nauseate / ?are nauseating me.  
 b'. The smell of your clothes nauseates / is nauseating me.  
 c. The clown's funny hair amuses / ?is amusing the children.  
 c'. The clown's zany antics amuse / are amusing the children.

This is correct but irrelevant. The crucial point is that in all circumstances in which *John killed Bill* would be true, *John caused Bill to die* would also be true. This is the paraphrase relation that is essential for this test.

The first sentence in each pair presents a rather static situation as the cause of the state of affairs, while the second presents a more dynamic causing state of affairs. While none of the combinations is impossible, the progressive is better with the more dynamic causing state of affairs and worse with the more static one. Dynamic adverbs also force a dynamic reading for the causing state of affairs. For example, the sentence *the clown actively amused the children* could only be a report about the state of affairs described by (2.10c'), not (2.10c).

The 'Yes\*' for test 2 for causative achievements, semelfactives and accomplishments reflects the fact that this type of adverb is not always acceptable with these verbs. It modifies the causing activity. Because they are sometimes acceptable, causative accomplishments differ little from causative active accomplishments in terms of these tests. But there are important differences. First, there should always be at least some dynamic adverbs compatible with causative active accomplishments, and because there are two activities, the causing activity and the caused activity, there may be ambiguity as to which one is being modified, something which is not the case with causative accomplishments, in which a dynamic adverb could be interpreted only as modifying the causing activity. Second, causative accomplishments are ultimately related to a state predicate, whereas causative active accomplishments are ultimately related to an activity predicate. That is, the non-causative form of a causative accomplishment should be an accomplishment, which should involve a specific result state. The non-causative form of a causative active accomplishment, on the other hand, should be an active accomplishment, which should involve a specific activity. It should also be noted that causative accomplishments are much more common than causative active accomplishments, and therefore in unclear cases it is more likely that the verb would be a causative accomplishment rather than a causative active accomplishment.

These tests are not perfect, but taken together they enable the analyst to distinguish the classes. As noted above, it is necessary to adapt the tests to the language being investigated, and not all of them are equally useful. If a language lacks a progressive aspect, for example, then test 1 is irrelevant. Finally, it is necessary to be sensitive to what may be called 'local co-occurrence effects' in interpreting the tests. For example, suppose one applied test 3 to the English verb *rush*, as in *She rushed across the room*, in order to determine whether this verb has temporal duration or not, yielding *She rushed quickly/swiftly/\*slowly across the room*. Some but not all pace adverbs are possible here; what is one to conclude? The correct conclusion is that *rush* has temporal duration and therefore is either an active accomplishment or activity verb. But what about the incompatibility with *slowly*? This is an example of a local co-occurrence effect; because part of the inherent meaning of *rush* is to do something with some degree of rapidity, *slowly* conflicts with this aspect of the meaning of *rush*. This is not due to the verb not having temporal duration, as its co-occurrence with *quickly* and *swiftly* show. Rather, the incompatibility of *rush* and *slowly* is due to an aspect of the meaning of *rush* which is unrelated to what test 3 is testing for. In the same vein, it is possible that only one of the class of adverbs of the type mentioned in test 2



is compatible with a particular verb; that would be sufficient to show that the verb rates a ‘yes’ for the test. Other factors irrelevant to the point of the test may cause the other adverbs to be ruled out. Thus one must be sensitive to these local co-occurrence effects in interpreting the results of the tests.

In many languages, verbs in these different classes may be overtly morphologically related to each other. Consider the following examples from Huallaga Quechua (Weber 1989).

(2.11)	State	Accomplishment	Causative accomplishment
a.	<i>qarwash-</i> yellow ‘be yellow’	<i>qarwash-ta:-</i> yellow-become ‘become yellow’	<i>qarwash-ta:-chi-</i> yellow-become-cause ‘make something yellow’
b.	<i>hanqa-</i> above.on.slope ‘above with respect to slope’	<i>hanqa-ya:-</i> above.on.slope-become ‘become higher’	<i>hanqa-ya:-chi-</i> above.on.slope-become-cause ‘make something higher’
c.	<i>hatun-</i> big ‘be big’	<i>hatun-ya:-</i> big-become ‘become bigger’	<i>hatun-ya:-chi-</i> big-become-cause ‘make something bigger’
d.	<i>umasapa-</i> big.headed ‘be big-headed’	<i>umasapa-ya:-</i> big.headed-become ‘become big-headed’	<i>umasapa-ya:-chi-</i> big.headed-become-cause ‘make someone big-headed’
e.	—	<i>wañu-</i> die ‘die’	<i>wañu-chi-</i> die-cause ‘kill’
f.	—	<i>yacha-</i> learn ‘learn’	<i>yacha-chi-</i> learn-cause ‘teach’

In (2.11 a–d) accomplishment verbs are formed from state predicates by the addition of the suffix *-ya:-* ‘become’, and causative accomplishments are formed from them by the addition of the causative suffix *-chi-*. As (2.11 e–f) show, *-chi-* can be added to underived accomplishment verbs as well.

A rather different pattern expressing the same relationships obtains in Yagua (Peru; Payne and Payne 1989), Russian and French.

(2.12)	Causative Accomplishment	Accomplishment	State
a.	Yagua <i>-muta-</i> ‘open [TR]’	<i>-muta-y-</i> ‘open [INTR]’	<i>-muta-y-maa</i> ‘be open’
b.	French <i>briser</i> ‘break [TR]’	<i>se briser</i> ‘break [INTR]’	<i>brisé</i> ‘broken’
c.	Russian <i>razbit</i> ‘break [TR]’	<i>razbit’sja</i> ‘break [INTR]’	<i>razbitij</i> ‘broken’

In these three languages, the base form of the verb is a causative accomplishment, and the accomplishment and state forms are derived morphologically from it. This is a very common pattern cross-linguistically; see Haspelmath (1993) for a survey of the morphological patterns exhibited by verbs in this alternation. It is also the case that some languages overtly mark the contrast between activity verbs and active accomplishment verbs, e.g. Russian *est* ‘eat [activity]’ vs *s’est* ‘eat [active accomplishment]’, Georgian *c’er* ‘write [activity]’ vs *dac’er* ‘write

[active accomplishment]'. In all of these languages there are overt morphological relationships among some of the different classes.

### 2.1.2 Logical structures

An explanation for these patterns can be found in the lexical representations used in RRG: verbs are analysed in terms of a lexical decomposition system in which state and activity predicates are taken as basic and the other classes are derived from them. States are represented as bare predicates, e.g. **know'** (x, y), **dead'** (x). Activity verb representations all contain the element **do'**, e.g. **do'** (x, [**cry'** (x)]) 'cry', **do'** (x, [**eat'** (x, (y))]) 'eat'. Achievements, which are punctual changes of state or onsets of activity, are represented as a state or activity predicate plus an INGRessive operator, e.g. INGR **shattered'** (x) 'shatter [INTR]'. English does not have any lexical verbs indicating a punctual onset of an activity, but other languages do. In Russian, *plakat'* 'cry' is an activity verb, and *zaplakat'* 'burst out crying' is an achievement, i.e. INGR **do'** (x, [**cry'** (x)]); note the translation using the punctual expression *burst out*. Semelfactives likewise can be based on states or activities, e.g. *glimpse* would have the representation SEML **see'** (x, y), while *cough* would have the representation SEML **do'** (x, [**cough'** (x)]). This captures the fact that only semelfactives based on activities have an activity reading when iterative, e.g. *Pat is coughing* vs *\*Chris is glimpsing Kim*. This also accounts for their differential behaviour with dynamic adverbs: those based on activities can take such adverbs, e.g. *He coughed once violently*, while those based on states cannot, *\*He glimpsed her vigorously*. Accomplishments, which are non-punctual changes of state or onsets of activity, are represented as a state or activity predicate plus a BECOME operator, e.g. BECOME **melted'** (x) 'melt [INTR]'. Russian also provides an example of a non-punctual onset of activity verb: *govorit'* 'talk, speak' is an activity verb, and *zagovorit'* 'start talking' is an accomplishment, i.e. BECOME **do'** (x, [**speak'** (x)]). Causative verbs have a complex structure consisting of a predicate indicating the causing action or event, usually an activity predicate, linked to a predicate indicating the resulting state of affairs by an operator-connective CAUSE, e.g. [**do'** . . .] CAUSE [BECOME **pred'** . . .].<sup>5</sup>

Accomplishment verbs like *melt* involve both a process that takes place over time, and an inherent endpoint of the process leading to a result state. Achievement

<sup>5</sup> Treating causatives as all having the same 'CAUSE' element is a gross oversimplification for many reasons, only two of which will be mentioned here. First, there is a contrast among three basic types of causality: (i) *Pam made Sally go* [Direct (Coercive)]; (ii) *Pam had Sally go* [Indirect (Non-coercive)]; and (iii) *Pam let Sally go* [Permissive]. Both direct and indirect causality will be represented by 'CAUSE', and permissive causality will be represented by 'LET' in logical structure. English verbs like *let*, *drop* and *release* would have LET instead of CAUSE in their logical structure. Virtually all the examples to be discussed involve direct or indirect causality. Second, there is an important contrast between implicative and non-implicative causality; that is, the difference revolves around whether the resulting state of affairs is necessarily entailed or not. In English, lexical causatives and direct causality are implicative, whereas permissive causality is not: *\*Pam broke the dish, but it didn't break*; *\*Pam made Sally go, but she did not go*; *Pam let Sally go*,

verbs like *pop*, on the other hand, have no process, only a punctual event leading to a result state. Thus, an accomplishment can be analysed as a process plus an achievement, if the final moment of the process is equated with the punctual event of the achievement. There is no direct representation of such a process in this decomposition system. It is not the same as an activity, since it is not dynamic, i.e. such processes do not co-occur with the adverbs of test 2 in Table 2.1. This can be seen in English when verbs like *melt* occur in the progressive, which isolates the process from the endpoint, as in (2.13).

- (2.13) a. The ice is melting.  
b. The ice is melting slowly/\*vigorously.

There are languages in which verbs directly express processes with no necessary implication of an endpoint and result state, unlike English verbs like *melt* and *dry*. The following examples are from Mparntwe Arrernte (Wilkins 1989).

- (2.14) a. Ayenge irrernte ne-ke.  
1sgNOM cold COP-PAST  
'I was cold.'  
b. Ayenge irrernt-irre-ke.  
1sgNOM cold-PROC-PAST  
'I got colder/cooler/\*cold.'  
b'. Ayenge iparrpele/\*tyepetyepele irrernt-irre-ke.  
1sgNOM quickly/energetically cold-PROC-PAST  
'I got colder quickly/\*energetically.'  
c. Ayenge irrernte-arle-irre-ke.  
1sgNOM cold-RES-PROC-PAST  
'I got cold.'

but *she did not go*. In some languages, e.g. Japanese (Ikegami 1985) and Korean (Park 1993), lexical and direct causatives are not implicative. The following examples are from Park (1993).

- (1) a. Chelswu-nun mwul-ul el-li-ess-una, mwul-i an-el-ess-ta.  
-TOP water-ACC freeze-CAUS-PAST-but water-NOM NEG-freeze-PAST-DEC  
'Chelswu froze the water, but the water did not freeze.'  
b. Congi-lul thay-wu-ess-una, ku cong-i-ka an-tha-ess-ta.  
paper-ACC burn-CAUS-PAST-but the paper-NOM NEG-burn-PAST-DEC  
'I burned the paper, but the paper didn't burn.'

In order to make them implicative, the verb *noh* 'put' must be serialized with them, and this creates a contradiction within the sentence frame of (2).

- (2) a. \*Chelswu-nun mwul-ul el-li-e-noh-ess-una, mwul-i  
-TOP water-ACC freeze-CAUS-LNK-put-PAST-but water-NOM  
an-el-ess-ta.  
NEG-freeze-PAST-DEC  
'Chelswu froze the water, but the water did not freeze.'  
b. \*Congi-lul thay-wu-e-noh-ess-una, ku cong-i-ka an-tha-ess-ta.  
paper-ACC burn-CAUS-LNK-put-PAST-but the paper-NOM NEG-burn-PAST-DEC  
'I burned the paper, but the paper didn't burn.'

For discussion of these issues, see, e.g., Jackendoff (1990), Talmy (2000), especially with respect to the latter's theory of force dynamics.

The crucial contrast is between (2.14b) and (c): the suffix *-irre* added to the stative stem *irrernte* ‘cold’ means ‘become colder’ or ‘become cooler’ but not ‘become cold’, i.e. it signals a change from less cold to more cold without entailing that the process has reached the endpoint of being cold. Like (2.13b) in English, a dynamic adverb like *tyepetyepele* ‘energetically’ is impossible with a process. In order to signal the reaching of the endpoint, the suffix *-arle* ‘result’ must be added, as in (c), to indicate that the process reached its termination yielding a result state. Hence in Mparntwe Arrernte it is necessary to represent processes independent of a possible endpoint and result state. In order to do this, it is necessary to introduce an operator PROC for ‘process’. The decompositional representation for the examples in (2.14) would be as in (2.15).

- (2.15) a. **cold'** (1sg) *irrernte*  
 b. PROC **cold'** (1sg) *irrernte + irre*  
 c. PROC **cold'** (1sg) & INGR **cold'** (1sg)<sup>6</sup> *irrernte + arle + irre*

Thus, BECOME with a state predicate is decomposable into PROC & INGR; ‘&’ is a connective meaning ‘and then’ (see Dowty (1979:74–5)). However, it will continue to be used with verbs like English *melt* and *dry*, because they normally entail both a process and a result state.<sup>7</sup> Unlike INGR, SEML and BECOME, PROC does not occur with activity verbs. The other three entail an event or transition which is the onset of the activity, and because PROC has no event or transition entailment, it could not be used to characterize some kind of pre-onset process.

As shown in (2.3), active accomplishments are composed of an activity predicate plus a change of state which renders them telic. There are two kinds of active accomplishments: those involving verbs of motion, as in (2.3a'), and those involving verbs of consumption and creation as in (2.3b',c'). With the first kind, the change is a change of location, namely the motion is completed when the subject arrives at a particular location. Hence the decompositional representation of (2.3a') would be as in (2.16a). With respect to verbs of consumption and creation, on the other hand, the result state is either the consumption or creation of an object, which involves a change of state rather than location. The representations for the examples in (2.3b',c') are given in (2.16b,c).

- (2.16) a. **do'** (soldiers, [**march'** (soldiers)]) & INGR **be-at'** (park, soldiers)  
 b. **do'** (Dana, [**eat'** (Dana, fish)]) & INGR **consumed'** (fish)  
 c. **do'** (Leslie, [**paint'** (Leslie, Mary's portrait)]) & INGR **exist'** (Mary's portrait)

Because active accomplishments are composed of an activity + termination with result state, they are more accurately characterized as ‘active achievements’.

<sup>6</sup> The INGR operator here is not directly signalled by the verbal morphology, which indicates a process plus a result state. But the existence of a result state necessarily entails a change of state leading to the result, hence the INGR.

<sup>7</sup> The effect of the progressive on verbs like this can now be easily expressed: progressive + BECOME **pred'** (x) yields PROC **pred'**. In other words, the progressive cancels the INGR component of BECOME, leaving only PROC. This follows from the incompatibility of the progressive and achievements, as expressed in test 1.

Table 2.3 *Lexical representations for Aktionsart classes*<sup>8</sup>

Aktionsart class	Logical structure
STATE	<b>predicate'</b> (x) or (x, y)
ACTIVITY	<b>do'</b> (x, [ <b>predicate'</b> (x) or (x, y)])
ACHIEVEMENT	INGR <b>predicate'</b> (x) or (x, y), or INGR <b>do'</b> (x, [ <b>predicate'</b> (x) or (x, y)])
SEMELFACTIVE	SEML <b>predicate'</b> (x) or (x, y) SEML <b>do'</b> (x, [ <b>predicate'</b> (x) or (x, y)])
ACCOMPLISHMENT	BECOME <b>predicate'</b> (x) or (x, y), or BECOME <b>do'</b> (x, [ <b>predicate'</b> (x) or (x, y)])
ACTIVE ACCOMPLISHMENT	<b>do'</b> (x, [ <b>predicate'<sub>1</sub>'</b> (x, (y))]) & INGR <b>predicate'<sub>2</sub>'</b> (z, x) or (y)
CAUSATIVE	$\alpha$ CAUSE $\beta$ , where $\alpha$ , $\beta$ are logical structures of any type

However, they will still be referred to as '[active] accomplishments', since this is the standard term for them in the literature.

These decompositional representations of verbs are termed 'logical structures', and the schemas for the classes are given in Table 2.3. Following the conventions of formal semantics, constants (which are normally predicates) are presented in boldface followed by a prime, whereas variable elements are presented in normal typeface. The elements in boldface + prime are part of the vocabulary of the semantic metalanguage used in the decomposition; they are not words from any particular human language, despite their obvious resemblance to English words. Hence the same representations are used for all languages (where appropriate), e.g. the logical structure for Lakhota *t'á* and English *die* would be BECOME **dead'** (x). The variables are filled by lexical items from the language being analysed; for example, the English sentence 'the dog died' would have the logical structure BECOME **dead'** (dog), while the corresponding Lakhota

<sup>8</sup> The following table compares the verb class taxonomy presented here with that assumed in work prior to Van Valin and LaPolla (1997) (VV&LP). Semelfactive verbs were not included in the 1997 classification.

Verb class (1997)	Pre-VV&LP label
State	State
Activity	Activity
Achievement	Achievement (punctual)
Accomplishment	Achievement (durative)
Active accomplishment	Accomplishment
Causative state	—
Causative activity	—
Causative achievement	Accomplishment
Causative accomplishment	Accomplishment
Causative active accomplishment	—

sentence *šúka ki t'é* ‘the dog died’ would have the logical structure **BECOME dead’** (*šúka*). Thus, the constants should be from the semantic metalanguage, while the variable(s) should be filled by lexical items from the language in question.<sup>9</sup>

The derivational relationships illustrated in (2.11) and (2.12) can be readily accounted for in terms of this system of lexical decomposition. The state → accomplishment → causative accomplishment pattern found in Huallaga Quechua follows directly from the lexical representations, e.g. in (2.11c), *hatun-*(**big’** (x)) → *hatun-ya:-* (BECOME **big’** (x)) → *hatun-ya:-chi-* (. . . CAUSE [BECOME **big’** (x)]). The pattern in Yagua, French and Russian also indicates a systematic relationship among these classes, but the function of the morphological markers is to cancel part of the logical structure rather than to add components to it, e.g. in (2.12a), *-muta-* (. . . CAUSE [BECOME **open’** (x)]), *-muta-y-* (BECOME **open’** (x)), in which *-y-* cancels the ‘. . . CAUSE’ part of the logical structure, and *-muta-y-maa* (**open’** (x)), in which *-maa* cancels the BECOME part of the logical structure.

This system of lexical representation, while much richer than that employed by some other theories,<sup>10</sup> is nevertheless only a first approximation to the kind of compositional system which is required for deeper lexical semantic analysis. Van Valin and Wilkins (1993) explores the features of such a system, focussing on the decomposition of cognition verbs in English and Mparntwe Arrernte, and Van Valin and LaPolla (1997) explores the extended decomposition of English verbs of saying. Mairal and Faber (2002) investigates the extended decomposition of verbs of cutting in English, while González Orta (2002) examines the semantic structure of the Old English verb *secgan* ‘say’.

Examples of some English verbs with their logical structure are presented in (2.17).

- (2.17) a. STATES
- |                        |  |
|------------------------|--|
| Pat is a fool.         | <b>be’</b> (Pat, [ <b>fool’</b> ])         |
| The cup is shattered.  | <b>shattered’</b> (cup)                    |
| Kim is in the library. | <b>be-in’</b> (library, Kim) <sup>11</sup> |
| Dana saw the picture.  | <b>see’</b> (Dana, picture)                |
- b. ACTIVITIES
- |                     |  |
|---------------------|--|
| The children cried. | <b>do’</b> (children, [ <b>cry’</b> (children)]) |
| Carl ate pizza.     | <b>do’</b> (Carl, [ <b>eat’</b> (Carl, pizza)])  |

<sup>9</sup> If the constants were also to be drawn from different languages, then the logical structures would become unintelligible and difficult, if not impossible, to compare, e.g. English BECOME **dead’** (dog) vs German WERDEN **tot’** (Hund) vs Lakhota UYÁ **t’a’** (*šúka*). The point of the semantic metalanguage is to have a common representation for the meaning of verbs and other predicators across languages, in order to facilitate cross-linguistic comparison and generalization.

<sup>10</sup> The system of lexical decomposition proposed in Rappaport Hovav and Levin (1998) is quite similar to the RRG system, especially to the earlier system referred to in fn. 8, with reference to which the differences are largely notational. Their lexical templates correspond to the logical structure types in Table 2.3.

<sup>11</sup> The order of arguments in the logical structure will be discussed in section 2.4.1 below.

- c. ACHIEVEMENTS  
 The window shattered. INGR **shattered'** (window)  
 The balloon popped. INGR **popped'** (balloon)
- d. SEMELFACTIVES  
 Dana glimpsed the picture. SEML **see'** (Dana, picture)  
 Mary coughed. SEML **do'** (Mary, [**cough'** (Mary)])
- e. ACCOMPLISHMENTS  
 The snow melted. BECOME **melted'** (snow)  
 Mary learned French. BECOME **know'** (Mary, French)
- f. ACTIVE ACCOMPLISHMENTS  
 Chris ran to the park. **do'** (Chris, [**run'** (Chris)]) & INGR **be-at'** (park, Chris)  
 Carl ate the pizza. **do'** (Carl, [**eat'** (Carl, pizza)]) & INGR **consumed'** (pizza)
- g. CAUSATIVES  
 The dog scared the boy. [**do'** (dog, Ø)] CAUSE [**feel'** (boy, [**afraid'**])]   
 Max melted the ice. [**do'** (Max, Ø)] CAUSE [BECOME **melted'** (ice)]  
 The cat popped the balloon. [**do'** (cat, Ø)] CAUSE [INGR **popped'** (balloon)]  
 Sam flashed the light. [**do'** (Sam, Ø)] CAUSE [SEML **do'** (light, [**flash'** (light)])]  
 Felix bounced the ball. [**do'** (Felix, Ø)] CAUSE [**do'** (ball, [**bounce'** (ball)])]  
 Mary fed the pizza to the child. [**do'** (Mary, Ø)] CAUSE [**do'** (child, [**eat'** (child, pizza)]) & INGR **consumed'** (pizza)]

In (2.17g), '**do'** (x, Ø)' represents an unspecified activity.

A crucial point to be emphasized is that it is necessary to distinguish the basic lexical meaning of a verb, e.g. *drink* as an activity verb, from its meaning in a particular context, e.g. *drink a glass of beer* as an active accomplishment predication. The former would have '**do'** (x, [**drink'** (x, y)])' as its representation in its lexical entry in the lexicon, whereas the latter would have '**do'** (x, [**drink'** (x, y)]) & INGR **consumed'** (y)' as the semantic representation of the core of the clause in which *drink* appears. A given logical structure is intended to represent a particular meaning or interpretation of a lexical item; it is not necessarily the case that there is a single logical structure underlying all of the uses of a particular verbal lexical item. It is not necessary to list each of these verbs separately in the lexicon; rather, the activity forms would be listed and the active accomplishment use would be derived by the following lexical rules.

- (2.18) a. Motion verbs:  
**do'** (x, [**pred'** (x)]) <-> **do'** (x, [**pred'** (x)]) & INGR **be-LOC'** (y, x)
- b. Creation/consumption verbs:  
**do'** (x, [**pred<sub>1</sub>'** (x, y)]) <-> **do'** (x, [**pred<sub>1</sub>'** (x, y)]) & INGR **pred<sub>2</sub>'** (y)

Similarly, verbs which are related morphologically could also be derived by lexical rules. For example, the Huallaga Quechua accomplishment forms in the second column in (2.11) would be derived from the state forms in the first column by an inchoativization rule in the lexicon, and the causative accomplishment forms in the third column would be derived from the accomplishment forms in the second

column by a causativization rule in the lexicon.<sup>12</sup> For a polysemous verb each meaning would be associated with a different logical structure; for example, *take* in the sense of ‘obtain’ or ‘get’ would have a different logical structure from *take* in the sense of ‘carry’. Logical structures are associated fundamentally with the meanings which verbs express.

Adjectives are treated as state predicates in logical structure when they function predicatively, and following Schwartz (1993) attributive and identificational predications are given the logical structures in (2.19a’,b’). Specificational predications have the logical structure in (2.19c’), following Pavey (2004). Equational predications are represented as in (2.19d’).

- |           |   |                  |
|-----------|---|------------------|
| (2.19) a. | Pat is tall.                                  | Attributive      |
| a’.       | <b>be’</b> (Pat, [ <b>tall’</b> ])            |                  |
| b.        | Kim is a lawyer.                              | Identificational |
| b’.       | <b>be’</b> (Kim, [ <b>a lawyer’</b> ])        |                  |
| c.        | Chris is the winner.                          | Specificational  |
| c’.       | <b>be’</b> (Chris, [ <b>the winner’</b> ])    |                  |
| d.        | Kim’s sister is Sandy’s lawyer.               | Equational       |
| d’.       | <b>equate’</b> (Kim’s sister, Sandy’s lawyer) |                  |

**Be’** in these logical structures does not correspond to English *be*, which, as noted in section 1.3, is not part of the predicate in a copular construction; rather **be’** serves only to indicate attributive, identificational and specificational predications in logical structures. Result state predications do not contain it, e.g. **dead’** (dog) for *The dog is dead*. In attributive and identificational predications, the second argument position of **be’** is filled by an adjectival or nominal predicate. In a specificational predication, it is filled by a referring expression, which serves as the nucleus of the clause; in such predications, the first argument represents a variable and the second its value (DeClerck 1988). In equational predications, on the other hand, the two argument positions are both filled by referring expressions, and referential identity is asserted. The English verb *be* is the actual predicate in the nucleus only in equational predications; in the other three types it is an auxiliary verb in the nucleus but not part of the predicate, as in Figure 1.6.

English uses *be* for a wide range of stative predications, while other languages make important semantic distinctions within this range. In Tagalog, for example, inherent attributes and result states are distinguished, as illustrated in (2.20) (from Ricardo Nolasco, personal communication).

- |           |                          |
|-----------|--------------------------|
| (2.20) a. | Puti ang damit niya.     |
|           | white NOM clothes her    |
|           | ‘Her clothes are white.’ |
| b.        | Ma-puti ang damit niya.  |
|           | -white NOM clothes her   |
|           | ‘Her clothes are clean.’ |

<sup>12</sup> See Van Valin and LaPolla (1997), section 4.6, Van Valin (2004) and section 5.2 below for a discussion of lexical rules in RRG.



The logical structure for (2.20a) is **be'** (damit niya, [**white'**]), an individual-level predicate (see n. 3), while the logical structure for (b) is **white'** (damit niya), a stage-level predicate. Spanish uses four different verbs in constructions whose English equivalents all use *be*.

- |           |                               |                                       |
|-----------|-------------------------------|---------------------------------------|
| (2.21) a. | Pat is tall.                  | <b>be'</b> (Pat, [ <b>tall'</b> ])    |
| a'.       | Pat es alta.                  | Spanish: <i>ser</i> 'to be'           |
| b.        | Pat is in the library.        | <b>be-in'</b> (Pat, library)          |
| b'.       | Pat está en la biblioteca.    | Spanish: <i>estar</i> 'to be located' |
| c.        | Pat is cold (i.e. feels cold) | <b>feel'</b> (Pat, [ <b>cold'</b> ])  |
| c'.       | Pat tiene frío.               | Spanish: <i>tener</i> 'to have'       |
| d.        | The weather is cold.          | <b>cold'</b> (weather)                |
| d'.       | Hace frío.                    | Spanish: <i>hacer</i> 'to make, do'   |

Thus, simply because a number of stative predications in a language all contain the same copula, it cannot be assumed that they have the same logical structure.

Predicative prepositions are also state predicates, as exemplified in (2.17a). When predicative PPs function as adjunct modifiers, they take the logical structure of the main verb as one of their arguments. This is exemplified in (2.22).

- |           |  |
|-----------|--|
| (2.22) a. | Chris ran in the park.   |
| b.        | <b>be-in'</b> (park, [ <b>do'</b> (Chris, [ <b>run'</b> (Chris))]) |

In (2.22a), Chris' running takes place in the park, and therefore the logical structure of the predicative preposition *in* is the highest predicate in the logical structure; it takes *the park* and the logical structure for *run* as its two arguments. This contrasts with the logical structure of the active accomplishment *Chris ran to the park* in (2.17f); there the PP expresses the location of the referent of *Chris*, not the location of the event of running, and in this example *to the park* is an argument-adjunct PP.

Adverbs are represented in logical structure as one-place predicates, which modify different parts of a logical structure.<sup>13</sup> Temporal adverbs take the whole logical structure as their argument, as in (2.23).

- |           |  |
|-----------|--|
| (2.23) a. | Yesterday Chris ran to the park.   |
| b.        | <b>yesterday'</b> ( <b>do'</b> (Chris, [ <b>run'</b> (Chris)]) & INGR <b>be-at'</b> (park, Chris)) |

Manner adverbs modify activity predicates primarily, while pace adverbs can modify any kind of durational predicate; they are illustrated in (2.24a). Aspectual adverbs modify the basic state or activity predicate, as in (2.24b).

- |           |   |
|-----------|---|
| (2.24) a. | Pat elegantly closed the door slowly.   |
| a'.       | [ <b>elegant'</b> ( <b>do'</b> (x, Ø))] CAUSE [ <b>slow'</b> (BECOME <b>closed'</b> (y))] |
| b.        | The ice melted completely / The ice completely melted.                                    |
| b'.       | BECOME ( <b>complete'</b> ( <b>melted'</b> (ice)))  |

<sup>13</sup> See Van Valin and LaPolla (1997), section 4.4.1.2, for a detailed discussion of adverbs and their semantic representation.



- (2.28) Qualia Theory (Pustejovsky 1991:426–7)
- a. Constitutive Role: the relation between an object and its constituents, or proper parts
    1. Material
    2. Weight
    3. Parts and component elements
  - b. Formal Role: that which distinguishes the object within a larger domain
    1. Orientation
    2. Magnitude
    3. Shape
    4. Dimensionality
    5. Color
    6. Position
  - c. Telic Role: purpose and function of the object
    1. Purpose that an agent has in performing an act
    2. Built-in function or aim that specifies certain activities
  - d. Agentive Role: factors involved in the origin or “bringing about” of an object
    1. Creator
    2. Artifact
    3. Natural kind
    4. Causal chain

Pustejovsky gives the following representation for *novel*.<sup>14</sup>

- (2.29) **novel** (y)
- a. Const: **narrative'** (y)
  - b. Form: **book'** (y), **disk'** (y)
  - c. Telic: **do'** (x, [**read'** (x, y)])
  - d. Agentive: **artifact'** (y), **do'** (x, [**write'** (x, y)]) & INGR **exist'** (y)

The source of the two interpretations for (2.27) is now clear: one reading is based on the telic role of *novel*, while the other is derived from the agentive role. In the case of (2.27), *Dana began a new novel*, we would have the following logical structure.<sup>15</sup>

- (2.30) BECOME **do'** ([**Dana** (x), { . . . }], [**verb'** ([**Dana** (x), { . . . }], [**novel** (y), { . . . ,  $Q_T$ (**do'** (x, [**read'** (x, y)]),  $Q_A$ (**do'** (x, [**write'** (x, y)]))}]])])

*Begin* is treated semantically like a complement-taking predicate with an unspecified complement verb (the ‘**verb'**’ in the logical structure), and the semantic content of the unspecified verb is supplied by the logical structure in the telic

<sup>14</sup> The logical structure notation developed in this chapter has been used in place of the verb notation used in the original.

<sup>15</sup> ‘{ . . . }’ represents qualia which are not specified for the example. The logical structure for *begin* would be BECOME **do'** (x, y), where the logical structure of the complement verb fills the y variable slot.

role in the qualia for the ‘Dana began to read a novel’ interpretation and in the agentive role in the qualia for the ‘Dana began to write a novel’ reading. Since qualia express important semantic properties of nominals, qualia may be used to represent the selectional restrictions of verbs. That is, if a verb requires a particular type of argument, that argument position can be annotated with the appropriate qualia type, and then only NPs whose head noun has qualia compatible with it may function in the logical structure.

An integral part of an NP is the set of nominal operators, which were introduced in section 1.6. They may be given a representation in the semantic representation of the NP analogous to the representation of operators in the semantic representation of the clause. The NP operators are summarized in (2.31).

$$(2.31) \quad \langle_{\text{DEIC}} \text{PROX} \langle_{\text{DEF}} + \langle_{\text{NEG}} \emptyset \langle_{\text{QNT}} \exists \langle_{\text{NUM}} \text{SG} \langle_{\text{NASP}} \text{COUNT} \langle_{\text{N}} \rangle \rangle \rangle \rangle \rangle \rangle$$

The logical structure for *the scarf* would be as in (2.32).

$$(2.32) \quad \langle_{\text{DEF}} + \langle_{\text{NEG}} \emptyset \langle_{\text{QNT}} \exists \langle_{\text{NUM}} \text{SG} \langle_{\text{NASP}} \text{COUNT} \langle_{\text{N}} \langle_{\text{scarf}} \rangle \rangle \rangle \rangle \rangle$$

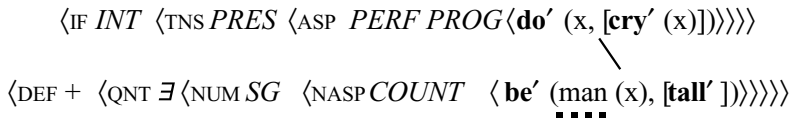
Possessive NP constructions involve a possessive predication within the NP. Possessive predications are based on **have'** (x, y), e.g. **have'** (woman, book) for *The woman has a book*, and the corresponding alienable possessive NP *the woman's book* would be represented as **have'** (woman, book), with the head underlined. In a possessive predication, the first argument of **have'** is the possessor and the second argument the possessed (see Table 2.4 below), and therefore within the NP the possessed is normally selected as the head of the NP. It is possible, however, to choose the possessor as the head, i.e. **have'** (woman, book), yielding *the woman with the book*. Certain types of NP adjuncts receive a similar representation, e.g. the NP *the table in the library* would have the representation **be-in'** (library, table). Inalienable possession is represented by **have.as.part'** (x, y), e.g. **have.as.part'** (woman, arm) for *the woman's arm* or *the arm of the woman*. Kin possession is expressed by **have.as.kin'** (x, y), as in **have.as.kin'** (woman, sister) for *the woman's sister* or *the sister of the woman*.

Pronouns and reflexive pronouns are represented directly in the logical structure in which they occur, as illustrated in (2.33).

- (2.33) a. He saw Pat.  
       a'. **see'** (3sgM, Pat)  
       b. Mary saw herself.  
       b'. **see'** (Mary, herself)

The conditions on possible intrasentential coreference involving pronouns are related to information structure; see Van Valin and LaPolla (1997), section 5.6. The conditions on the binding of reflexive pronouns like *herself* will be discussed in sections 5.3 and 7.5 below.

Since every argument in a logical structure would receive a representation like the one in (2.32) in a full semantic representation, such representations



would be extremely complex and cumbersome. An example of the representation of a simple intransitive clause, *Has the tall man been crying?*, is given in Figure 2.1.

## 2.4 Semantic roles

The next step in the development of the semantic representation is the specification of the semantic relations that obtain between a verb or other predicator and its arguments. Semantic roles have been discussed at three distinct levels of generality. The first are what may be called ‘verb-specific’ semantic roles, e.g. runner, killer, hearer, broken, etc. The second are thematic relations, which are generalizations across the verb-specific roles, e.g. agent, instrument, experiencer, theme, patient. The third are generalized semantic roles, the semantic macro-roles, actor and undergoer, which are generalizations across thematic relations. Actor is a generalization across agent, experiencer, instrument and other roles, while undergoer is a generalization subsuming patient, theme, recipient and other roles. Agent is the prototype for actor, and patient is the prototype for undergoer. The relationships among the three types of semantic roles are summarized in Figure 2.2 on p. 54.

RRG posits two types of semantic roles: thematic relations and semantic macro-roles, which play a crucial role in the linking system.

### 2.4.1 Thematic relations

The logical structures introduced in section 2.1 form the heart of the lexical entry for a verb, and they correspond to the thematic relations /  $\theta$ -role lists that other theories associate with a verb in its lexical entry. There is, however, no listing of thematic relations in a verb's lexical entry in RRG; rather, thematic relations are defined in terms of the argument positions in the decomposed logical structure representations, following Jackendoff (1976). The definitions are given in Table 2.4 on p. 55. (Verbs of directed perception are *listen to*, whose logical structure is given in Table 2.4, *look at* or *watch*, *feel*, *taste* and *smell*, the last three having the same form as the corresponding stative perception verbs.) In terms of these definitions, in (2.17a) *Pat* is an identified, the first argument of an identificational predication, while *the cup* is a patient, the single argument of a one-place stative predicate of state or condition. In the locational example, *the*

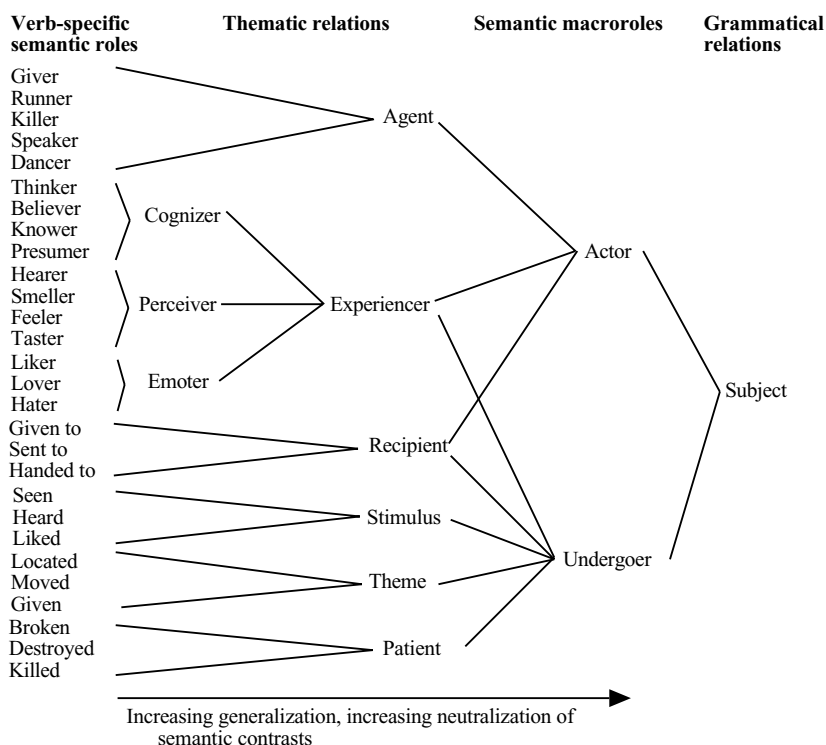


Figure 2.2 *Continuum from verb-specific semantic roles to grammatical relations*

*library* is a location and *Kim* is a theme.<sup>16</sup> In the last example with *see*, a two-place stative perception verb, *Dana* is the first argument and therefore a perceiver, while *the picture* is the second argument and a stimulus. The thematic relations assignments of achievement, accomplishment and semelfactive verbs are the same as the corresponding state or activity, as the addition of the operator BECOME, SEML or INGR does not affect the argument structure of the logical structure.

Equational predicates are unique in that their two argument positions define the same semantic role. These predications involve only referential identity, not semantic roles in the usual sense. There is no semantic contrast between (2.34a) and (2.34b).

- (2.34) a. Kim's sister is Sandy's lawyer.  
 b. Sandy's lawyer is Kim's sister.

<sup>16</sup> The order of arguments in the semantics reflects their thematic relation and is not correlated with the word order of English or any other language. All locational predicates in every language have this logical structure, with the first argument a location and the second one a theme, and this is true regardless of the word order of the language. The relationship between the order of arguments in logical structures and the overt order of NPs and PPs in a sentence is mediated by the linking algorithm to be introduced in chapter 5.

Table 2.4 *Definitions of thematic relations in terms of logical structure argument positions*

## I. STATE VERBS

### A. Single argument

1. State or condition      **broken'** (x)      x = PATIENT

2. Existence      **exist'** (x)      x = ENTITY

### B. Two arguments

1. Pure location      **be-LOC'** (x, y)      x = LOCATION,  
y = THEME

2. Perception      **hear'** (x, y)      x = PERCEIVER,  
y = STIMULUS

3. Cognition      **know'** (x, y)      x = COGNIZER,  
y = CONTENT

4. Desire      **want'** (x, y)      x = WANTER,  
y = DESIRE

5. Propositional Attitude      **consider'** (x, y)      x = JUDGER,  
y = JUDGMENT

6. Possession      **have'** (x, y)      x = POSSESSOR,  
y = POSSESSED

7. Internal Experience      **feel'** (x, y)      x = EXPERIENCER,  
y = SENSATION

8. Emotion      **love'** (x, y)      x = EMOTER,  
y = TARGET

9. Attributive      **be'** (x, [pred'])      x = ATTRIBUTANT,  
y = ATTRIBUTE

10. Identificational      **be'** (x, [pred'])      x = IDENTIFIED,  
y = IDENTITY

11. Specificational      **be'** (x, y)      x = VARIABLE,  
y = VALUE

12. Equational      **equate'** (x, y)      x, y = REFERENT

## II. ACTIVITY VERBS

### A. Single argument

1. Unspecified action      **do'** (x, Ø)      x = EFFECTOR

2. Motion      **do'** (x, [walk' (x)])      x = MOVER

3. Static motion      **do'** (x, [spin' (x)])      x = ST-MOVER

4. Light emission      **do'** (x, [shine' (x)])      x = L-EMITTER

5. Sound emission      **do'** (x, [gurgle' (x)])      x = S-EMITTER

### B. One or two arguments

1. Performance      **do'** (x, [sing' (x, (y))])      x = PERFORMER,  
y = PERFORMANCE

2. Consumption      **do'** (x, [eat' (x, (y))])      x = CONSUMER,  
y = CONSUMED

3. Creation      **do'** (x, [write' (x, (y))])      x = CREATOR,  
y = CREATION

4. Directed perception      **do'** (x, [hear' (x, (y))])      x = OBSERVER,  
y = STIMULUS

5. Use      **do'** (x, [use' (x, y)])      x = USER,  
y = IMPLEMENT

The difference between these two is pragmatic, not semantic. Hence there is no semantic role distinction between the two arguments, and the choice of one or the other as subject appears to be driven by information structure contrasts, which will be discussed in the next chapter.

Activity verbs are the other class of primitive predicates, and there are at least ten subclasses. The first argument of a non-motion activity verb is an effector, the participant which does some action and which is unmarked for volition and control. The other thematic relations associated with the first argument of activity verbs are really subtypes of effector. Activity verbs tend strongly to be single-argument, but there are some which may have two arguments, e.g. *eat*, *drink*, *play*.

A prominent thematic relation that is missing from Table 2.4 is that of agent. While many approaches take agent to be one of the basic thematic relations, in RRG it is analysed very differently. To begin with, if agent is taken to be the intentional, volitional and controlling participant in an event, then there are many verbs which appear to take agents in some sentences but not others.

- (2.35) a. The man killed his neighbour.
- b. The man intentionally killed his neighbour.
- c. The man accidentally killed his neighbour.
- (2.36) a. The man murdered his neighbour.
- b. ?The man intentionally murdered his neighbour.
- c. \*The man accidentally murdered his neighbour.
- (2.37) a. A branch falling from Pat's tree killed his neighbour.
- b. \*A branch falling from Pat's tree murdered his neighbour.

*Murder*, unlike *kill*, requires a perpetrator which is acting intentionally and volitionally and is in control of his or her actions. This precludes sentences like (2.36c), in which there is no intention on the part of the perpetrator to carry out the action, and like (2.37b) in which the perpetrator is an inanimate entity incapable of volition, intention and control by definition. Thus, *murder* requires an agent argument. *Kill*, on the other hand, is quite compatible with a non-intentional perpetrator, as (2.35c) shows, or with an inanimate perpetrator, as (2.37a) shows. Facts like these led Holisky (1987) and Van Valin and Wilkins (1996) to argue that the basic notion that applies to both of these verbs is effector, and agents are a special type of effector. With verbs like *murder*, the agency is lexicalized in the meaning of the verb and therefore would have to be represented in its logical structure. Following Ross (1972), DO signals agency in logical structures, e.g. DO (x, [**do'** (x, Ø)] CAUSE [BECOME **dead'** (y)]) for the logical structure for *murder*. With verbs like *kill*, on the other hand, the effector argument is interpreted as an agent if its referent is human (or sentient) and if there is no information in the clause to the contrary, e.g. an adverb like *accidentally*. Hence the logical structure for *kill* would be [**do'** (x, Ø)] CAUSE [BECOME **dead'** (y)]. Languages differ with respect to the extent to which agency is lexicalized in verbs: English



appears to have only relatively few verbs which absolutely require an agentive interpretation of their effector, whereas Japanese seems to lexicalize agency with many more verbs than English (Hasegawa 1996).

Causative verbs have a logical structure composed of (typically) an activity logical structure plus a second logical structure of any of the six *Aktionsart* types linked by the connective CAUSE. Accordingly, the role assignments of the causative logical structure are those of the constituent activity and other logical structures; no new roles are added. Hence in (2.17g) the thematic relations of the arguments are a function of the assignments in (2.17a)–(2.17f).

The representation of arguments in the logical structure of a verb or predicator provides a strict definition of ‘core argument’. In section 1.1 it was stated simply that the core contains the arguments of the predicate in the nucleus, and it is now possible to state this more precisely. All arguments which appear in the core of a simple clause must be linked to argument positions in the logical structure of the predicate in the nucleus, and, in the default situation, all arguments in the logical structure of the predicate must appear in the core of the clause. However, it is not always the case that an argument in the logical structure occurs in the core; in a passive construction, for example, the effector, if overt, will be realized as an oblique constituent in the periphery. Among core arguments a further distinction is made between direct and oblique core arguments, as noted in section 1.1. This contrast is based on the morphological coding of the arguments: direct core arguments are those that are morphologically unmarked or coded with a direct case, as in dependent-marking languages like English and German, or are cross-referenced on the verb, as in head-marking languages like Lakhota and Tzotzil. Oblique core arguments are those marked by an adposition or by an oblique case. Thus English *give* has three core arguments; in *Dana gave Pat the key* there are three direct core arguments, while in *Dana gave the key to Pat* there are two direct core arguments and one oblique core argument. This will be discussed in more detail in sections 4.4–4.5.

It might appear from Table 2.4 that RRG posits a great many thematic relations, but in fact there are only five relevant distinctions. The five distinctions correspond to the five possible argument positions in logical structures. This may be represented as in Figure 2.3 on p. 58. Agents are wilful, controlling, instigating participants in states of affairs, while patients are strongly affected participants. Taking these as endpoints on the continuum makes it possible to place the other role-types with respect to them. The DO of lexicalized agency always co-occurs with the **do'** (x, . . . which defines effector and its subtypes, and accordingly the first two columns are closely related to each other; all of them express participants which do something. At the other end of the continuum fall patient and theme, etc. The single argument of state **predicate'** (x) includes those participants which are crushed, killed, smashed, shattered, broken, destroyed, etc., while the second argument of **predicate'** (x, y) includes those participants which are placed, moved, thrown, given, possessed, transferred, seen, heard, loved, etc. In terms of affectedness, the former type of participant is much more affected than the latter,

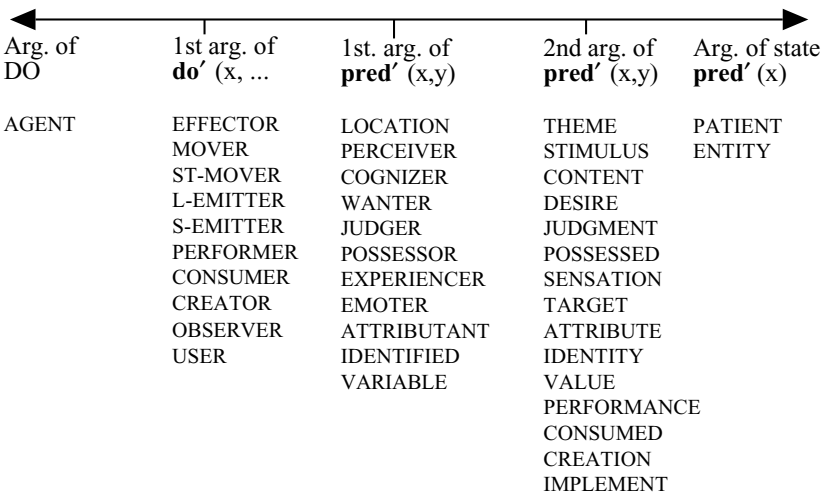


Figure 2.3 *Thematic relations continuum in terms of logical structure argument positions*

hence the placement of the single argument of state **predicate'** (x) at the end of the hierarchy. Into the middle of the continuum falls the first argument of **predicate'** (x, y). If it is contrasted with the first argument of **do'**, it is clear that seeing, thinking, believing, possessing, etc., are less agent-like than are speaking, doing, moving, performing, consuming, hence their placement to the right of effector, etc. If, on the other hand, the contrast is with the second argument of **predicate'** (x, y), then the reverse conclusion follows. Seeing, thinking, liking, believing, etc., involve some kind of internal activity (mental, emotional or perceptual) on the part of the participant, whereas being seen, being thought about, being liked or being believed does not require any action or effort of any kind on the part of the participant. Hence the participant denoted by the first argument is more active and hence more agent-like than the participant referred to by the second argument, and, accordingly, the first argument is closer to the agent end of the hierarchy than the second argument. Thus, the positioning of the different argument positions in the continuum in Figure 2.3 reflects the semantic contrasts among them.

In addition to static locations, e.g. **be-at'** (x, y) and possession, e.g. **have'** (x, y), there are also change of location and possession arguments. 'Goal' may be defined as the location argument in the following logical structure configuration: . . . INGR/BECOME **be-at/in/on'** (x, y). 'Recipient' may be defined as the possessor argument in the following configuration: . . . INGR/BECOME **have'** (x, y). 'Source' may be defined as the location or possessor argument in either of the configurations: . . . INGR/BECOME NOT **be-at'** (x, y) or . . . INGR/BECOME NOT **have'** (x, y).

The thematic relation of instrument is also missing from Table 2.4, because there are actually two distinct roles that it subsumes. The first is analysed as a

type of effector, specifically as a manipulated inanimate effector in a causal chain. This is illustrated in (2.38).

- (2.38) a. Leslie shattered the window with a rock.  
 b. [**do'** (Leslie, Ø)] CAUSE [[**do'** (rock, Ø)] CAUSE [INGR **shattered'** (window)]]

Note that the second part of the logical structure can be a complete clause, *The rock shattered the window*.<sup>17</sup> It is of course also possible to leave out the intermediate effector, yielding *Leslie shattered the window*. The term 'instrument' will be used to refer to intermediate inanimate effectors in a causal chain. The second type is not part of a causal chain; it will be referred to as an 'implement'. ('^' is a connective meaning 'and simultaneously'.)

- (2.39) a. Chris ate the soup with a spoon.  
 b. **do'** (Chris, [**eat'** (Chris, soup) ^ **use'** (Chris, spoon)])

Unlike in (2.38), the implement cannot function as the subject if the effector is omitted, i.e. *\*The spoon ate the soup*. Implements can only be added to an activity logical structure. Logical structures may be expanded primarily in three ways: (1) to specify a full causal chain, as in (2.38), (2) to add an implement as in (2.39), and (3) to specify the source, path (or means) and goal (or recipient) with motion active accomplishment predications and transfer predications.

The theoretical implications of this system for deriving thematic relations from logical structures are very important. If it is the case that the thematic relations which a verb takes are a function of the argument positions in its logical structure, and there is a system of lexical representation in which there are independent criteria for assigning logical structures to verbs, then there are independent criteria for assigning thematic relations to verbs. This is the case because the thematic relations are a function of the logical structure of a verb, and there are independent criteria for attributing a logical structure to a verb. Thematic relations cannot be assigned on an arbitrary basis, because logical structures cannot be assigned arbitrarily; rather, logical structures are determined on the basis of the tests in Table 2.2. Thus the great advantage to this system of lexical representation is that there are tests which provide independent criteria for assigning a particular logical structure and hence a particular argument structure to a given verb.

This system also has important implications for how one actually goes about analysing a language. In order to determine the argument structure of a verb, it is first necessary to ascertain its *Aktionsart* in the construction in which it occurs, using the tests in Table 2.2. Having established that, its logical structure can be created, following Table 2.3, and its argument structure follows from Table 2.4. Thus, it is necessary to ascertain the *Aktionsart* of the verb in the sentence, and from this its argument structure follows. What is *not* appropriate

<sup>17</sup> For detailed discussion of effectors and instruments, see Van Valin and Wilkins (1996) and Van Valin and LaPolla (1997), section 3.2.3.2.

in this system is to decide arbitrarily what thematic relations a verb should have and then to construct a logical structure which would yield those roles, or to start from a semantic paraphrase and then construct a logical structure to express that paraphrase. The logical structures are determined by the tests in Table 2.2.

It is important to emphasize that in the system presented here, thematic relations play no direct role in lexical representation; the relevant semantic properties of the verbs are expressed by the decompositional logical structure representations, not by thematic relations. Thus even though a large number of role labels like agent, cognizer, theme and patient have been used in this discussion, they are merely mnemonics for argument positions in logical structure. They have no independent status. Since there is as yet no adequate decompositional representation for the primitive state and activity predicates which are the argument-bearing components of the system and which carry the substantive semantic load, these labels are useful in that they indicate the subclass of the predicate; hence cognizer means 'first argument of a two-place state predicate of cognition', judgment means 'second argument of a two-place state predicate of propositional attitude', and theme means 'second argument of a two-place state predicate of location', for example. These labels will be used in this way, and it must be kept clearly in mind that these labels do not refer to independently meaningful relations but rather to argument positions in the logical structure of predicates of a certain type.

#### 2.4.2 Macroroles

The second type of semantic roles is generalized semantic roles, the two macroroles 'actor' and 'undergoer'.<sup>18</sup> These are the two primary arguments of a transitive predication, either one of which may be the single argument of an intransitive verb. They correspond to what is pretheoretically commonly called 'logical subject' and 'logical object', but these labels are not utilized in RRG because 'subject' and 'object' are normally used to refer to syntactic, not semantic relations. Generally speaking, the actor is the most agent-like argument, while the undergoer is the most patient-like. They are called 'macroroles' because each subsumes a number of specific thematic relations. Macroroles are motivated by the fact that in grammatical constructions groups of thematic relations are treated alike. For example, themes and patients function alike for certain purposes in the grammar. It is necessary to distinguish them on semantic and other grounds. But nevertheless, the grammar, for certain purposes, treats these roles as essentially the same, e.g. they can be both the direct object in an active and the subject in a passive. In fact, active and passive in English can be described in terms of lists of thematic relations. Agent, effector, experiencer, perceiver, possessor, judge, etc., can be the subject of an active verb, while patient, theme, stimulus, possessed, location, etc., can be direct object. In the English passive, patient, theme, stimulus, possessed, location, etc., can be subject, while agent,

<sup>18</sup> See Van Valin (1999a) for a comparison of different theories of generalized semantic roles.

effector, experiencer, perceiver, possessor, judge, etc., can be the object of the preposition *by*. It appears that a significant generalization is being missed here, since there are long disjunctive lists of roles in these statements. But in fact, it is not an accident that they seem to group together the way they do, and the obvious generalization can be captured in terms of semantic macroroles: in an active clause, the actor is subject and the undergoer direct object, while in a passive the undergoer is subject and the actor is in a peripheral PP.

The relation between macroroles and logical structure argument positions is captured in the actor-undergoer hierarchy in Figure 2.4. This double hierarchy

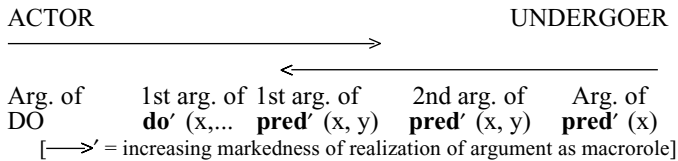


Figure 2.4 Actor-undergoer hierarchy (preliminary)

says simply that given the logical structure of a transitive verb, the leftmost argument will be the actor and that the rightmost argument will be the undergoer. This is the default situation. Marked assignments to undergoer are possible, as in the 'dative shift' alternation in which the first argument of the two-place state predicate, not the second, is undergoer, as in (2.40c).

- (2.40) a. [**do'** (Pat, Ø)] CAUSE [BECOME **have'** (Chris, book)]  
 b. Pat [actor] gave the book [undergoer] to Chris.  
 c. Pat [actor] gave Chris [undergoer] the book.

There are languages which have only the first possibility, some which have only the second, and some which have both. The issues raised by three-place predicates and their implications for the hierarchy will be discussed further in section 4.4.

The hierarchy in Figure 2.4 represents thematic relations along the continuum presented in Figure 2.3. The prototypical actor is an agent, the prototypical undergoer a patient, but effectors and arguments bearing other thematic relations can also function as actor, and arguments bearing thematic relations other than patient can also serve as undergoer; this depends on the logical structure of the particular verb, as shown in Table 2.4. It must be emphasized that the label 'undergoer' should not be taken literally, just as 'actor' should not. The actor of *see* does not do anything but is nevertheless an actor in the sense intended here, i.e. the logical subject; one could say that the actor is the participant which is responsible for the state of affairs, in the sense that it is impossible to have an action without an entity doing the action, a perceptual situation without a perceiving entity, or a cognitive or emotional situation without a participant experiencing the cognitive or emotional state. Similarly, the undergoer of *see* does not undergo anything, unlike the undergoer of e.g. *kill*, but it is still the undergoer of the verb, i.e. the logical object. In general, the undergoer represents the non-instigating, affected

participant in a state of affairs. The specific semantic content of the macrorole with a particular verb is supplied by the position of the argument in the logical structure, not by its macrorole status, although the two are clearly related.

The ranking of argument positions (thematic relations) in Figure 2.4 with respect to actor and undergoer selection is supported by considerable cross-linguistic evidence. The maximal unmarkedness of agent as actor and patient as undergoer follows from the fact that if a verb has an agent argument, it will always be actor, and likewise if one has a patient argument, it will always be undergoer. With respect to the actor end of the hierarchy, if a verb has both a potential agent and an inanimate effector (i.e. instrument), as in (2.38), the potential agent must be the actor, never the effector, an observation that goes back at least to Fillmore's (1968) original work on case grammar. Transitive verbs which take perceiver and stimulus arguments, e.g. *see* (**see'** (x, y)), or possessor and possessed arguments, e.g. *have* (**have'** (x, y)), always have the perceiver- or possessor-type as actor, never the stimulus- or possessed-type argument. With regard to the undergoer end of the hierarchy, the markedness relations are reversed from the actor end. If a verb takes perceiver- or possessor-type arguments and stimulus- or possessed-type arguments, e.g. y and z with *show* ([**do'** (x, Ø)] CAUSE [BECOME **see'** (y, z)]) and *give* ([**do'** (x, Ø)] CAUSE [BECOME **have'** (y, z)]), the z argument is the unmarked choice for undergoer, even though these verbs allow both possibilities in English. Evidence for this comes from a variety of sources. First, there are well-known arguments for the markedness of the y-argument-as-undergoer form of the dative-shift construction in English, e.g. the restrictions on pronominal arguments in this form. Second, nominalizations provide evidence for the priority of the z argument over y: a *bookshower* would have to be someone who shows books to people and a *studentshower* could not be someone who shows things to students but rather who shows students to people; the same interpretations are found with *flowergiver* and *girlgiver*, which cannot mean someone who habitually gives things to girls. Third, in the survey of dative-shift constructions in a wide range of languages presented in Foley and Van Valin (1985), the z-as-undergoer form is clearly the unmarked form in virtually all of the languages; in most languages other than English, the base form of a verb of the appropriate class can take only the z argument as undergoer, and a derivational morpheme of some kind must be added in those languages which allow the y argument as undergoer. It is very significant that most languages do not have dative-shift constructions at all; in them, the choice of undergoer is lexically governed, and the vast majority of the relevant verbs in these languages are like English *put* and *donate* in having z not y as undergoer. Thus with respect to the undergoer end of the hierarchy, the second argument of a two-place predicate outranks the first argument of a two-place predicate for undergoer in languages like English, Russian, Dyirbal and many others. It will be shown in section 4.4, however, that there are languages which exhibit a different pattern with three-argument verbs.

The number of macroroles that a verb takes is generally predictable from its logical structure; there are only three possibilities: 0, 1, 2. If a verb has two or

more arguments in its logical structure, e.g. [**do'** (x, Ø)] CAUSE [BECOME **be-at'** (y, z)] or **hear'** (x, y), then the unmarked situation is for it to take two macroroles. If a verb has only a single argument in its logical structure, e.g. **do'** (x, [**walk'** (x)]) or BECOME **open'** (y), then the unmarked situation is for it to have only one macrorole. Verbs with no arguments, e.g. **do'** ([**snow'**]), have no macroroles. The nature of the macroroles is also a function of the verb's logical structure. If a verb takes two, then they must be actor and undergoer. For verbs which have a single macrorole, the default choice follows directly from the logical structure of the verb: if the verb has an activity predicate in its logical structure, the macrorole will be actor; otherwise, it will be undergoer. The default macrorole assignment principles are summarized in (2.41).

- (2.41) Default Macrorole Assignment Principles
- a. Number: the number of macroroles a verb takes is less than or equal to the number of arguments in its logical structure.
    1. If a verb has two or more arguments in its logical structure, it will take two macroroles;
    2. If a verb has one argument in its logical structure, it will take one macrorole.
  - b. Nature: for verbs which take one macrorole,
    1. If the verb has an activity predicate in its logical structure, the macrorole is actor.
    2. If the verb has no activity predicate in its logical structure, the macrorole is undergoer.

In English, most verbs follow these defaults; the exceptions are intransitive location verbs with two arguments, e.g. *lie* as in *The book is lying on the table*, or motion active accomplishment verbs such as *run* in *Dana ran to the house*, which have only a single macrorole, an undergoer with *lie* and an actor with *run*. This is a systematic exception, and therefore it could be handled by a general principle governing the macrorole number of locative verbs. There are also verbs like *seem* which have a propositional argument and an experiencer in their logical structure but which do not contribute the subject or object to the clause. Since the number of macroroles is not predictable from the number of logical structure arguments with these verbs, it would have to be specified in the lexical entry of the verb, e.g. 0 for *seem*. This could be formalized in terms of a simple feature such as [MR  $\alpha$ ], with values [MR 0], [MR 1] and [MR 2]. The appearance of this feature in the lexical entry of a verb signals that the default principles are overridden. The identity of the macrorole would not need to be stipulated, however, since it follows from the general principle in (2.41b). One class of verbs appears to be a universal exception to the default generalization regarding macrorole number: activity verbs. Multiple-argument activity verbs with a non-referential second argument, e.g. *beer* in *Kim drank beer*, never have an undergoer macrorole. As noted above, the undergoer NP refers to the non-instigating, affected participant in the state of affairs denoted by the clause, and because *beer* in this example is

non-referential, it cannot refer to a specific affected entity; hence it cannot be an undergoer. In many languages this argument appears incorporated into the verb and not as an independent NP. Consequently, two-argument activity verbs with a non-referential second argument take only an actor macrorole. Those with a referential second argument, e.g. verbs of directed perception and use, do take two macroroles. Because this is a general principle of the theory, it is not necessary to put '[MR 1]' in the lexical entry of verbs like *eat*, *drink*, *read*, etc. The active accomplishment uses of these verbs are fully transitive and take two macroroles.

The macrorole number of a verb 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 the number of direct NPs that appear in the syntax, and this corresponds to the number of direct core arguments, in RRG terms. It is necessary, then, to distinguish between what Narasimhan (1998) calls 'macrorole transitivity' (M-transitivity), which refers to macrorole number, and syntactic transitivity (S-transitivity), which refers to number of direct core arguments. The number of direct core arguments need not be the same as that of macroroles; there are never more than two macroroles, but in a sentence like *Leslie sent Pat a card* there are three direct core arguments. Also, in *Pat drank beer* there are two direct core arguments but only one macrorole. From an RRG perspective, the S-transitivity a verb takes is less indicative of its syntactic behavior in simple sentences than its M-transitivity, and consequently 'transitivity' is understood in RRG as M-transitivity and is defined in terms of the number of macroroles a verb takes: 2 = transitive, 1 = intransitive, and 0 = atransitive. This is summarized in Table 2.5.

Table 2.5 *Macrorole number and transitivity*

	Semantic valence	Macrorole number	M-transitivity
<i>snow</i>	0	0	Atransitive
<i>die</i>	1	1	Intransitive
<i>drink</i> [ACTIVITY]	1 or 2	1	Intransitive
<i>drink</i> [ACT ACCOMPL]	2	2	Transitive
<i>kill</i>	2	2	Transitive
<i>set</i>	3	2	Transitive
<i>send</i>	3	2	Transitive

There are many three-argument verbs but only two macroroles; why is there no third macrorole? Two possible justifications for a third macrorole are (1) labelling the third argument of a ditransitive verb, and (2) accounting for dative case assignment. These have no force in RRG. The third argument of a ditransitive verb is a non-macrorole core argument; in German, for example, it would be a non-macrorole direct core argument, since it is not adpositionally marked, while



in English it would be a non-macrorole oblique core argument in (2.40b), since it is adpositionally marked, but a non-macrorole direct core argument in (2.40c), since it is not. Dative case assignment does not require the postulation of a third macrorole, as will be shown in section 4.4.<sup>19</sup>

There are strong empirical and theoretical reasons for rejecting the postulation of a third macrorole. First and foremost, it is highly likely that it would not be universal like actor and undergoer. While all languages have cores with two core arguments, some languages strongly disprefer and perhaps even do not permit three core arguments in a single core. Some serializing languages, e.g. Yoruba, Yatye (Stahlke 1970), fall into this category. In such languages, clauses with more than two arguments require complex expressions in which the additional argument is a core argument of a second nucleus in a second core. So, for example, in expressing a transfer a verb meaning ‘give’ would be serialized with the transfer verb in order to express the recipient, or with a verb like ‘break’ or ‘kill’ a verb meaning ‘take’ or ‘use’ would be serialized in order to express the instrument.

Second, across languages which permit three core arguments, there is no consistent morphosyntactic treatment of the third argument. Actor and undergoer, on the other hand, do have certain consistent coding properties across languages: in active voice clauses they are always direct arguments of the verb, never oblique. What ‘direct’ means morphosyntactically varies from language to language: in English it means not being marked by a preposition; in German and Russian it means being case marked in a direct case and not marked by a preposition; in head-marking languages like Lakhota (Siouan) and Tzotzil (Mayan), it means being coded on the verb. In case-marking languages, actor and undergoer are either nominative and accusative or ergative and absolutive. By contrast, there is no consistent treatment of the third core argument (Faltz 1978): it may be a direct argument in the dative case, e.g. German, Russian, Dyirbal, or an oblique argument marked by an adposition, e.g. English, Jakaltek. Actor and undergoer are never oblique arguments within the core.

This raises a further issue: what exactly would count as a third macrorole? In a language like German or Russian, for example, it could be restricted to the third direct core argument of ditransitive verbs. But in a language like English, this would imply that only the *to*-PP with certain verbs would count as being the third macrorole. Why should this particular argument be so analysed and not other oblique core arguments? In particular, if *to Chris* is the third macrorole argument in (2.40b), then why shouldn’t *on the truck* be given the same analysis in a sentence like *Dana loaded the hay on the truck*? Both PPs are omissible, and both can occur as ‘direct object’ in an alternative clause pattern, e.g. (2.40c) and *Dana loaded the truck with the hay*. Furthermore, if *on the truck* has this status in the first sentence, then shouldn’t *with the hay* also be analysed the same way in the second? In short, it is difficult to justify why some oblique core arguments should

<sup>19</sup> When the full range of the use of the dative case is examined, especially its uses in complex sentences, explaining it in terms of a third macrorole would be quite impossible; see Van Valin and LaPolla (1997), section 9.2.2.

be analysed as instantiating a third macrorole but not others, but if all oblique core arguments are so analysed, then whatever function and semantic content it would have would be very different from that of the hypothesized third macrorole in German and Russian.

Third, a third macrorole would be markedly less important for the syntax than actor and undergoer and hence is difficult to justify on syntactic grounds. It would play little or no role in subject selection with intransitive verbs. The single argument of an intransitive verb is either an actor or an undergoer in the vast majority of cases, and in those cases where the single argument is a non-actor or non-undergoer it does not correspond semantically to the third argument of three-argument verbs. It also plays no role in the major typology of syntactic systems: ergative vs accusative vs split-intransitive (e.g. Acehnese) (see chapter 4). These differences revolve around the treatment of actor and undergoer; the third argument of ditransitive verbs is not a factor.

Thus, a third macrorole would be a qualitatively different concept from the two semantic macroroles posited in RRG. It would not be universal, it would not receive consistent morphosyntactic treatment, and it would be relatively unimportant for the syntax. There is, then, no justification for positing a third macrorole and good reasons not to postulate one.

Examples of partial lexical entries for some English verbs are given in (2.42).

- (2.42) a. *smash* [do' (x, Ø)] CAUSE [BECOME **smashed'** (y)]  
 b. *receive* BECOME **have'** (x, y)  
 c. *own* **have'** (x, y)  
 d. *belong (to)* **have'** (x, y) [MR1]  
 e. *arrive* BECOME **be-at'** (x, y)  
 f. *go* **do'** (x, [move.away.from.ref.point' (x)]) & INGR **be-at'** (y, x)  
 g. *appear* **appear'** (x, y) [MR0]  
 h. *see* **see'** (x, y)  
 i. *watch* **do'** (x, [see' (x, y)])  
 j. *show* [do' (w, Ø)] CAUSE [BECOME **see'** (x, y)]  
 k. *run* **do'** (x, [run' (x)])  
 l. *eat* **do'** (x, [eat' (x, y)])  
 m. *devour* **do'** (x, [eat' (x, y)]) & INGR **consumed'** (y)  
 n. *freeze* BECOME **frozen'** (x)  
 o. *be afraid* **feel'** (x, [afraid' (y)])

No list or other explicit statement of the thematic relations associated with a verb has to be specified, since they are derived from the logical structure, and because of the principles in (2.41), nothing more is needed for indicating transitivity and macrorole choice. Only with exceptional verbs like *appear* and *belong to* must the feature [MR  $\alpha$ ], be listed. There is no need for any syntactic subcategorization information in the lexical entries of verbs in RRG. Lexical idiosyncrasies are specified in the lexical entry. For example, *show* in (2.42j) allows either its second or third argument to be undergoer (the well-known 'dative alternation'; see section 4.4), whereas *donate* does not; hence it is necessary to specify that the

third argument is the only possible choice for undergoer with *donate*, i.e. [**do'** (x, Ø)] CAUSE [BECOME **have'** (y, z)],  $U = z$ . It should be noted that the prepositions which mark the oblique core arguments of verbs like *show* are not stated in the lexical entries, as they are in all other theories; this is because they can be predicted by a general rule and therefore need not be listed (Foley and Van Valin 1984; Jolly 1991, 1993); see section 4.4.

The macroroles of actor and undergoer function as the interface between thematic and grammatical relations. Just as actor is not equivalent to agent, it is likewise not equivalent to syntactic subject; nor is undergoer equivalent to syntactic direct object. This can be seen clearly in (2.43).

- (2.43) a. Chris [SUBJ, ACTOR] drank the beer [DOBJ, UNDERGOER].  
 b. The beer [SUBJ, UNDERGOER] was drunk by Chris [ACTOR].  
 c. Chris [SUBJ, ACTOR] drank beer [DOBJ].  
 d. The fireman [SUBJ, ACTOR] ran into the burning building.  
 e. The lawyer [SUBJ, UNDERGOER] became upset over the decision.

In (2.43a) the actor is subject and the undergoer direct object, while in the passive in (2.43b) the undergoer is subject and the actor is a peripheral oblique. In (2.43c) *beer* is not undergoer because it is non-referential, *drink* being an activity verb in this sentence. The subject in (2.43d) is an actor, while the subject in (2.43e) is an undergoer. The status of grammatical relations in RRG and their interaction with semantic roles is the topic of chapter 4.

## 3 Information structure

### 3.0 General considerations

The final step in this preliminary phase of the exploration of the syntax, semantics and pragmatics interface is the characterization of the information (focus) structure of sentences. The issue of the distribution of information in clauses and sentences is one of the most important questions for linguists studying the interaction of form and function in language, and it has ramifications for all aspects of grammar. Research on this topic goes back at least to the work of Prague School linguists such as Mathesius in the 1920s.<sup>1</sup>

### 3.1 Topic and focus

The approach taken here builds upon Lambrecht's (1986, 1987, 1994, 2000) theory of information structure. In his theory, Lambrecht identifies TOPIC and FOCUS as the two primary information statuses that referring expressions may have in an utterance. These terms will be used as labels for discourse-pragmatic functions only and not for the structural positions in which they may be manifested. He adopts the definitions for topic and comment proposed in Gundel (1988).

An entity, E, is the topic of a sentence, S, iff in using S the speaker intends to increase the addressee's knowledge about, request information about, or otherwise get the addressee to act with respect to E. A predication, P, is the comment of a sentence S, iff in using S the speaker intends P to be assessed relative to the topic of S. (Gundel 1988:210)

The notion of 'comment' is related to that of focus, as will be seen below.

Two very important points are, first, not every utterance has a topic, and second, the topic element need not be the first element in a sentence. There is a direct and fundamental relationship between the element functioning as topic and the

<sup>1</sup> Mathesius (1928, 1929); more recent work in this area has included Halliday (1967, 1994), Jackendoff (1972), Kuno (1972a,b, 1975), Prince (1981a,b), Sgall, Hajičová and Panevová (1986), Gundel (1988), Vallduví (1992), Dryer (1996), Erteschik-Shir (1997), among others.

pragmatic presupposition associated with a sentence. Lambrecht characterizes it as follows:

What must be presupposed in the case of a topic is not the topic itself, nor its referent, but the status of the topic referent as a possible center of interest or matter of concern in the conversation . . . [T]he topic referent is *active* or *accessible* in the discourse . . . [T]he topic is contained in the pragmatic presupposition or is an element of the pragmatic presupposition. (1986:102)

Lambrecht (1994) gives the following definitions of pragmatic presupposition and assertion:

**PRAGMATIC PRESUPPOSITION:** The set of propositions lexicogrammatically evoked in an utterance which the speaker assumes the hearer already knows or believes or is ready to take for granted at the time of speech. (52)

**PRAGMATIC ASSERTION:** The proposition expressed by a sentence which the hearer is expected to know or believe or take for granted as a result of hearing the sentence uttered. (52)

Lambrecht's pragmatic assertion corresponds to Gundel's notion of comment. The focus of an utterance is the part that is asserted in a declarative utterance or questioned in an interrogative utterance.

**FOCUS, or FOCUS OF THE ASSERTION:** The semantic component of a pragmatically structured proposition whereby the assertion differs from the presupposition. (213)

These distinctions will be exemplified in the next sections in the discussion of patterns of information distribution and their morphosyntactic realization in different languages.

## 3.2 Focus structure and focus types

Information distribution in sentences is of concern to syntacticians only to the extent that it has morphosyntactic expression and ramifications. The grammatical system which serves to indicate the scope of the assertion in an utterance in contrast to the pragmatic presupposition is termed the 'focus structure' by Lambrecht. He characterizes it as follows:

**FOCUS STRUCTURE:** The conventional association of a focus meaning [distribution of information] with a sentence form. (1994:222)

A major component of his theory of focus structure is a taxonomy of focus types. The fundamental contrast is between broad and narrow focus; in narrow focus the focus domain extends over only a single constituent, e.g. an NP, while in broad

focus it encompasses more than one constituent. There are two kinds of broad focus, predicate focus and sentence focus.

Predicate focus is universally the unmarked type and coincides with the traditionally recognized ‘topic-comment’ organization of information in a sentence. Lambrecht (2000) gives the following definition.

*Predicate focus structure:* Sentence construction expressing a pragmatically structured proposition in which the subject is a topic (hence within the presupposition) and in which the predicate expresses new information about this topic. The focus domain is the predicate phrase (or part of it). (2000:615)

The following examples from English, Italian, French, Croatian and Japanese illustrate predicate focus constructions; the constituent bearing focal stress is in all caps.

- (3.1) Q: How’s your car?
- |       |                                 |          |
|-------|---------------------------------|----------|
| A: a. | My car / it broke DOWN.         | English  |
| b.    | (La mia macchina) si è ROTTA.   | Italian  |
| c.    | (Ma voiture) elle est en PANNE. | French   |
| d.    | Auto se POKVARIO / POKVARIO se. | Croatian |
| e.    | (Kuruma wa) KOSYOO-si-ta.       | Japanese |

In each of these examples, there is an NP functioning as topic; it is the subject NP in English, Italian and Croatian, the detached NP in French, and the *wa*-marked NP in Japanese. The syntactic variation across these five languages highlights the problem with the term ‘subject’ in Lambrecht’s definition; as he himself notes, the term as used here should not be construed narrowly as referring to grammatical subjects only but must include detached NPs as in French and Japanese. The information structure of the English example can be represented as follows (Lambrecht 1994:226):

- (3.2)
- |                 |   |
|-----------------|---|
| Sentence:       | <i>My car broke DOWN.</i>                             |
| Presupposition: | ‘Speaker’s car is available as a topic for comment x’ |
| Assertion:      | ‘x = broke down’                                      |
| Focus:          | ‘broke down’  |
| Focus domain:   | Verb plus remaining post-verbal core constituents     |

Sentence focus constructions differ strikingly from predicate focus constructions, in that they have no topical subject; the focus domain is the entire sentence. Lambrecht exemplifies this focus type with the following examples.

- (3.3) Q: What happened?
- |       |   |
|-------|---|
| A: a. | My CAR broke down.                          |
| b.    | Mi si è rotta la MACCHINA.                  |
| c.    | J’ai ma VOITURE qui est en PANNE.           |
| d.    | Pokvario mi se AUTO. / AUTO mi se pokvario. |
| e.    | KURUMA ga KOSYOO-si-ta.                     |

The entire sentence is being asserted; there is no presupposed topic, as in (3.1). The most common use of this focus type is presentational constructions, as in (3.4).

- (3.4) a. Once upon a time there was an old man and a dog.  
 b. Then out from under the bed ran a mouse.  
 c. There arose a violent storm.

These sentences lack an established topic, and they serve to introduce new participants into the discourse. The subject NP appears in the postverbal position normally reserved for objects, the unmarked focus constituent in a predicate focus construction.<sup>2</sup> In Italian the subject must appear postverbally in this construction, while in French it appears after a kind of ‘dummy’ verb, due to the lack of the kind of subject-inversion construction found in Italian. In Japanese, the particle marking the subject changes from *wa* to *ga*. In Croatian, the Italian and English options are both available. Lambrecht (2000) gives the following characterization of sentence focus constructions.

*Sentence focus structure:* Sentence construction formally marked as expressing a pragmatically structured proposition in which both the subject and the predicate are in focus. The focus domain is the sentence, minus any topical non-subject arguments. (2000:617)

The analysis of the English sentence focus example in (3.3) may be laid out as in (3.5).

- (3.5) Sentence: *My CAR broke down.*  
 Presupposition: None  
 Assertion: ‘Speaker’s car broke down’  
 Focus: ‘Speaker’s car broke down’  
 Focus domain: Clause

The final focus type is narrow focus, in which the focus domain is a single constituent; it may be subject, object, an oblique, or even the verb.<sup>3</sup> Examples from Lambrecht are given in (3.6).

- (3.6) Q: I heard your motorcycle broke down?  
 A: a. My CAR broke down. / It was MY CAR that broke down.  
 b. Si è rotta la mia MACCHINA. / È la mia MACCHINA che si è rotta.  
 c. C’est ma VOITURE qui est en panne.  
 d. AUTO mi se pokvario. / Pokvario mi se AUTO.  
 e. KURUMA GA kosyoo-si-ta.

Here there is a definite presupposition associated with the sentence, ‘something broke down’, and the assertion is that it is the speaker’s car rather than something

<sup>2</sup> See Lambrecht (2000) for a detailed discussion of the properties of sentence focus constructions cross-linguistically.

<sup>3</sup> Lambrecht (1994, 2000) refers to this focus type as ‘argument focus’; however, the term ‘narrow focus’, from Lambrecht (1986), will be used here, since it is possible to have narrow focus on adjuncts as well as arguments.

else. Hence the focus domain is restricted to the NP *car*. In English and Croatian, the subject is stressed, and in Japanese the subject and the particle *ga* are stressed. Italian, English and French can use cleft constructions here,<sup>4</sup> and Italian and Croatian also have the option of using an inverted subject.

- (3.7)        Sentence:        *My CAR broke down.*  
                Presupposition: 'Speaker's x broke down'  
                Assertion:        x = 'car'  
                Focus:            'car'  
                Focus domain: NP

Lambrecht (1986) distinguishes unmarked narrow focus from marked narrow focus, the difference being where the narrow focus falls: if it falls on the final constituent in the core in English, then it is unmarked, whereas if it falls to the left or to the right of that, it is marked. This is illustrated in (3.8).

- (3.8) a.        Leslie sent the book to DANA yesterday.  
                b.        Leslie sent the book to Dana YESTERDAY.  
                c.        Leslie sent THE BOOK to Dana yesterday.  
                d.        Leslie SENT the book to Dana yesterday.  
                e.        LESLIE sent the book to Dana yesterday.

Thus narrow focus on an object is a case of unmarked narrow focus, while narrow focus on a subject is a case of marked narrow focus. Languages have different unmarked focus positions, depending largely, but not entirely, on their basic word order. In SVO languages, it is the last position in the core, e.g. as in English in (3.8), or the immediate postverbal position, e.g. in Chicheŵa (Bresnan and Kanerva 1989). In verb-final languages, the unmarked focus position is the immediate preverbal position (Kim 1988), e.g. Korean, Turkish. Some SOV languages make a distinction between unmarked predicate focus (i.e. verb + immediate postverbal XP) vs marked predicate focus (i.e. verb + more than one preverbal XP), e.g. Korean (Han 1999). In VOS languages, it is the immediate postverbal position, e.g. Toba Batak (Van Valin 1999b).

A very common example of a narrow focus sentence is a WH-question like *What did you buy?* and the answer *I bought —*; the WH-word and the NP filling its slot in the reply are both unmarked narrow foci. In a yes–no question like *Did JOHN leave?* and the response *No, FRED did*, *John* and *Fred* are marked narrow foci. There are further divisions that can be made in terms of types of narrow focus (e.g. Prince 1981a, Dik 1989, Bearth 1992), and a particularly significant one is between completive and contrastive narrow focus. Completive focus is the answer to a yes–no or WH-question, as in the examples above. Contrastive focus, on the other hand, involves an explicit choice among alternatives, as in (3.6). The two may co-occur in a single clause, as in (3.9).

<sup>4</sup> See Pavey (2004) for an analysis of *it*-clefts in RRG.



- (3.9) a. Who did Bill give THE BOOK to and who did he give THE MAGAZINE to?  
 b. He gave THE BOOK to MARY and THE MAGAZINE to SALLY.

In (3.9b), *the book* and *the magazine* are contrastive narrow foci, while *Mary* and *Sally* are completive narrow foci.

### 3.3 Morphosyntactic marking of focus structure

As is clear from the examples in (3.1), (3.3) and (3.6), languages employ different grammatical means for indicating the various focus constructions; syntax, morphology and prosody are all used. English makes use of both prosodic and syntactic devices. The basic mechanism is accentuation, with the main sentence stress falling on the primary focal element, as noted in section 3.2 (see also Erteschik-Shir and Lappin 1983; Selkirk 1984, 1995). English allows the focal stress to fall on any constituent in a sentence, and consequently the contrasts among the three focus types can be signalled solely prosodically. However, there are syntactic ways to mark them as well. Inversion may play a role in the presentational sentence focus construction, as in (3.4), and an *it*-cleft can be used to express narrow focus, e.g. *it was my car that broke down* (cf. (3.6a)).

Focus structure affects the type of referring expression that is selected to fill a variable position in LS, because the kind of referring expression that is chosen reflects the status of the referent in the discourse context. This is captured in Figure 3.1, which is based on proposals from Givón (1983), Levinson (1987), Ariel (1990), Gundel *et al.* (1993), Lambrecht (1994) and Fretheim and Gundel (1996). Zero coding is the least marked coding for a topic referent, while realization as an indefinite NP is the least marked coding for a focal referent. While indefinite NPs can be topics under special contextual circumstances, it is impossible for a focal referent to be realized as zero.

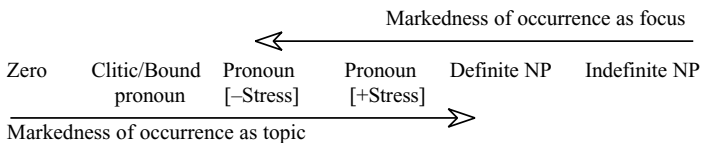


Figure 3.1 Coding of referents in terms of possible functions

Japanese uses primarily morphological means, the well-known particles *wa* and *ga*, to signal the different focus types. Kuno (1973) argues that (unstressed) *wa* is a topic marker, which accounts for its use in predicate focus constructions, and further that there are in fact two *ga* particles, neutral description *ga* (unstressed) and exhaustive listing *ga* (stressed). Neutral description *ga* is used in sentence focus constructions like (3.3e), as well as in predicate focus constructions in certain contexts (Shimojo 1995), while exhaustive listing *ga* is found in narrow

focus constructions. In Huallaga Quechua (Weber 1989), there is a topic marker *-qa*, and evidential clitics indicate the focus of the sentence. This is illustrated in (3.10).

- (3.10) a. Machka papa-ta-shi qara-n wamra-ta-qa.  
 mealy potato-ACC-EVID give-3sg child-ACC-TOP  
 'She [the witch] gave [her] mealy potatoes, the child.'
- b. Chawra machka papa-ta qara-pti-n-qa wamra-qa apta-rku-n-shi.  
 so mealy potato-ACC give-DS-3sg-TOP child-TOP grasp-DIR-3sg-EVID  
 'So when she gives [her] a mealy potato, the child, she grasps it.'

The NP in the preverbal position in (3.10a), *machka papa* 'mealy potato', bears the indirect evidence evidential clitic *-shi*, which along with its position, indicates that it is the focus of the sentence. In (b), the event in (a) is recapitulated as a topic-marked switch-reference clause, and the verb in the main clause, which is the focus, takes the evidential clitic. Thus morphological markers serve the same function as intonation and syntax in English in indicating the various focus constructions.

Italian and French both use syntactic means to distinguish among the three types, albeit differently, and in neither language is it possible to simply shift the focal stress to the preverbal subject position with no other change in the structure of the sentence, as is possible in English. Both employ the equivalent of *it*-clefts for narrow focus (3.6b,c), but sentence focus constructions are handled in distinct ways. In Italian the subject occurs immediately after the verb, as in (3.3b), while in French a bi-clausal construction is used in which the NP corresponding to the inverted subject in Italian is in the postverbal object position of the first clause and the substantive predicate of the sentence is in the second clause, as in (3.3c).

In neither language may a focal NP occur in preverbal position (within the core), unlike English, and such a constraint is relatively common cross-linguistically. In Mandarin Chinese (LaPolla 1990) a preverbal referential NP must be part of the pragmatic presuppositions associated with the utterance. Thus a simple sentence like (3.11a) can only be interpreted as having a presupposed, specific subject; with an indefinite NP, the existential verb *yǒu* normally appears before the NP, rendering it postverbal, as in (3.11b).

- (3.11) a. Rén zài nàr.  
 person be.at there  
 'The/\*a man is there.'
- b. Yǒu rén zài nàr.  
 exists person be.at there  
 'There's a person / someone there.'

A similar constraint holds in Kinyarwanda (Kimenyi 1980) and in the Sotho languages of southern Africa (Demuth 1989); in this group of languages, there is 'a constraint on subjects which restricts them to being highly topical, old, given

information' (1989:67). The following examples are from Setswana, one of the Sotho languages (Demuth 1990).

- (3.12) a. Monna o-bed-its-e mosimane.  
 man 3sg-beat-PRFV-MOOD boy  
 'The/\*a man beat a/the boy.'
- b. Mosimane o-bed-its-w-e ke monna.  
 boy 3sg-beat-PRFV-PASS-MOOD by man  
 'The/\*a boy was beaten by a/the man,' or 'A man hit the boy.'

The preverbal NPs in these sentences must be interpreted as presupposed, while the postverbal NP may or may not be presupposed. This constraint has the interesting result that because WH-words are always focal in a WH-question, it is impossible for them to appear in preverbal position, as the ungrammaticality of (3.13a) shows. Consequently, in order to formulate a WH-question in which the WH-word is interpreted as a 'subject', it is necessary to use a passive, as in (3.13b), or a cleft construction. These examples are from Sesotho (Demuth 1989).

- (3.13) a. \*Mang o-pheh-ile lijo?  
 who 3sg-cook-PRFV food  
 'Who cooked the food?'
- b. Lijo li-pheh-li-o-e ke mang?  
 food 3sg-cook-PRFV-PASS-MOOD by who  
 'The food was cooked by who?', 'Who cooked the food?'

This constraint brings out clearly the fact that where the focus may fall in a sentence varies across languages; in English it may be in any position within a clause, while in Italian, French and Setswana/Sesotho it is restricted to postverbal position. Unlike the Sotho languages, WH-words may appear in the precore slot in Italian and French. This means that the constraint against focal prenuclear material applies within the core, not the clause as a whole. In Setswana, on the other hand, it holds in the clause, thereby preventing the prenuclear occurrence of WH-words. It is therefore necessary to talk about the 'potential focus domain' [PFD], the syntactic domain in which focus elements may occur, when discussing focus structure in a language. It contrasts with the 'actual focus domain' [AFD], the part of the sentence that is actually in focus. In English, the potential focus domain is the clause, whereas in these other languages the potential focus domain does not include at least some preverbal positions. This notion will become extremely important in the discussion of the focus structure of complex sentences.

Some languages combine the morphological strategy of Japanese and Quechua with the syntactic strategy of French, Italian and the Bantu languages. Toura, a Mande language spoken in Ivory Coast (Bearth 1969, 1992), is just such a language. It exhibits relatively strict SOV order and has a number of means for expressing focus distinctions. The basic predicate-focus construction is exemplified in (3.14a), while two different types of focus marking are shown in (b)–(c).

- (3.14) a. Tìà ké gwéé lǎ'.  
PRDM peanuts buy  
'Tia BOUGHT PEANUTS.'
- b. Q: Tìà-' mæε lǎ' le?  
-PRDM what buy TM  
'WHAT did Tia buy?'
- A: Tìà-' gwéé-' lǎ' le.  
-PRDM peanuts-FOC1 buy TM  
'Tia bought PEANUTS.'
- b'. Q: Waa gwéé lǎ' le?  
who peanuts buy TM  
'WHO bought peanuts?'
- A: Tìà-' gwéé lǎ' le.  
-FOC1 peanuts buy TM  
'TIA bought peanuts.'
- c. Tìà ké gwéé-le lǎ'.  
PRDM peanuts-FOC2 buy  
'Tia bought PEANUTS.'

The focus marker in (b) is a tonal clitic (as is the predicate marker in many of these examples), while in (c) it is the same element that elsewhere is glossed 'TM'. The difference between the two types of focus concerns the presuppositions involved; the type of (b) is completive focus, while that in (c) has a more contrastive function. As in English, there is a precore slot and a left-detached position in Toura; they are illustrated in (3.15).

- (3.15) a. Gwéé-' Tìà-' lǎ' le.  
peanuts-FOC1 -PRDM buy TM  
'PEANUTS Tia bought', or 'It is PEANUTS (not, e.g., potatoes) that Tia bought.'
- b. Gwéé (lǎà), Tìà ké à lǎ'.  
peanuts (TOP) PRDM 3pl buy  
'As for peanuts, Tia bought them.'

The two positions differ in Toura just as they do in English and other languages that have them; there is no intonation break between the initial NP and the following material in (a), and there is no pronoun referring to the initial NP, whereas in (b) there is an intonation break between the initial NP and the following material and there is a resumptive pronoun referring to the initial NP. The NP in the precore slot in (a) carries a focus marker, while the NP in the left-detached position in (b) carries a topic marker. Thus, Toura presents an elaborated system of focus marking which employs both special positions (precore slot, left-detached position) and focus markers for core-internal elements.

This discussion raises an interesting typological point. In English, word order is very constrained and focus placement very flexible, whereas in Italian word order is very flexible and focus placement is very constrained. This contrast could be characterized in terms of how syntax and focus structure adapt to each other:

### 3.4 Formal representation of focus structure

Diagram illustrating the structure of a sentence and its focus domains:

**Sentence:** Chris presented a child with some flowers.

**Basic Information Units (IUs):** Chris, presented, a child, with some flowers.

**Tree Structure:**

- SENTENCE
  - CLAUSE
    - CORE
      - NP (Chris)
      - NUC (presented)
        - PRED
          - V
      - NP (a child)
      - PP (with some flowers)

**Focus Domains:**

- Actual Focus Domain:** Chris
- Potential Focus Domain:** Chris, presented, a child, with some flowers

**Speech Act:** SPEECH ACT

Figure 3.2 *Predicate focus in English*

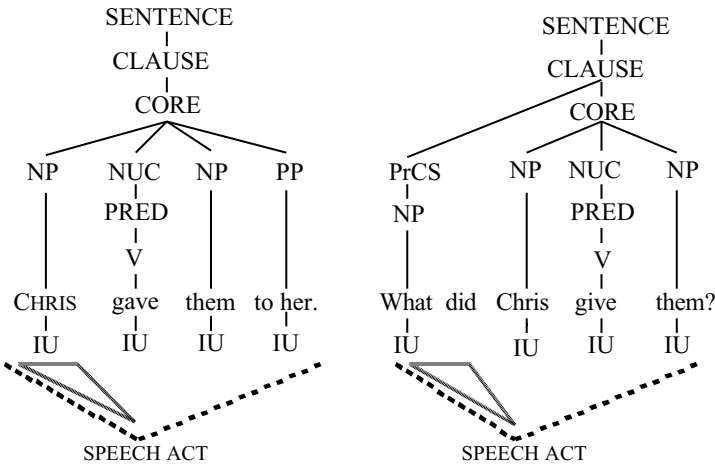


Figure 3.3 *Narrow focus in English*

these representations, the ‘IU’ nodes are the basic information units in the focus structure projection; Lambrecht (1994) argues that the minimal information unit corresponds to the minimal phrasal category in syntax. This notion will be of particular importance for the investigation of information structure in complex sentences in Chapter 6. Figure 3.2 is an example of predicate focus in English; the potential focus domain is the whole clause, and the actual focus domain is the nucleus plus the post-nuclear arguments. In Figure 3.3 two examples of narrow focus in English are given. It is possible to have two foci in a single clause, as shown in (3.9). In such a sentence there are two actual focus domains within the potential focus domain. This may be represented as in Figure 3.4.

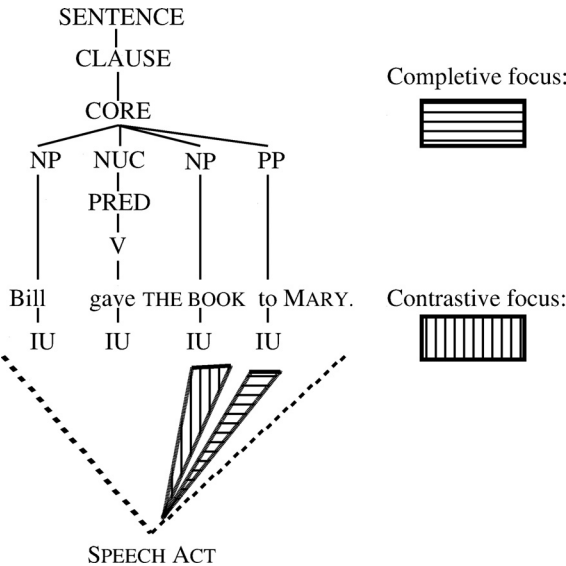


Figure 3.4 *Two types of narrow focus in a single clause, as in (3.9)*

Mandarin, like Italian and French, differs from English with respect to the potential focus domain in simple sentences, as noted above; in Figure 3.5, the structures of (3.16a) (predicate focus) and (3.16b) (sentence focus) are given.

- (3.16) a. Chē lái le.  
 vehicle come PRFV  
 'The car is here.'
- b. Lái chē le.  
 come vehicle PRFV  
 'There is a car coming.'

Unlike English, the potential focus domain is not coextensive with the clause in Mandarin, and the prenuclear element in (3.16a) is outside the potential focus domain.

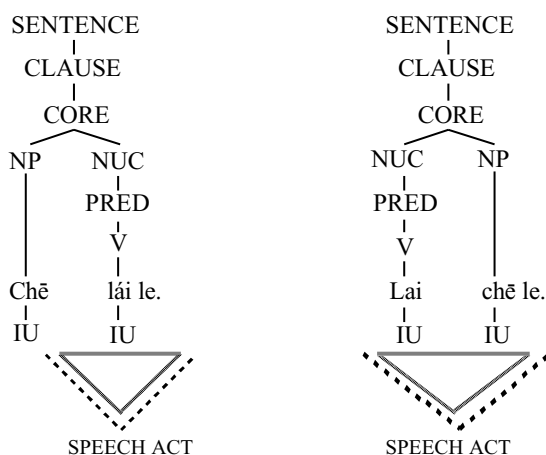


Figure 3.5 *Predicate focus and sentence focus in Mandarin*

All three projections may be combined into a single representation, as in Figure 3.6 on the next page. Each of these projections depicts information that is simultaneously present in the clause.

In addition to representing focus constructions in the layered structure of the clause, the activation level of the referents of the NPs filling the argument positions in logical structures will also be indicated. For simplicity's sake, only five levels of activation will be coded: active, i.e. actively under consideration in the discourse by means of direct mention; accessible, i.e. not actively under consideration but readily recognized by the addressee due either to knowledge of the world or to occurrence in the immediate environment of the speech situation; inactive, i.e. previously mentioned but not actively under consideration and not assumed by the speaker to be recognized by the addressee; brand new – anchored, i.e. not previously mentioned but related to something already mentioned or accessible; and brand new – unanchored, i.e. not previously mentioned or related to anything previously mentioned (Prince 1981b; Chafe 1987). Propositions may also have different levels of activation (Dryer 1996). In the dialogues in (3.1), for example,

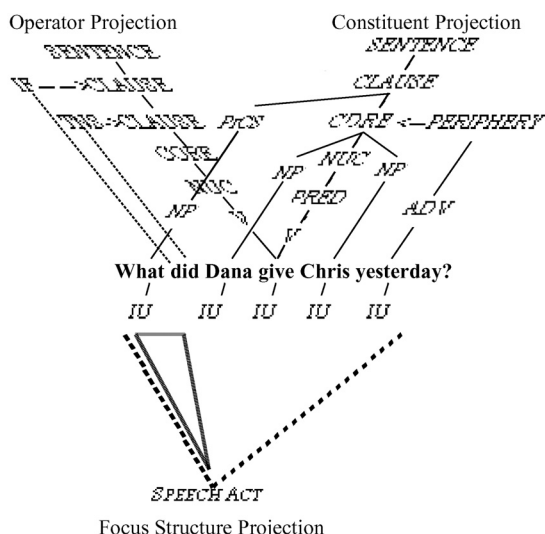


Figure 3.6 *Clause structure with constituent, operator and focus structure projections*

the speaker's car is made active by the initial question and is treated as such in the responses to it. In (3.2) the speaker's car is inactive, as it has not been mentioned in the previous discourse. In (3.6), the proposition 'speaker's x broke down' is activated, due to the question. An example of an accessible referent would be Bill Clinton, since a speaker of English could reasonably assume that their interlocutors would know who he is without him being previously mentioned in the immediate context. The different activation statuses will be indicated in LSs as in the following example, which assumes that the mayor of the city is already a topic referent established in the context.

- (3.17) a. The mayor sent Bill Clinton a letter.  
 b. [**do'** (mayor<sub>ACV</sub>, Ø)] CAUSE [BECOME **have'** (Bill Clinton<sub>ACS</sub>, letter<sub>BNU</sub>)]

The NP *the mayor* is activated, because its referent has already been mentioned, while the NP *Bill Clinton* is accessible, because its referent has not been mentioned but is assumed to be available to the interlocutors. Finally, the NP *a letter* is brand new – unanchored, because its referent has not been mentioned and is not assumed to be related to anything mentioned or available to the interlocutors. It will be shown in chapter 5 that different aspects of the linking algorithm are sensitive to the activation status of the referents of the NPs in logical structures.

### 3.5 Focus structure and the notion of VP

It was noted in section 1.2 that there is no analogue in the layered structure of the clause to the VP grouping which is basic to X-bar analyses of clause structure. However, a glance at the predicate focus constructions in



Figures 3.2 and 3.5 reveals that the actual focus domain in these constructions corresponds to what would be a VP in an X-bar analysis. Moreover, narrow focus constructions with subject focus, as in the English examples in Figure 3.3, also isolate a VP-like grouping. This is no accident. VPs, to the extent that they exist in languages, are the grammaticalization of focus structure; they are not primitive categories in clause structure. All languages have predicate and narrow focus constructions, but the same cannot be said for VPs. (Cf., e.g., Van Valin 1987; Mohanan 1982.) Lambrecht (2000) also shows that there is no evidence for an NP–VP bipartite structure in sentence focus constructions cross-linguistically. The clearest syntactic evidence for a VP-like category in English comes from imperatives, ‘VP fronting’, ‘VP deletion’ and ‘VP anaphora’, as in (3.18).

- (3.18) a. Open the door!  
 b. I expected to find someone mowing the lawn, and mowing the lawn was DANA.  
 c. Chris is having a tall latte, and Pat is, too.  
 d. Q: Who mowed the lawn?  
 A: DANA did.

In an imperative the subject is omitted, leaving the verb plus its object, a VP-like grouping. In information structure terms, unless there is contrastive stress on one of the elements, the whole utterance is in the actual focus domain of the utterance, and it corresponds to the actual focus domain of a predicate focus construction. In the other constructions, the ‘VP’ is overtly established in the discourse as topical; in (3.18b) the ‘VP’ is fronted in a sentence-focus presentational construction, while in (3.18c) it is omitted in the second clause. Example (3.18d) is a narrow focus construction with a focal subject and topical ‘VP’ (cf. Figure 3.3). In order to describe these constructions in RRG, the postulation of a VP-like category in the layered structure of the clause is unnecessary; the focus structure projection imposes these groupings on the constituent projection, and these constructions are sensitive to the pragmatically motivated bracketings of the syntactic structure. The projection grammar representation of the layered structure of the clause plus focus structure provides the basis for an explanatory representation.<sup>5</sup>

### 3.6 Focus structure and the interpretation of quantifier scope

The issue of the interpretation of sentences containing multiple quantifiers has long been an important topic in the study of syntax and semantics. Consider the following well-known example from English.

<sup>5</sup> See section 7.1 for an account of ‘VP’ ellipsis which does not use the notion of VP.

- (3.19) a. Every girl kissed a boy.  
 b. (i) Each girl kissed a different boy ('for each girl there is a boy such that the girl kissed the boy', i.e.  $[\forall x, \exists y (\text{kiss}' x, y)]$ , where  $x$  = girl and  $y$  = boy)  
 (ii) Each girl kissed the same boy ('there is a boy such that for each girl, the girl kissed the boy', i.e.  $[\exists y, \forall x (\text{kiss}' x, y)]$ , where  $x$  = girl and  $y$  = boy)  
 c. A boy was kissed by every girl. (= (bii), (bi))

Sentence (3.19a) is ambiguous in English, and the two interpretations are given in (3.19b). A number of linguists (e.g. Sgall, Hajičová and Panevová 1986; Kuno 1991; Kuno *et al.* 1999; Van Valin and LaPolla 1997) have proposed that focus structure strongly affects the interpretation of quantifiers. The principle they propose can be formulated as in (3.20).

- (3.20) Principle affecting quantifier scope interpretation: topical Q > focal Q  
 a. Every girl KISSED A BOY. =(3.19b(i))  
 b. EVERY GIRL kissed a boy. =(3.19b(ii))

This principle states that (everything else being equal) a topical quantifier will have wide scope over a focal quantifier. This predicts that in a sentence like (3.19a), the default interpretation should correlate with the default focus structure, predicate focus, depicted in (3.20a). Since the universal quantifier is topical and the existential quantifier focal in (3.20a), the preferred reading should be that in (3.19b(i)), which is correct. In order to get the secondary reading in (3.19b(ii)), it is necessary to interpret (3.19a) as if it were a narrow focus construction, as in (3.20b). In this case, the existential quantifier is topical and the universal quantifier focal, and consequently the former will have wide scope, yielding the interpretation in (3.19b(ii)). This contrast is represented in Figure 3.7.

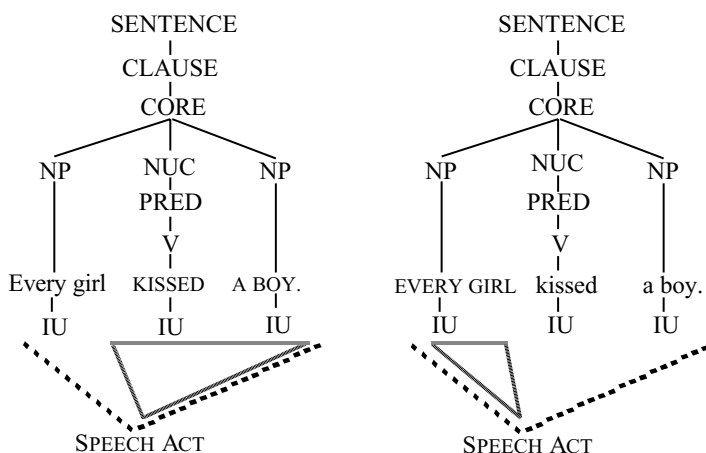


Figure 3.7 *Predicate focus vs narrow focus in the interpretation of quantifiers*

While this analysis can account for (3.19), is there any reason to prefer it over a purely syntactic analysis? Does it make any significant predictions? The principle in (3.20), together with the theory of focus structure in section 3.2, makes interesting predictions about the interpretation of quantifiers in Italian, Japanese and Mandarin. Consider the Italian equivalents of (3.19a,c) in (3.21), taken from Melinger (1996).

- (3.21) a. Ogni ragazza ha baciato un ragazzo.  
 Every girl has kissed a boy  
 'Every girl kissed a boy.' = (3.19b(i)), ≠ (3.19b(ii))
- b. Un ragazzo è stato baciato da ogni ragazza.  
 a boy is been kissed by every girl  
 'A boy was kissed by every girl.' = (3.19b(ii)), ≠ (3.19b(i))

The sentence in (3.21a) is the Italian translation of (3.19a), and (3.21b) is the translation of (3.19c). Unlike their English counterparts, these sentences are unambiguous: (3.21a) can only have the reading of (3.19b(i)), while (3.21b) can only have the reading of (3.19b(ii)). The lack of ambiguity is predicted by the principle in (3.20), given the analysis of the potential focus domain in Italian based on the examples in (3.3b) and (3.6b). It was pointed out in section 3.3 that in Italian, a focal core argument cannot be preverbal inside the core; in particular, a focal subject cannot occur preverbally but must be in a postverbal position. This precludes the possibility of narrow focus on a preverbal subject, which, as argued with respect to (3.20b), is what is required to derive the (3.19b(ii)) interpretation from (3.19a). Hence (3.21a) must be unambiguous, with the only possible reading being the one with the universal quantifier (*ogni*) having wide scope. For the same reason (3.21b) must also be unambiguous, and the only possible reading is the one with the existential quantifier (*un*) having wide scope. The RRG representations for (3.21a) and (3.21b) are given in Figure 3.8. The critical difference between the English structures in Figure 3.7 and the Italian ones in Figure 3.8 is the potential focus domain: it includes the subject in English but not in Italian. This difference, together with the principle in (3.20), correctly predicts the ambiguity in the English sentences and the lack of ambiguity in their Italian counterparts.

Whether a Japanese subject is marked with *wa* vs *ga* has implications for the interpretation of quantifiers, following (3.20). *Wa* marks topics, as in (3.1e), but *ga* can mark both focal and topical subjects. Its use with focal subjects is illustrated in (3.3e) and (3.6e). Shimojo (1995) shows that when both the subject referent and the content of the proposition are established in discourse, i.e. neither is focal, then *ga* is the preferred marker for the subject. Following on the principle in (3.20), it may be predicted that the Japanese analogues of sentences like (3.19a) will be unambiguous, if the subject NP containing a quantifier is marked by *wa*, and will be ambiguous, if the subject NP is marked by *ga*. This is the case, as the sentences in (3.22) show (Watanabe 1995).

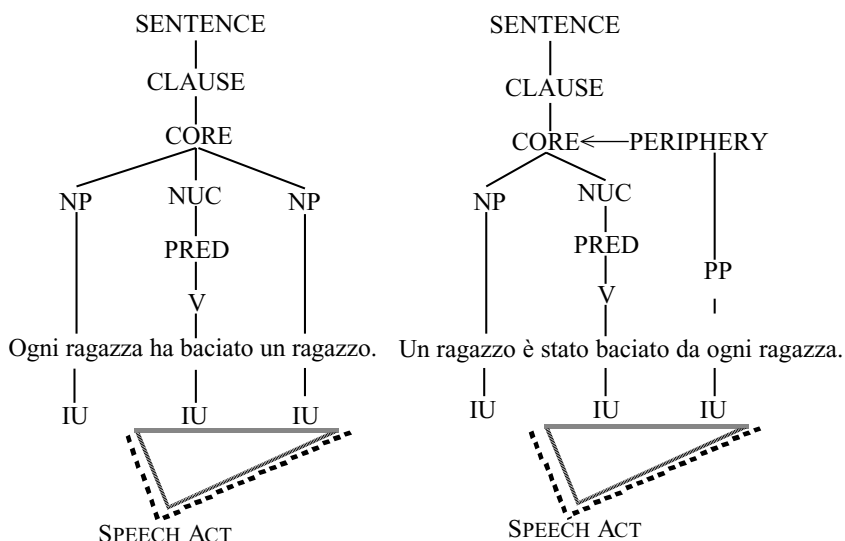


Figure 3.8 *Italian focus structure and the scope of quantifiers*

- (3.22) a. Subete no hito ga dareka o aisiteiru.  
 every GEN person NOM someone ACC loves  
 'Everyone loves someone.' = (3.19b(i)), (3.19b(ii))
- b. Subete no hito wa dareka o aisiteiru.  
 every GEN person TOP someone ACC loves  
 'Everyone loves someone.' = (3.19b(i)), ≠ (3.19b(ii))

When the quantified subject is marked by *ga*, as in (3.22a), it may be construed as topical or focal, and consequently either quantifier may be interpreted as having wide scope. When it is marked by *wa*, as in (3.22b), it must be topical, and as Shimojo (1995) shows, the remainder of the clause must be focal in the classic topic–comment (predicate focus) structure. Hence (3.22b) can have only the (3.19b(i)) reading with the subject quantifier having wide scope. If the subject NP is omitted due to high topicality, as in (3.23a), in which a group of people as a whole has been activated, then it gets the same interpretation as in (3.22b), whereas when the subject is not marked by *wa* or *ga*, as in (3.23b), then the sentence is ambiguous, as in (3.22a) (M. Shimojo, personal communication).

- (3.23) a. Dareka o aisiteiru.  
 someone ACC loves  
 '[Everyone] loves someone.' = (3.19b(i)), ≠ (3.19b(ii))
- b. Minna-Ø dareka o aisiteiru.  
 everyone someone ACC loves  
 'Everyone loves someone.' = (3.19b(i)), (3.19b(ii))

The RRG account also provides an answer to an intriguing puzzle involving quantifier scope in Mandarin Chinese; the relevant examples are given below (Huang 1982; Aoun and Li 1993).

- (3.24) a. Měi ge rén dōu xǐhuan yī ge nǚrén.  
 every CL person all like one CL woman  
 ‘Everyone likes a woman.’ (= ‘everyone likes a different woman’, ≠  
 ‘everyone likes the same woman’)
- b. Měi ge rén dōu bèi yī ge nǚrén dǎsǐ-le.  
 every CL person all by one CL woman beat.die-PRFV  
 ‘Everyone was killed by a woman.’ (= ‘everyone was killed by a different woman’, ‘everyone was killed by the same woman’)

In the English active–passive pair in (3.19a,c), both are ambiguous, and in the Italian active–passive pair in (3.21), both are unambiguous. The Mandarin sentences in (3.24) are also an active–passive pair, and, curiously, they differ in their readings: the active sentence is unambiguous, with the only possibility being wide scope for the subject quantifier, whereas the passive sentence is ambiguous, with either quantifier having wide scope. Why should this be the case? The answer lies in the potential focus domain in Mandarin and a feature of the Mandarin passive that is quite different from its English and Italian counterparts. As shown in section 3.3, the potential focus domain is restricted to the verb and postverbal constituents in Mandarin as in Italian (see (3.11), (3.16) and Figure 3.5).<sup>6</sup>

In (3.24a), the active sentence, there is NP-V-NP word order, and given the restriction on the potential focus domain in Mandarin and the principle in (3.20), we would predict that a preverbal subject quantifier would always have wide scope, and this is in fact the case. In the passive sentence in (3.24b), on the other hand, the word order is NP-PP-V; crucially, the Mandarin equivalent of the passive ‘by-phrase’ occurs *before* the verb, and consequently both quantified NPs are preverbal. This means that there is no inherent topic–focus asymmetry between them, as in SVO sentences; either NP may be considered the main topic, and consequently either can have wide scope.

There is an important additional consideration in determining the scope of quantifiers, namely, the referential properties of the quantifiers themselves. Ioup (1975) proposed a quantifier hierarchy, which is derived from the study of quantifier scope in more than a dozen languages; it is meant to capture the propensity of each quantifier to take wide scope. The quantifier hierarchy in Table 3.1 is the modified version of Ioup’s hierarchy proposed in Kuno *et al.* (1999). Ioup suggests that *each*, as the highest ranking quantifier, should always have wide scope.

<sup>6</sup> It should be noted that both languages make exceptions for WH-words in questions. WH-words are always focal in questions. In Italian WH-words occur at the beginning of the sentence, just as they do in English. In Mandarin, on the other hand, WH-words occur *in situ*, and subject WH-words appear in the normal subject position before the verb. The restrictions discussed in this chapter apply to non-WH-elements in these two languages.

Table 3.1 *Quantifier hierarchy from Ioup (1975) and Kuno et al. (1999)*

<i>each</i> > <i>a</i> > <i>some</i> (+NPsg) > <i>every</i> > <i>all</i> > <i>most</i> > <i>many</i> > <i>several</i> > <i>some</i> (+NPpl) > <i>a few</i>	
Greatest inherent tendency	Least inherent tendency
toward wide scope	
Greatest individuation, specificity	Least individuation, specificity

There is a link between Ioup’s quantifier hierarchy and the principle in (3.20), because the quantifiers at the top of the hierarchy involve greater individuation and specificity of the NP; the more specific the reference of an NP is, the better it is as a potential topic, and accordingly, the quantifiers at the top of the hierarchy would yield quantified NPs which would make better topics than those at the bottom.

An example of the interaction of the quantifier hierarchy with focus structure in the determination of quantifier scope can be found in the following facts from Toba Batak, an Austronesian language spoken in Indonesia (Clark 1985; W. Manik, personal communication). Toba Batak is a VOS language, and it is one of the few languages in which the basic focus structure pattern is comment–topic. The position immediately following the verb is the unmarked focus position in the clause, and positions following it, including the subject position, may be topical or focal; the default is for the subject position to be topical. In a simple sentence with two quantified NPs, the subject NP has scope over the object NP, and the resulting sentence is unambiguous.

- (3.25)      Manjaha buku angka guru.  
              read    book every teacher  
              ‘Every teacher read a book.’ (= ‘every teacher read a different book’, ≠  
              ‘every teacher read the same book’)

In this example both the quantifier hierarchy and the principle in (3.20) favour the wide-scope interpretation of *angka guru* ‘every teacher’; *buku* ‘book’ must be construed as non-specific. The basic interaction between the quantifier hierarchy and the pragmatic principle in (3.20) is this: when the higher ranking quantifier is also more topical, then the result should be unambiguous, but when the higher ranking quantifier is more focal and the lower ranking one is more topical, then ambiguity should result. The interesting data to be accounted for are given in (3.26)–(3.27).

- (3.26) a.    Mangalean missel tu tolu soridadu ganup jeneral. [Unambiguous, *ganup* > *tolu*]  
              give        missile to three soldiers each general  
              ‘Each general is giving a missile to three soldiers.’  
              (I.e. ‘each general is giving a missile to a different group of three soldiers’)

- b. Mangalean missel tu tolu soridadu angka jeneral. [Ambiguous]  
 ‘Every general is giving a missile to three soldiers.’  
 (I.e. ‘every general is giving a missile to a different group of three soldiers,’  
 or ‘every general is giving a missile to the same group of three soldiers’)
- c. \*Diilean ganup jeneral tu tolu soridadu missel.  
 ‘Each general gave a missile to three soldiers.’
- d. Diilean angka jeneral tu tolu soridadu missel. [Ambiguous]  
 ‘Every general gave a missile to three soldiers.’
- (3.27) a. Tu tolu soridadu, mangalean missel ganup jeneral [Ambiguous]  
 ‘To three soldiers, each general is giving a missile.’
- b. Tu tolu soridadu, mangalean missel angka jeneral. [Unambiguous, *tolu* > *angka*]  
 ‘To three soldiers, every general is giving a missile.’  
 (I.e. ‘every general is giving a missile to the same group of three soldiers’)

In (3.26a), the NP containing *ganup* ‘each’ is in final position, which has a default interpretation as topical; hence it has wide scope, because it is the highest ranking quantifier and is topical. In (b), on the other hand, the final NP contains *angka* ‘every’, and the NP containing *tolu* ‘three’ is not in the immediately postverbal focus position. Hence neither NP is necessarily focal, and *angka* is higher on the quantifier hierarchy than *tolu* ‘three’ but is not as high as *ganup* ‘each’. The default interpretation should therefore be *angka* ‘every’ > *tolu* ‘three’, but since neither NP must be interpreted as focal, it is possible to interpret *tolu* ‘three’ as more topical and therefore give it wide scope over *angka* ‘every’. In (d), the higher ranking quantifier (*angka* ‘every’) is in the focus position, while the lower ranking quantifier (*tolu* ‘three’) is in the default topic position. Each quantifier has one ‘wide-scope factor’ in its favour, and the result is scope ambiguity, as predicted. In (c), on the other hand, the highest ranking quantifier, *ganup* ‘each’, occurs in the focus position after the verb; the result is ungrammatical. Why should *angka* ‘every’ but not *ganup* ‘each’ be possible in this position? The answer lies in the link between the quantifier hierarchy and topicality mentioned earlier: NPs marked by ‘each’ are highly individuated and readily interpreted as topics. Hence there is a conflict between the inherently topical nature of *ganup jeneral* ‘each general’ and its occurrence in the focus position.

The two examples in (3.27) involve a quantified NP in a left-detached, initial topic position, and both Kuno and Ioup claim that occurring in a special topic position is a strong factor in favour of wide scope. In (a) the quantifier *tolu* ‘three’ is in the topic position and *ganup* ‘each’ is in final position, also a topical position. It appears that occurring in the special topic position is such a strong factor in favour of wide scope that it balances the fact that the clause-internal quantifier is *ganup* ‘each’, yielding an ambiguous sentence. When the clause-internal quantifier is lower on the quantifier hierarchy than *ganup* ‘each’, as in (b), the result is an unambiguous sentence, with the quantifier in the special topic position having wide scope.

It is clear, then, that information structure, the quantifier hierarchy and syntactic position interact in determining the relative scopes of quantifiers in multiple quantifier sentences in Toba Batak. Thus, the theory of focus structure presented in this chapter, the principle in (3.20), and the quantifier hierarchy together provide an explanatory account for the facts regarding quantifier scope interpretation in the English, Italian, Japanese, Mandarin and Toba Batak data presented in this section.



## 4 Syntactic relations and case marking

### 4.0 General considerations

An important locus of the interaction of syntax, semantics and pragmatics is grammatical relations. RRG takes a rather different view of grammatical relations from other theories. In the first place, it does not consider them to be basic, nor does it derive them from structural configurations. Second, it recognizes only one syntactic function, not up to three like other theories; there is nothing in RRG corresponding to notions like direct object and indirect object. The syntactic function posited in RRG is not, therefore, part of the same system of oppositions as the traditional notions of grammatical relations (i.e. subject vs direct object vs indirect object), and consequently it is not really comparable to the traditional notion that is its closest analogue, subject. Third, RRG does not assume that grammatical relations are universal, in two senses. On the one hand, it does not claim that all languages must have grammatical relations in addition to semantic roles, which are universal. On the other hand, in those languages in which a non-semantic grammatical relation can be motivated, the syntactic function posited need not have the same properties in every language; that is, the role of this syntactic function in the grammar of language *X* may be very different from that played by the syntactic function in language *Y*, and, consequently, the two cannot be considered to be exactly the same. Variation in grammatical relations systems is directly related to differences in the syntax–semantics–pragmatics interface across languages.

### 4.1 Do all languages have grammatical relations?

Most syntactic theories postulate that each of the core arguments bears some kind of grammatical relation, in addition to its semantic relation. The justification for positing syntactic relations in a language in addition to semantic predicate–argument relations is that there are phenomena in the language in which the distinction between two or more semantic roles is neutralized for syntactic purposes. A very simple example of this can be found in English: the verb agrees with the first NP in the core, regardless of whether it is actor or undergoer, i.e. whether it is the actor of an active-voice transitive verb, as in (4.1a), the undergoer of a passive-voice transitive verb, as in (4.1e), the actor of an intransitive verb,

as in (4.1b), or the undergoer of an intransitive verb, as in (4.1c); hence the contrast between actor and undergoer is neutralized here.<sup>1</sup> This is summarized in (4.1).

- |          |  |   |
|----------|--|---|
| (4.1) a. | The teacher has read the words.          | Actor of transitive V                     |
| b.       | The teacher has sung.                    | Actor of intransitive V                   |
| c.       | The teacher has fainted.                 | Undergoer of intransitive V               |
| d.       | *The teacher have read the words.        | *Undergoer of transitive V [active voice] |
| e.       | The words have been read by the teacher. | Undergoer of transitive V [passive voice] |

The contrast between (4.1d) and (e) shows that the issue is not semantic; in both examples, the word triggering agreement is the undergoer of *read*. Rather, the crucial difference is the syntactic function of the NP: it is a direct object in (d) but a subject in (e). Hence the determination of the trigger for verb agreement is syntactic, not semantic. However, there is no general neutralization of the opposition among arguments bearing semantic roles; the neutralization is restricted to actor and undergoer and does not apply to every argument bearing a thematic relation to the predicate. This is, therefore, a restricted neutralization of semantic roles for syntactic purposes, and it is evidence for the existence of a syntactic predicate–argument relation in addition to the semantic relations of actor and undergoer. Most languages have phenomena such as these which motivate the postulation of grammatical relations in addition to semantic roles.

Acehnese (Austronesian, Sumatra) is an example of a language in which this kind of restricted neutralization is not found, and accordingly there are no grounds for positing grammatical relations of any kind in addition to semantic roles, according to Durie (1985, 1987). In this language, statements of grammatical phenomena make reference to actor, to undergoer, or to core status; there is no construction in Acehnese which exhibits the kind of restricted neutralization of the actor–undergoer opposition of the kind described for English above. Verb ‘agreement’ (actually cross-reference, as this is a head-marking language) is sensitive to whether an argument is actor or undergoer, regardless of the transitivity of the verb; this is in sharp contrast to the situation in English, for example.<sup>2</sup>

- |          |  |   |
|----------|--|---|
| (4.2) a. | Gopnyan geu-mat lôn. / geu-mat-lôn. <sup>3</sup><br>3sg      3A-hold 1sg / 3A-hold-1sgU<br>‘(S)he holds me.’ | NP <sub>A</sub> A-V(-U) NP <sub>U</sub> |
| b.       | (Lôn) lôn-mat gopnyan.<br>1sg    1sgA-hold 3sg<br>‘I hold him/her.’  | NP <sub>A</sub> A-V(-U) NP <sub>U</sub> |

<sup>1</sup> The same principle applies to inverted constructions like those in (4.18) and (4.19), discussed below, because the postverbal NP is still the first NP in the core.

<sup>2</sup> All Acehnese examples are from Durie (1985, 1987). In the clause structure schemata on the right, ‘NP<sub>A</sub>’ = Actor NP, ‘NP<sub>U</sub>’ = undergoer NP, ‘A-’ = actor proclitic, ‘-U’ = undergoer enclitic.

<sup>3</sup> The undergoer clitic cannot occur if the verb is immediately followed by the undergoer NP, unless the NP is marked by the focus particle *di*.

- c. (Gopnyan) *geu-jak*. / \**gopnyan jak(-geuh)*.     $\text{NP}_A \text{ A-V} / * \text{NP}_U \text{ V(-U)}$   
 3sg        3A-go                                  go(-3U)  
 ‘(S)he goes.’
- d. (Lôn) *lôn-jak*. / \**lôn jak(-lôn)*                                   $\text{NP}_A \text{ A-V} / * \text{NP}_U \text{ V(-U)}$   
 1sg    1sgA-go                                  go(-1sgU)  
 ‘I go.’
- e. Gopnyan *rhêt(-geuh)*. / \**gopnyan geu-rhêt*     $\text{NP}_U \text{ V(-U)} / * \text{NP}_A \text{ A-V}$   
 3sg        fall(-3U)                                  3A-fall  
 ‘(S)he falls.’
- f. Lôn *rhêt(-lôn)* / \**lôn lôn-rhêt*                                   $\text{NP}_U \text{ V(-U)} / * \text{NP}_A \text{ A-V}$   
 1sg    fall(-1sgU)                                  1sgA-fall  
 ‘I fall.’

The contrast between actor and undergoer in an Acehnese clause is coded primarily in the clitic pronouns on the verb: the obligatory proclitic indicates the person, number and social status of the actor (*geu-* codes a familiar third person argument, *ji-* one of higher social status), while the optional enclitic signals the same information about the undergoer. Note that the form of the clitic pronouns is the same in both instances; only position distinguishes actor from undergoer. The distinction between actor and undergoer is preserved with intransitive verbs, as (4.2c–f) show; *jak* ‘go’ takes only the actor proclitics, while *rhêt* ‘fall’ takes only the optional undergoer enclitics. In other words, the verb always agrees with actors and undergoers the same way regardless of the transitivity of the verb; hence there is no neutralization of the actor–undergoer opposition in agreement (cross-reference).

The actor–undergoer contrast expressed in the verbal cross-reference is maintained in the syntax. In control constructions with verbs like *tém* ‘want’, for example, the omitted argument in the dependent core is always the actor. This is illustrated in (4.3).

- (4.3) a. Gopnyan *geu-tém* [(*\*geu-*)*jak*].                                  Actor of intransitive V  
 3sg        3A-want    (*\*3A-*)go  
 ‘(S)he wants to go.’
- b. Geu-tém [(*\*geu-*)*taguen bu*].                                  Actor of transitive V  
 3-want    (*\*3A-*)cook rice  
 ‘She wants to cook rice.’
- c. \*Gopnyan *geu-tém* [*rhêt*].                                  \*Undergoer of intransitive V  
 3sg        3A-want    fall  
 ‘(S)he wants to fall.’
- d. \*Aneuk *agam nyan ji-tém* [*geu-peuréksa lé dokto*].    \*Undergoer of transitive V  
 child    male    that    3A-want    3A-examine by doctor  
 ‘That child wants to be examined by the doctor.’<sup>4</sup>

<sup>4</sup> The passive translation should not be taken to indicate that the Acehnese construction is a passive. Durie (1985, 1988) shows that this construction is an active sentence with a postposed actor *dokto* ‘doctor’; note that the actor is still cross-referenced on the verb in the usual way by a proclitic. *Aneuk agam nyan* ‘that boy’ is the actor of *tém* ‘want’ and the undergoer of *peuréksa* ‘examine’.

There are also constructions in Acehnese in which the relevant restriction is stated in terms of undergoer, rather than actor (or subject). Possessor ascension is illustrated in (4.4).

- The occurrence of a possessor NP (*lôn* in (4.4a,b)) outside of the possessive NP (*até lôn* ‘my liver’ in (4.4a)) is possible only if the possessive NP functions as the undergoer of the clause; as (4.4e) shows, this is not possible when the possessive NP serves as actor.

All of the Acehnese phenomena discussed so far involve restrictions (actor-only or undergoer-only) but no neutralizations. Several major constructions are sensitive only to whether the argument in question is a core argument, e.g. NP fronting, raising, and relativization; it makes no difference whether the argument is actor, undergoer or what Durie labels a 'dative argument'. Here the actor-undergoer opposition is indeed neutralized, but there is no restriction. Hence it is not a restricted neutralization, unlike the one from English regarding verb agreement discussed above; 'any core argument' is not a grammatical relation. That is, the English neutralization nullifies the actor-undergoer contrast, and it applies only to macrorole arguments; it is not a general neutralization, in that macrorole arguments are still singled out for special treatment in this construction.

(4.5) a.	Gopnyan teuntèe [geu-woe]. 3sg        certain    3A-return '(S)he is certain to return.'	Actor of intransitive V
b.	Gopnyan teuntèe [meungang-geuh]. 3sg        certain    win-3U '(S)he is certain to win.'	Undergoer of intransitive V
c.	Gopnyan teuntèe [geu-beuet hikayat prang sabi]. 3sg        certain    3A-recite epic 'He is certain to recite the Prang Sabi epic.'	Actor of transitive V
d.	Hikayat prang sabi teuntèe [geu-beuet]. epic                                certain    3A-recite 'The Prang Sabi epic is certain to be recited by him.'	Undergoer of transitive V
e.	Gopnyan lôn-anggap [na neu-bi pèng baroe]. 3sg        1sg-consider    BE 2A-give money yesterday 'I believe him to have been given money by you yesterday.' (lit.: 'I consider him <sub>i</sub> [you gave money [to] — <sub>i</sub> yesterday].')	'Dative' of ditransitive V

Acehnese is very significant for theories of predicate–argument relations, for two reasons. First, it exemplifies the rare type of language in which there is no evidence for the postulation of grammatical relations in addition to semantic predicate–argument relations; it is therefore evidence that grammatical relations are not universal in the first sense discussed in section 4.0. Second, the generalizations regarding Acehnese syntax formulated by Durie would not be possible without macroroles. If they were stated in terms of thematic relations alone, each statement would include a disjunctive list of thematic relations, e.g. ‘possessor raising is possible only if the possessive NP functions as patient, theme, experiencer or locative in its clause’. The macrorole undergoer subsumes these thematic relations and thereby makes possible an elegant statement of this restriction.

## 4.2 Privileged syntactic arguments

Languages like Acehnese are very unusual; the vast majority of languages do provide evidence for the postulation of grammatical relations in addition to semantic roles. The traditional description of these phenomena is in terms of the grammatical relations of subject, direct object and indirect object, but the investigation of Philippine, ergative and active languages has shown that analyses based on the traditional approach and its modern derivatives are highly problematic.<sup>5</sup> The central concept in RRG for handling these phenomena is the ‘privileged syntactic argument of a grammatical construction’ [PSA]. It may be characterized as follows. In all languages there are syntactic constructions in which there are restrictions on the NPs and PPs (arguments and non-arguments) that can be involved in them; these restrictions define a privileged syntagmatic function with respect to that construction. In Acehnese these restrictions can be formulated in terms of either the specific semantic macroroles of actor and undergoer or the general syntactic notion of core argument. Hence the privileged syntagmatic function is semantically defined with respect to the constructions in (4.2)–(4.4). In languages like English, Icelandic and Dyirbal, on the other hand, there is a restricted neutralization of semantic roles with respect to the privileged syntagmatic function in most syntactic constructions. The restriction on arguments which can be involved in them is not characterizable in purely semantic-role terms, as in Acehnese; rather, it must be defined non-semantically, i.e. syntactically. The NP bearing the syntactically defined privileged syntagmatic function is the privileged syntactic argument of the construction. In order for a privileged syntactic argument to exist, there must be a restricted neutralization of semantic roles associated with the privileged function in the construction; if there is no restricted neutralization, as in Acehnese, then there are no grounds for positing specific non-semantic relations like subject and direct object. ‘Core argument’, while a syntactic status, does not define a specific argument relation like subject or direct object; it is neutralization without a restriction. In the English verb agreement examples in (4.1), the first NP in the core bears the defining syntactic function (it triggers verb agreement) and there is a restricted neutralization associated with it; it is therefore the privileged syntactic argument of the construction.

In the construction in (4.6), known as a ‘control construction’, there is a restricted neutralization with respect to the omitted argument in the infinitival core.

- |          |                                  |                             |
|----------|----------------------------------|-----------------------------|
| (4.6) a. | Chris wants to drink a beer.     | Actor of transitive V       |
| b.       | Chris wants to sing in the park. | Actor of intransitive V     |
| c.       | Chris wants to be stronger.      | Undergoer of intransitive V |

<sup>5</sup> See Van Valin (1981), Foley and Van Valin (1984, 1985), Durie (1987), Andrews (1985), Bhat (1991), Dryer (1997), among others, for detailed discussion.

- d. \*Chris<sub>i</sub> doesn't want the journalist      \*Undergoer of transitive V [active]  
to interview —<sub>i</sub>.
- e. Chris doesn't want to be interviewed      Undergoer of transitive V [passive]  
by the journalist.

In strictly syntactic terms, there is a missing argument in the linked core in (4.6); hence in (4.6) the privileged syntagmatic function defining the construction is that of the missing argument. In this construction there are restrictions on which argument can be omitted, as the (d) example shows. The missing argument in the linked core in (4.6a,b) is an actor, in (4.6c,e) an undergoer. In (4.6d), the missing argument has the same semantic role as in the grammatical (e) example; this is crucial evidence that the restriction cannot be stated in semantic role terms. The difference between (4.6d) and (e) concerns the syntactic treatment of the undergoer argument in the linked core. There is thus a restricted neutralization with respect to the omitted NP in (4.6), and it is the same one found in the discussion of verb agreement in (4.1). The privileged syntactic arguments of the two constructions discussed here are the same: they are what would be the core-initial argument in a simple clause, the traditional subject in English.

The privileged syntactic arguments of these two constructions are, however, different in an important respect. In (4.1) the privileged syntactic argument is the trigger of verb agreement, while in (4.6) it is the omitted argument in the linked core of a complex sentence. Privileged syntactic arguments thus come in two types; following Heath (1975), the first subtype of privileged syntactic argument will be referred to as a 'controller' and the latter as a 'pivot'. Controllers may trigger verb agreement, as in (4.1), antecede a reflexive, or supply the interpretation for a missing argument in an adjacent unit, as in (4.6). In the matrix cores in (4.6) the NP Chris is a 'double controller': it controls both verb agreement on the matrix finite verb, and it controls the interpretation of the missing argument in the linked core. Pivots are canonically (but not exclusively) the missing argument in constructions like (4.6); in other words, the missing argument in the linked core in (4.6a–c,e) is the pivot of the construction. Thus, (4.6c) may be schematically represented as in (4.7); the actual structure of control constructions in terms of the layered structure of the clause will be given in chapter 7.

- (4.7) Chris<sub>i</sub> wants      [—<sub>i</sub> to drink a beer]  
CONTROLLER PIVOT

In complex constructions, the two commonly co-occur; this is illustrated in (4.8).

- (4.8) a. Chris<sub>i</sub> slapped Pat<sub>j</sub> and then —<sub>i/\*j</sub> ran away.  
CONTROLLER PIVOT
- a'. Pat<sub>i</sub> was slapped by Chris<sub>j</sub> and then —<sub>i/\*j</sub> ran away.  
CONTROLLER PIVOT

- b. Chris ran up to the table and —slapped Pat.  
CONTROLLER PIVOT
- b'. \*Chris<sub>i</sub> ran up to the table and Pat slapped —<sub>i</sub>.  
CONTROLLER PIVOT
- b''. Chris ran up to the table and — was slapped by Pat.  
CONTROLLER PIVOT

This construction has one privileged syntactic argument in each clause, the controller in the first clause and the pivot (omitted NP) in the second. Each is the traditional subject, as shown by the impossibility of having the undergoer of a transitive verb as the controller in (4.8a) or the pivot in (4.8b') or of having the actor of a passive verb as controller in (4.8a').

Matrix-coding (or ‘raising’) constructions have a structure which is very similar to that of control constructions; there are two types, and they are illustrated in (4.9).

- (4.9) a. It appears that Kim is singing in the shower.  
 a'. Kim<sub>i</sub> appears [<sub>i</sub> to be singing in the shower.  
 PIVOT  
 b. Dana believes that Kim is singing in the shower.  
 b'. Dana believes Kim<sub>i</sub> [<sub>i</sub> to be singing in the shower.  
 PIVOT

*Kim* is semantically an argument of *sing* but occurs as the single argument of *appear* in the matrix core in (a') and as the 'direct object' of *believe* in (b'); it is the matrix-coded argument of the verb in the linked core (cf. section 7.3.2). The structure in (4.9a') appears to be the same as in (4.7), but there is a crucial difference: in (4.7), the NP *Chris* is semantically an argument of *want* and semantically an argument of *drink*, whereas in (4.9a'), the NP *Kim* is not semantically an argument of *appear*, as (4.9a) shows. Hence there is no controller–pivot relationship in (4.9a',b') as in (4.7) and (4.8). The 'raised' NP is, rather, analogous to extracted elements in extraction constructions, e.g. WH-question formation in languages like Sama in which there is a restricted neutralization (see (5.3)), which are considered to be pivots. Hence these raising constructions involve a pivot, and what all pivots have in common is that they involve a 'gap' in the core containing the predicate of which they are a semantic argument.

There are constructions which have just a controller but no pivot. This is exemplified in (4.1) by verb agreement, in which the agreement trigger is a controller, but there is no pivot. Thus the general notion of privileged syntactic argument subsumes pivots and controllers.

In discussing grammatical relations, it is useful to characterize restricted neutralizations in the following way. The neutralization of the actor of an intransitive verb and the undergoer of an intransitive verb, as exemplified in (4.1b,c) and (4.6b,c), yields an 'intransitive subject' function which may be represented as 'S', following Dixon (1972). Acehnese, unlike English, lacks this S function. 'A<sub>T</sub>' stands for the actor of a transitive verb, and 'U<sub>T</sub>' stands for the undergoer of



a transitive verb. Since a passive verb is a derived intransitive verb in most languages, the single core argument of a passive verb will be termed a ‘derived-S’ [d-S]. The restricted neutralization in (4.1) and (4.6) may be represented as ‘[S, A<sub>T</sub>, d-S]’, meaning that the single argument of an intransitive verb (regardless of whether it is actor or undergoer), the actor of a transitive verb, and the single argument of a passive verb function alike in a construction.

Not all languages show this pattern of neutralization. In Kambera, an Austronesian language of eastern Indonesia (Klamer 1994), the undergoer of a transitive verb cannot function as a pivot in constructions like the one in (4.10).

- (4.10) a. Ku-mbuhang pa-ràma. Actor of intransitive V  
1sgNOM-want INF-work  
‘I want to work.’
- b. Nda ku-mbuhang pa-hidu. Undergoer of intransitive V  
NEG 1sgNOM-want INF-be.ill  
‘I don’t want to be ill.’
- c. Ku-mbuhang pa-tinung-nya na lau haromu. Actor of transitive V  
1sgNOM-want INF-weave-3sgDAT ART sarong tomorrow  
‘I want to weave the sarong tomorrow.’

These Kambera control constructions are like the English control constructions in (4.6); there is a missing argument in the linked core. In (4.10a), the omitted argument is the actor of an intransitive verb, while in (b) it is the undergoer of an intransitive verb. Hence Kambera neutralizes the contrast between actor and undergoer with intransitive verbs and, like English, has an S function. With transitive verbs, on the other hand, the situation is rather different. Unlike English, there are no forms like (4.6e) in which the undergoer of a transitive verb functions as a pivot in this construction; Kambera lacks a passive construction. Only the actor of a transitive verb can serve as a pivot in this construction. Hence the neutralization in the Kambera control construction is [S, A<sub>T</sub>], not [S, A<sub>T</sub>, d-S] as in English. Both of these are syntactically accusative patterns.

There is another possible neutralization which is found in a number of languages, an ergative one. It is exemplified by the following sentences from Kalkatungu, an Australian Aboriginal language (Blake 1979). These are participial constructions, in which an argument is missing from the participle, which agrees with the controller in case; the issue, as in (4.6) and (4.10), is, which argument can be omitted (serve as pivot) in the linked unit? The linked unit with the pivot is in brackets in both the Kalkatungu example and its English translation.

- (4.11) a. Tuaṭu pa-ji maṛapai-Ø icaji [iṅka-ḷ-iṅka-cin-Ø]. Actor of intr. V  
snake.ERG that-ERG woman-ABS bite go-LNK-go-PART-ABS  
‘The snake bit the woman<sub>i</sub> [as <sub>i</sub> was walking along].’
- b. [Jaṛikajan-ati-nin-tu] caa ṇa-tu laji Ø. Undergoer of intr. V  
hungry-VBLZ-PART-ERG here 1sg-ERG kill 3sgABS  
‘[<sub>i</sub> Being hungry] I<sub>i</sub> killed it.’

- c. Kuntu caa ɭɳa-ɳa Ø [ɳa-tu ɭa-nin-ka-Ø]. Undergoer of trans. V  
 NEG here cry-PAST 3sgABS 1sg-ERG hit-PART-SUFF-ABS  
 'He<sub>i</sub> didn't cry [when I hit <sub>i</sub>].'
- d. \*Nga-tu ɳaɳa macumpa-Ø [aɾi-nin-Ø kaɾi-Ø]. \*Actor of trans. V [active]  
 1sg-ERG saw kangaroo-ABS eat-PART-ABS grass-ABS  
 'I saw the kangaroo<sub>i</sub> [<sub>i</sub> eating grass].'

In (4.11a) the missing argument in the participle is the actor of an intransitive verb, while in (b) it is the undergoer of an intransitive predicate; these first two sentences show that Kalkatungu neutralizes actor and undergoer with intransitive verbs and hence has an S function. In (4.11c) the omitted argument in the participle is the undergoer of a transitive verb. The actor of an active voice transitive verb cannot be omitted, as the ungrammaticality of (4.11d) shows. This is analogous to (4.6d), and, like English, there is a way to allow the other macrorole argument of a transitive verb to function as the privileged syntactic argument of the construction. English has a voice construction which allows the undergoer of a lexically transitive verb to serve as the privileged syntactic argument, and Kalkatungu has one which allows the actor of a lexically transitive verb to serve as the privileged syntactic argument; it is termed an 'antipassive'. The Kalkatungu antipassive construction is exemplified in (4.12); in the active voice in (4.12a), the actor is in the ergative case and the undergoer in the absolutive, while in the antipassive form in (4.12b) the actor is in the absolutive case, functioning as a d-S, and the other argument appears in the dative case.

- (4.12) a. Nga-tu ɭa-mi tuar-Ø.  
 1sg-ERG hit-FUT snake-ABS  
 'I'm going to hit the snake.'
- b. Ngai ɭa-ji-mi tuar-ku.  
 1sgABS hit-ANTI-FUT snake-DAT  
 'I'm going to hit the snake.'

When the verb in (4.11d) is antipassivized, the actor functions as the single argument of a derived intransitive verb and may be omitted in the construction, as shown in (4.13).

- (4.13) Nga-tu ɳaɳa macumpa-Ø [aɾi-li-nin-Ø kaɾi-ku].  
 1sg-ERG saw kangaroo-ABS eat-ANTI-PART-ABS grass-DAT  
 'I saw the kangaroo<sub>i</sub> [<sub>i</sub> eating grass].' Actor of transitive V [antipassive]

Hence in the Kalkatungu participial construction the neutralization pattern is [S, U<sub>T</sub>, d-S]. Note that there is no restricted neutralization with respect to the controller in these constructions: the controller is the U<sub>T</sub> in (4.11a) and (4.13), the A<sub>T</sub> in (4.11b), and the S in (4.11c).

These neutralization patterns may be summarized as in Table 4.1.<sup>6</sup>

<sup>6</sup> There is one more possible neutralization pattern, [S, U<sub>T</sub>]. It is exceedingly rare; see Van Valin and LaPolla (1997), section 6.5, for an explanation of its limited distribution.

Table 4.1 *Patterns of restricted neutralizations of semantic roles*

	Intransitive V <sub>s</sub>	Transitive V <sub>s</sub>	Grammatical relations	PSA(s)
Acehnese	NO	NO	NO	[A], [U]
English	YES	YES	YES	[S, A <sub>T</sub> , d-S]
Kamera	YES	NO	YES	[S, A <sub>T</sub> ]
Kalkatungu	YES	YES	YES	[S, U <sub>T</sub> , d-S]

It might appear that ‘privileged syntactic argument’ is just another term for syntactic subject, but this is not the case. First, privileged syntactic arguments are construction-specific, while grammatical relations like subject are not. It makes no sense to talk about ‘the privileged syntactic argument in English syntax’ in the same way one might talk about ‘the subject in English syntax’, since subject is assumed to be a general relation playing a role in the grammar as a whole; it would, however, be reasonable to discuss ‘privileged syntactic arguments in English syntax’. Conversely, it is nonsensical to talk about ‘the subject of the raising construction in English’, while ‘the privileged syntactic argument of the raising construction in English’ is perfectly natural. Second, the mistaken equation of syntactic subject with privileged syntactic argument is the result of the fact that in languages like English the privileged syntactic argument of almost all of the major constructions appears to be the same.<sup>7</sup> There are, however, many languages in which this kind of syntactic consistency is lacking in the most striking way, e.g. Jakaltek (Van Valin 1981) or Sama (Walton 1986); in Jakaltek, for example, there are *five* different privileged syntactic arguments for the seven major grammatical constructions surveyed in Van Valin (1981). For these languages the assumption that there is a single notion of subject operative in the grammatical system is extremely problematic. Issues like ‘which argument is the syntactic subject in a language like Jakaltek?’ simply cannot arise in this framework.

While Jakaltek and Sama point up the difficulties with the assumption that syntactic relations in a language can be described in terms of a single set of generally applicable notions, it is nevertheless the case that most languages are more like English than Jakaltek in having the same privileged syntactic argument for most, if not all, of their major syntactic constructions. Subject, then, is a generalized privileged syntactic argument in languages in which most or all of the major constructions have the same restricted neutralization. It is because of this consistency that languages can be characterized as syntactically accusative or ergative. That is, a language is syntactically accusative if the privileged syntactic argument for the majority of constructions in the grammar treats the actor in clauses with transitive verbs the same as the single argument in clauses with intransitive verbs, i.e. [S, A<sub>T</sub>] or [S, A<sub>T</sub>, d-S]; this is the case in English, for

<sup>7</sup> Two constructions which do not have the traditional subject as the privileged syntactic argument are *tough*-movement, e.g. *This book is easy to read*, and purpose clauses, e.g. *Kim brought the book for the teacher to read*.

example. Since transitive verbs have both an actor and an undergoer, this entails the existence of an accessibility hierarchy to privileged syntactic argument, with actor being the unmarked or default choice and undergoer the marked choice. This markedness is signalled in English and many other syntactically accusative languages by means of the passive construction in which the undergoer of a transitive verb is the privileged syntactic argument. In a syntactically ergative language such as Kalkatungu or Sama (Walton 1986), the markedness hierarchy for accessibility to privileged syntactic argument is reversed: undergoer is the unmarked choice and actor the marked choice. In these languages an antipassive construction exists which permits the actor to function as privileged syntactic argument, e.g. the Kalkatungu antipassive in (4.12b). This is summarized in Table 4.2.

Table 4.2 *PSA defaults in accusative and ergative systems*

Syntactic system	Default choice for PSA	Choice for PSA requiring special construction
Accusative	Actor	Undergoer [Passive]
Ergative	Undergoer	Actor [Antipassive]

The markedness of privileged syntactic argument choice is captured in RRG in terms of the privileged syntactic argument selection hierarchy, given in (4.14) and the accessibility to privileged syntactic argument principles in (4.15).

- (4.14) Privileged syntactic argument selection hierarchy:  
arg. of DO > 1st arg. of **do'** > 1st arg. of **pred'** (x, y) > 2nd arg. of **pred'** (x, y) > arg. of **pred'** (x)
- (4.15) Accessibility to privileged syntactic argument principles
- a. Accusative constructions: highest ranking direct core argument in terms of (4.14) (default)
- b. Ergative constructions: lowest ranking direct core argument in terms of (4.14) (default)
- c. Restrictions on PSA in terms of macrorole status:
1. Languages in which only macrorole arguments can be PSA: German, Italian, Dyirbal, Jakaltek, Sama, . . .
2. Languages in which non-macrorole direct core arguments can be PSA: Icelandic, Georgian, Japanese, Korean, Kinyarwanda, . . .
- d. Restrictions on PSA in terms of coding (Bickel 2003a)
1. Languages with case-sensitive PSAs, e.g. English, German, Nepali, Maithili . . .
2. Languages with case-insensitive PSAs, e.g. Belhare, Tibetan, . . .

(The contrasts in (4.15c,d) will be discussed in sections 4.4 and 4.5.) Even though the hierarchy in (4.14) is similar to the actor–undergoer hierarchy, in that it refers to the same argument positions in LSs, it differs in that it is unilateral, taking agent (argument of DO) as the highest ranking and patient (argument of **pred'**

(x)) as the lowest ranking. If a verb takes both an actor and undergoer (i.e. is M-transitive), the actor will be the highest ranking in terms of (4.14), because the highest ranking argument on the actor–undergoer hierarchy, the actor, will also be the highest ranking argument on (4.14). With an M-intransitive verb, on the other hand, the single macrorole is the highest ranking (for the purposes of (4.15a)) or the lowest ranking (for the purposes of (4.15b)). Hence the single macrorole will be privileged syntactic argument, regardless of which macrorole it is. As Table 4.2 shows, the principles in (4.15a) and (4.15b) may express the default selections in languages with voice oppositions. Note that it makes no sense to talk about an accessibility to privileged syntactic argument hierarchy for Acehnese, because the restrictions refer to actor only, undergoer only, or any core argument.

### 4.3 Types of privileged syntactic arguments

The data from Acehnese, English, Kambera and Kalkatungu have illustrated several types of pivots and controllers. In the Acehnese control construction in (4.3), the controller in the matrix core is the actor, and the pivot in the linked core is also the actor, while in the possessor raising construction in (4.4), the raised argument is the undergoer. Since these pivots and controllers are either actors or undergoers, they will be termed ‘semantic pivots and controllers’. They are not syntactic in the sense that they do not involve any kind of neutralization, unlike the other pivots and controllers discussed in section 4.2; they do, however, play an important role in the syntax. Pivots and controllers that involve one of the restricted neutralizations in Table 4.1 are syntactic pivots and controllers. Thus the pivots in the English and Kambera control constructions and in the Kalkatungu participial construction are all syntactic pivots. The controller of verb agreement in English in (4.1) is an example of a syntactic controller, as is the controller in the coordinate constructions in (4.8); both exhibit the [S, A<sub>T</sub>, d-S] pattern typical of English syntax. English does have semantic controllers like Acehnese in some constructions. Consider the control constructions with *persuade* in (4.16).

- (4.16) a. Chris persuaded Pat<sub>i</sub> [—<sub>i</sub> to visit Leslie].  
                        CONTROLLER PIVOT  
       b. Pat<sub>i</sub> was persuaded by Chris [—<sub>i</sub> to visit Leslie].  
                        CONTROLLER PIVOT

In this control construction, the pivot is the same as in (4.6), but the controller is always the undergoer with *persuade*: *Pat* is the undergoer of *persuade* and is the controller in both sentences, regardless of whether it is syntactically the ‘subject’ or ‘direct object’ (see section 7.3.1). Contrast this with the construction in (4.8), in which the controller is the ‘subject’ regardless of whether it is an actor, as in (4.8a), an undergoer, as in (4.8a’), or an intransitive actor as in (4.8b). Hence

(4.16) is an example of a semantic controller in English. This contrast may be summarized as in Figure 4.1.

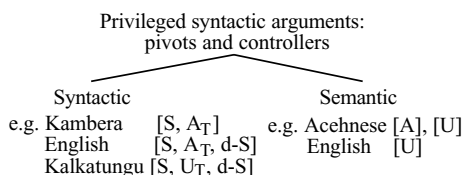


Figure 4.1 *Types of privileged syntactic arguments (preliminary)*

There is an important difference between the privileged syntactic arguments in English and Kalkatungu, on the one hand, and those in Kambera, on the other. In the Kambera construction the speaker has no choice as to which argument will serve as privileged syntactic argument: if the verb is intransitive, then the single argument will function as privileged syntactic argument, and if the verb is transitive, only the actor can be the privileged syntactic argument. Hence the selection of the privileged syntactic argument is invariable. In English and Kalkatungu, on the other hand, either argument of a transitive verb can function as privileged syntactic argument: there is a default choice, actor for English and undergoer for Kalkatungu, but the existence of a voice opposition in these languages makes it possible for an undergoer in English or an actor in Kalkatungu (of a lexically transitive verb) to serve as privileged syntactic argument in certain constructions. Hence the selection of the privileged syntactic argument is not fixed, as in Kambera, but rather is variable. It is necessary, then, to distinguish variable from invariable privileged syntactic arguments, as in Figure 4.2. The existence of the ‘d-S’ possibility differentiates variable from invariable syntactic pivots and controllers.

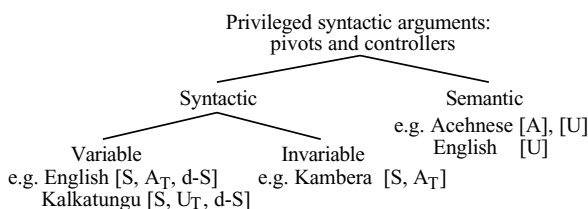


Figure 4.2 *Types of privileged syntactic arguments (revised)*

Given the existence of the variable syntactic controllers and pivots, RRG asks, *what factors influence the selection of the argument to be pivot or controller when there is a choice?* That is, with a transitive verb, there are in principle two candidates for privileged syntactic argument, the actor and the undergoer,<sup>8</sup> and

<sup>8</sup> This is something of an idealization, as in many languages direct core arguments which are not undergoers may function as privileged syntactic argument in a passive construction; see sections 4.4–4.5, Van Valin (1991), L. Roberts (1995) and Van Valin and LaPolla (1997) for a detailed examination of this situation in Icelandic. This idealization does not affect the larger point at hand.

given that a choice must be made as to which one will be privileged syntactic argument, what factors, syntactic, semantic and/or pragmatic, govern or at the very least affect this choice? It is essential to recognize that this issue is only relevant to clauses with transitive verbs; there is no question of choice with an intransitive verb, since the single argument may function as privileged syntactic argument.

In English, as in many languages, one of the factors influencing privileged syntactic argument selection is discourse pragmatics. It was shown in section 3.2 that in predicate focus constructions, the unmarked focus type, the privileged syntactic argument in English is highly topical, and this suggests that pragmatic factors like topicality could influence the choice of which argument will be selected as the privileged syntactic argument in a clause with a transitive verb. Evidence that this is the case comes from chains of clauses which share a common topical participant; Dixon (1972) labelled these constructions ‘topic chains’. Examples from English are given in (4.17).

- (4.17) a. Mary<sub>i</sub> walked into the department store, —<sub>i</sub> looked at a couple of dresses, —<sub>i</sub> bought one, —<sub>i</sub> went up to the coffeeshop, —<sub>i</sub> ordered a cup of coffee and —<sub>i</sub> rested her weary feet.  
 b. Milt<sub>i</sub> strolled into the casino —<sub>i</sub> wearing a fake beard, wig and glasses, but —<sub>i</sub> was immediately recognized by the security people and —<sub>i</sub> was unceremoniously escorted back out to the street.

*Mary* is the primary topical participant in (4.17a) and *Milt* is in (4.17b); they function as privileged syntactic argument in each clause. *Mary* is an actor in each of the clauses in (4.17a), and accordingly active voice is used in all clauses. In (4.17b), on the other hand, *Milt* is an actor only in the first two clauses and the undergoer in the last two; passive constructions are used to allow it to function as privileged syntactic argument. It appears, then, that in topic chains like these, the choice of which argument will function as privileged syntactic argument is affected by discourse pragmatic considerations, in particular by a desire to keep the primary topical participant in the unmarked topic position in the clause. All of these clauses are predicate focus constructions, and this is crucial, for it is difficult to have zero anaphora in a clause following a non-predicate focus construction, as the following examples from Lambrecht (1986, 2000) show.

- (4.18) a. There's John<sub>i</sub> and he<sub>i</sub>'s reading a book.  
 b. \*There's John<sub>i</sub> and —<sub>i</sub> is reading a book.  
 c. John<sub>i</sub> is sitting there and —<sub>i</sub> is reading a book.  
 (4.19) a. John<sub>i</sub> walked into the room and —<sub>i</sub> spoke to Pat immediately.  
 b. \*Into the room walked John<sub>i</sub> and —<sub>i</sub> spoke to Pat immediately.  
 b'. Into the room walked John<sub>i</sub> and he<sub>i</sub> spoke to Pat immediately.  
 (4.20) Q: Who married Rosa?  
 A: a. JOHN<sub>i</sub> did but he<sub>i</sub> didn't really love her.  
 b. ??JOHN<sub>i</sub> did but —<sub>i</sub> didn't really love her.

- (4.21) Q: Did John marry Rosa?  
 A: He<sub>i</sub> did, but he<sub>i</sub>/—<sub>i</sub> didn't really love her.

Example (4.18a) is a presentational construction in which *John* is focal, and it is not possible to have it as the antecedent for zero anaphora, as (4.18b) shows. The locative inversion construction in (4.19b,b') is likewise a kind of presentational construction in which the NP *John* is focal, and here too it cannot be the controller of the pivot in the following clause. In (4.20a), *John* is a narrow focus (the answer to a WH-question) and likewise cannot be an antecedent for zero anaphora, as (4.20b) shows. Contrast these examples with (4.18c) and (4.21), in which *John* is clearly established as topical and not focal and can therefore be the antecedent for zero anaphora. Thus in topic chains involving zero anaphora, the selection of the argument to be privileged syntactic argument is strongly influenced by discourse pragmatic factors: it must be the primary topical participant.

The following text excerpt illustrates the formation of topic chains in Tepehua, a Totonacan language of Mexico (Watters 1986).

- (4.22) 'čun, wa k-tʔahun makč̃a:-n,' wa nahun ni haciʔi,  
 yes, FOC 1SUBJ-be.IMPF cook-INF FOC say.IMPF the girl  
 'Ka-tawl-čiy-č̃a,' wa jun-kan ni šanati<sub>1</sub>, mu:la:-ni-ka-ł —<sub>1</sub>  
 IRR-sit.down-here-already FOC tell-PASS the woman set-DAT-PASS-PRFV  
 ni ʔiš-ta:nci, ʔeš wa tawla-ł-č̃a —<sub>1</sub> Yu haciʔi<sub>2</sub> tʔahun makč̃a:-n la:  
 the 3sg-chair then FOC sit-PRFV-already the girl be.IMPF make-INF very  
 kʔusi cʔa:lukʔu, maka:-y —<sub>2</sub> šoqta yu la:ʔan laka: kušta  
 nice tortilla make-IMPV everything the take-IMPV to cornfield  
 mu:la:-ta-č̃a —<sub>2</sub> mu:la:-ta —<sub>2</sub> mole, tʔahni. ʔeš tawał ʔaqtay-ł-č̃a —<sub>2</sub>  
 put.in-PERF-already put.in-PERF mole, turkey and then begin-PRFV-already  
 lakla-ni-kan, hun-kan-č̃a —<sub>2</sub> čiwinti yu ha:ntu laqsawał.  
 gossip-DAT-PASS, tell-PASS-already words that not true  
 'Yes, I'm cooking,' says the girl. 'Sit down,' the woman is told, was set a  
 chair and then sat down. The girl was cooking real nice tortillas, [she] makes  
 everything that [she] takes to the cornfield, put in [a basket]; [she] put in mole  
 and turkey, and then [she] began to be gossiped to, is told words that are not  
 true.'

The first sequence of linked clauses has *ni šanati* 'the woman' as its primary topical participant. It is the privileged syntactic argument of two passive clauses, *junkan* 'be told' and *mu:lamikan* 'be set [something]', and an intransitive verb, *tawla-* 'sit'. The verb morphology indicates that the participant is the undergoer of 'tell' and 'set', and the actor of 'sit'. In the remainder of the passage, *ni haciʔi* 'the girl' is the primary topical participant and is the privileged syntactic argument of all of the remaining clauses. It is the actor in all but the last two clauses, as signalled by the active voice of the verbs, and then in the last two clauses the verbs are passive, indicating a change in semantic function from actor to undergoer.

In both English and Tepehua, then, one of the major factors motivating the selection of the argument to function as privileged syntactic argument is discourse pragmatics, in particular whether the argument in question is the primary



topical participant in the context.<sup>9</sup> This situation is found in many languages, e.g. Sama (Walton 1986), Tagalog (Foley and Van Valin 1984), Malagasy (Keenan 1976), Dyirbal (Dixon 1972; Van Valin 1981), Jakalteq (Datz 1980), Tzutujil (Butler and Peck 1980), Lango (Noonan and Bavin-Woock 1978). It must be emphasized that pragmatics plays a role in assigning an argument to be the privileged syntactic argument of the relevant construction only with transitive verbs; with intransitive verbs there is no choice, and therefore pragmatics has no role to play. That is, discourse-pragmatics can affect privileged syntactic argument selection only in constructions with variable pivots and controllers. Thus, it is necessary to distinguish pragmatically influenced variable privileged syntactic arguments from those that are not pragmatically influenced; an example of the latter would be the variable syntactic pivot in (4.6), where the selection of the argument in the linked core is driven by the requirement that the pivot be identical to the controller argument in the matrix core, regardless of the context. The final version of the typology of privileged syntactic arguments is given in Figure 4.3.

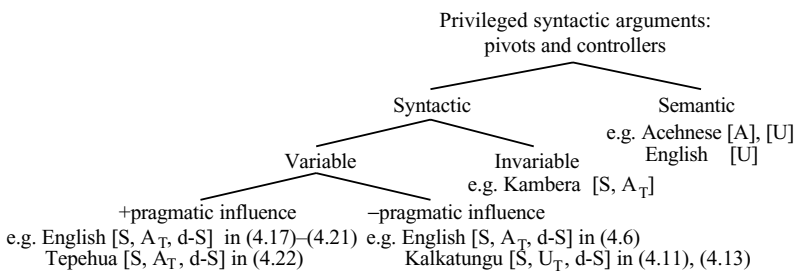


Figure 4.3 *Types of privileged syntactic arguments (final)*

It should be noted that pragmatically influenced variable privileged syntactic arguments include both controllers and pivots. That is, in topic chains, for example, both the controllers and pivots are pragmatically influenced; indeed, the pivot of the second clause is the controller of the pivot in the subsequent clause, and so on, and it was argued that the motivation for the choice of privileged syntactic argument in each clause is to keep the primary topical participant as privileged syntactic argument in each clause. Hence the topic chains in English in (4.17) and in Tepehua in (4.22) illustrate both pragmatically influenced variable controllers and pivots.

It was noted earlier that the traditional notion of ‘subject’ is a generalization across the pivots and controllers of the major syntactic constructions in a language. Given the distinctions in Figure 4.3, it is possible to sharpen this idea a bit: namely, only syntactic pivots and controllers contribute to the generalized privileged syntactic argument notion that is the traditional ‘subject’ in a language. Semantic controllers and pivots do not. This can be seen clearly in the contrast

<sup>9</sup> See Branigan and Prat-Sala (2000) and Heydel and Murray (2000) for cross-linguistic psycholinguistic evidence of a discourse motivation for passives in certain contexts.

between (4.8) and (4.16a); the syntactic controller in the former is the traditional 'subject', while the controller in (4.16a) is not.

The situation regarding privileged syntactic argument selection in languages with variable privileged syntactic arguments is not, however, the norm universally. In many languages, there is no choice with respect to which argument will be privileged syntactic argument with a transitive verb: it is always the actor. Discourse-pragmatic considerations have no influence on privileged syntactic argument choice. Van Valin and LaPolla (1997), section 6.5, argued that this grammatical relations pattern is in fact the most common pattern cross-linguistically. It is illustrated in (4.23), a switch-reference construction from Amele, a Papuan language (J. Roberts 1988).

- (4.23)      *Ho busale-ce-b      dana age qo-ig-a.*  
               pig run.out-DS-3sg man 3pl hit-3pl-TPAST  
               'The pig ran out and the men killed it.'

In order to form the Amele equivalent of the topic chains in English and Tepehua, the switch-reference construction must be employed to string together clauses joined by switch-reference morphology on the non-final verbs. In this construction markers on dependent medial verbs signal identity or non-identity of particular arguments in the adjacent linked clauses, and these arguments are the privileged syntactic arguments in the construction. Switch-reference systems almost always have a privileged syntactic argument composed of the actor of transitive verbs and the single argument of intransitives, i.e. [S, A<sub>T</sub>].<sup>10</sup> Assume, for the sake of the discussion, that the pig is the primary topical participant in the discourse. In the first clause in (4.23), *ho* 'the pig' is the actor of an intransitive verb, and in the second it is the undergoer of a transitive verb. In sharp contrast to English and Tepehua, in Amele there is no way for *ho* 'the pig' to function as privileged syntactic argument of the final clause in (4.23); only *dana age* 'the men', the actor of *qo-* 'hit, kill', can be privileged syntactic argument. There is no Amele construction analogous to the English topic chain *the pig ran out and was killed by the men*, in which an undergoer serves as privileged syntactic argument. Thus discourse considerations do not affect the choice of which argument will be privileged syntactic argument with a transitive verb in Amele; only the actor can be the privileged syntactic argument with a transitive verb.

Even though the actor will always be the privileged syntactic argument with a transitive verb, there is nevertheless a restricted neutralization of semantic roles for syntactic purposes here, because the construction does not distinguish between actor and undergoer with *intransitive* verbs. This is what crucially differentiates languages like Amele from languages like Acehnese in which there is no restricted neutralization with intransitive verbs. Other languages which have a system in which discourse-pragmatic factors have no effect on

<sup>10</sup> Barai, another Papuan language, and Eastern Pomo, a Hokan language of California, are exceptions to this generalization (for different reasons). See Olson (1978, 1981) and McLendon (1978) for detailed discussion.

the selection of the argument to be privileged syntactic argument with a transitive verb include Lakhota (Siouan), Choctaw (Muskogean), Cree (Algonquian, North America), Zapotec (Oto-Manguean, Mexico), Enga, Kewa, Yimas, Fore (Papua-New Guinea), Mparntwe Arrernte, Warlpiri (Australia), Chechen, Ingush (Caucasus, Russia), Thai and Vietnamese.

It must be emphasized that, within a single language, different constructions may have different privileged syntactic argument selection criteria. That is, in some constructions pragmatic considerations play a role in privileged syntactic argument selection, e.g. determining the pivot argument in the non-initial clauses in topic chains as in (4.17) and (4.22) (where both the controller and the omitted arguments are clause-internal), while in others, e.g. the control construction in (4.6), they are irrelevant and other considerations determine the argument to be privileged syntactic argument. English, for example, has both semantic controllers, as in (4.16) and variable syntactic controllers, as in (4.8) and (4.17).

Thus there are two very different situations regarding selection of the argument to function as privileged syntactic argument in syntactic constructions in the world's languages. In some constructions in some languages, discourse-pragmatic considerations influence this selection, while in the majority of languages there are no constructions in which they play a role. In markedness terms, it could be described as [ $\pm$ pragmatic influence], with [ $+$ pragmatic influence] the marked case and [ $-$ pragmatic influence] the unmarked case. Since focus (information) structure is a feature of the grammar of all languages, what this contrast represents is the variable grammaticalization of discourse-pragmatic relations in clause-internal morphosyntax, in particular in clause-internal relational structure. As mentioned earlier, whether a privileged syntactic argument is [ $\pm$ pragmatic influence] can only be determined by looking at clauses with transitive verbs, since there is no choice with respect to which argument will be the privileged syntactic argument with an intransitive verb. It is crucial to realize that the issue with respect to whether a privileged syntactic argument is [ $\pm$ pragmatic influence] is not whether *the NP functioning as privileged syntactic argument* is pragmatically salient or not. Rather, the issue is whether these pragmatic considerations are a factor in the clause-internal syntactic process of selecting the argument to function as privileged syntactic argument, and here Tepehua and Amele differ dramatically: in Tepehua they may affect the selection of the privileged syntactic argument, while in Amele they cannot.

#### 4.4 Case marking and agreement

In syntactic theories in which grammatical relations play a role, case marking and agreement are invariably tied to them, either directly or indirectly. Since notions like subject and direct object have no place in RRG, it is obvious that neither case marking nor agreement can be based on them. Rather, case

marking rules make crucial reference to macroroles and direct core argument status. The inherent lexical content of NPs (Silverstein 1976, 1981, 1993), which is sometimes misleadingly termed ‘animacy’, also plays an important role in the formulation of case marking rules in many languages. Agreement rules make primary reference to macroroles, although here again inherent lexical content may play a role, e.g. in some languages verbs only agree with animate arguments (Lakhota is such a language).

The finite verb agreement rule for Russian, English, Icelandic and German is given in (4.24).

- (4.24) Finite verb agreement in Russian, German and Icelandic:  
the controller of finite verb agreement is the highest ranking macrorole argument (in terms of (4.14)).

This correctly picks out the agreement controller in the English sentences in (4.1), as well as (4.18a) and (4.19b’).

The casemarking rules cover regular (non-idiosyncratic<sup>11</sup>) case marking and are given in (4.25) and (4.26); they apply to direct core arguments only.

- (4.25) Case assignment rules for accusative constructions:  
a. Assign nominative case to the highest ranking macrorole argument (in terms of (4.14)).  
b. Assign accusative case to the other macrorole argument.
- (4.26) Case assignment rules for ergative constructions:  
a. Assign absolutive case to the lowest ranking macrorole argument (in terms of (4.14)).  
b. Assign ergative case to the other macrorole argument.

The application of the rules in (4.25) can be seen in the following Russian examples.

- (4.27) a. Učitel’nic-a pro-čita-l-a knig-u.  
teacher-FsgNOM PRFV-read-PAST-Fsg book-FsgACC  
‘The teacher read the book.’
- a’. **do’** (učitel’nic-, [**read’** (učitel’nic-, knig-)]) & INGR **consumed’** (knig-)<sup>12</sup>
- b. Učitel’nic-a govori-l-a.  
teacher-FsgNOM speak-PAST-Fsg  
‘The teacher was speaking.’

<sup>11</sup> For RRG analyses of idiosyncratic or ‘quirky’ case in Icelandic, Latin, Croatian and Hindi, see Van Valin (1991), Michaelis (1993), Dahm-Draksic (1997) and Narasimhan (1998).

<sup>12</sup> In logical structures of sentences from languages with morphological case on nouns, the stem of the head noun is represented in the logical structure argument position. Pronouns are represented differently depending on their morphological properties. In languages like Warlpiri, for example, pronouns seem to have an invariable stem and take the same case suffixes as nouns; hence they will be represented by the stem in logical structure, as in (4.28a’). In languages like English and Icelandic, on the other hand, in which pronouns are irregular morphologically, they will be represented in terms of their relevant features, e.g. person, number and gender.

- b'. [do' (učitel'nic-, [speak' (učitel'nic-)])]
- c. Ženščin-a umer-l-a.  
woman-FsgNOM die-PAST-Fsg  
'The woman died.'
- c'. BECOME **dead'** (ženščin-)

The first example contains the M-transitive verb *pročítat* 'read [completely]'; the actor *učitel'nic-* 'teacher' is the highest ranking macrorole and therefore receives nominative case, while the undergoer *knig-* 'book' is the other macrorole and therefore receives accusative case. The last two examples contain M-intransitive verbs, one of which takes an actor (*govorit'* 'speak' in (4.27b)) and the other an undergoer (*umeret'* 'die' in (c)). Since the single macrorole, regardless of type, is the highest ranking by virtue of being the only one, it receives nominative case.

The application of the ergative case assignment rules in (4.26) is illustrated in the Warlpiri examples in (4.28) from Hale (1973); these rules are the basic ones for an ergative system, and they do not deal with the complexities that arise in split-ergative systems (see Van Valin and LaPolla 1997, section 7.3.1.2).

- (4.28) a. Ngaju-Ø ka-rna purla-mi.  
1sg-ABS PRES-1sg shout-NONPAST  
'I am shouting.'
- a'. [do' (ngaju-, [shout' (ngaju-)])]
- b. Ngaju-Ø ka-rna mari-jarri-mi.  
1sg-ABS PRES-1sg grief-being-NONPAST  
'I feel sorry', 'I grieve.'
- b'. **feel'** (ngaju-, [grief'])
- c. Ngaju-rlu ka-rna-Ø wawiri-Ø pura-mi.  
1sg-ERG PRES-1sg-3sg kangaroo-ABS cook-NONPAST  
'I am cooking the kangaroo.'
- c'. [do' (ngaju-,)] CAUSE [BECOME **cooked'** (wawiri-)]

The first two examples contain M-intransitive verbs, *purla-* 'shout' (activity) and *mari-jarri* 'feel sorry, grieve' (state); the first takes an actor argument, the second an undergoer. Each is the lowest ranking macrorole in the core and therefore receives absolutive case, following (4.26a). In (c) with an M-transitive verb *pura-* 'cook', *wawiri-* 'kangaroo' is the undergoer and the lowest ranking macrorole, while *ngaju-* 'I' is the actor and the other macrorole. Hence *wawiri-* appears in the absolutive case and *ngaju-* in the ergative case.

The rules for assigning dative and instrumental case are the same for both ergative and accusative systems. They are given in (4.29).

- (4.29) a. Assign instrumental case to non-MR *b* argument if, given two arguments, *a* and *b*, in a logical structure, with (1) both as possible candidates for a particular macrorole and (2) *a* is equal or higher (to the left of *b*) on the AUH, *b* is not selected as that macrorole.
- b. Assign dative case to non-macrorole arguments (default).

The idea that dative is the default case for non-macrorole core arguments comes from Silverstein (1981). Instrumental is not a default case and has specific conditions on its application. The assignment of instrumental case in Croatian and Dyirbal is illustrated below. (The Croatian example is from Ranko Matasović, personal communication; the Dyirbal example is from Dixon (1972).)

- (4.30) a. Žena-Ø je otključa-l-a vrata ključ-em. Croatian  
 woman-FsgNOM be.3sg unlock-PAST-FEM door.NplACC key-MsgINST  
 'The woman unlocked the door with the key.'
- b. [do' (žena-, Ø)] CAUSE [[do' (ključ-, Ø)] CAUSE [BECOME NOT **locked'** (vrat-)]]
- (4.31) a. Bala yugu-Ø baṅgul yaṛa-ṅgu baṅgu bari-ṅgu nudi-n. Dyirbal  
 NM.ABS tree-ABS NM.ERG man-ERG NM.INST axe-INST cut-TNS  
 'The man cut the tree with an axe.'
- b. [do' (yaṛa-, Ø)] CAUSE [[do' (bari-, Ø)] CAUSE [BECOME **cut'** (yugu-)]]

In both of these logical structures, there are two effector arguments, *žena*- 'woman' and *ključ*- 'key' in (4.30b) and *yaṛa*- 'man' and *bari*- 'axe' in (4.31b); both are potential actors. The first effector in each logical structure is chosen as actor, leaving the second effector as a non-macrorole argument. This satisfies the conditions specified in (4.29a), and therefore instrumental case is assigned to the non-actor effectors in both sentences.

The application of the dative rule can be exemplified with sentences from Russian and Warlpiri.

- (4.32) a. Učitel'nic-a da-l-a knig-u ženščin-e.  
 teacher-FsgNOM give-PAST-Fsg book-FsgACC woman-FsgDAT  
 'The teacher gave a book to the woman.'
- b. [do' (učitel'nic-, Ø)] CAUSE [BECOME **have'** (ženščin-, knig-)]

The linking of actor and undergoer is the same as in (4.27a): *učitel'nic*- 'teacher' is the highest ranking argument and therefore the actor, while *knig*- 'book' is the lowest ranking argument and therefore the undergoer. They receive the same cases as in (4.27a). The third core argument, *ženščin*- 'woman', is a non-macrorole core argument and because the conditions for instrumental case do not apply, it receives dative case.

- (4.33) a. Ngaju-rlu ka-rna-ngku karli-Ø yi-nyi nyuntu-ku.  
 1sg-ERG PRES-1sg-2sg boomerang-ABS give-NONPAST 2sg-DAT  
 'I am giving you the boomerang.'
- b. [do' (ngaju-, Ø)] CAUSE [BECOME **have'** (nyuntu-, karli-)]

In the Warlpiri example, the ditransitive verb *yi-* ‘give’ heads the core; *ngaju-* is the actor and *karli-* ‘boomerang’ is the undergoer, following the actor–undergoer hierarchy, and *nyuntu-* ‘you’ is left as a non-macrorole core argument. Accordingly, *ngaju-* receives ergative case, *karli-* absolutive case, and *nyuntu-* dative case.

The dative and instrumental rules interact in an interesting way with verbs which permit variable undergoer choice, and such verbs are found in both Croatian and Dyirbal. Examples illustrating this alternation are given in (4.34) from Croatian (Zovko 2000, 2001) and in (4.35) from Dyirbal (Dixon 1972).

- (4.34) *darovati* ‘give as a gift’ [**do’** (unuk-, Ø)] CAUSE [BECOME **have’** (bak-, cvijet-)]
- a. Unuc-i su bak-i darova-l-i cvijeć-e.  
grandson-MplNOM be.3pl grandmother-FsgDAT give-PAST-pl flower-MplACC  
‘The grandsons gave flowers to [their] grandmother.’
- b. Unuc-i su bak-u darova-l-i cvijeć-em.  
grandson-MplNOM be.3pl grandmother-FsgACC give-PAST-pl flower-MplINST  
‘The grandsons gave [their] grandmother flowers.’
- (4.35) *wugal* ‘give’: [**do’** (ɖugumbil-, Ø)] CAUSE [BECOME **have’** (yaɾa-, miraŋ-)]
- a. Balam miraŋ-Ø baŋgun ɖugumbi-ru wuga-n bagul yaɾa-gu.  
NM.ABS beans-ABS NM.ERG woman-ERG give-TNS NM.DAT man-DAT  
‘The woman gave beans to the man.’
- b. Bayi yaɾa-Ø wuga-n baŋgun ɖugumbi-ru baŋgum miraŋ-ɖu.  
NM.ABS man-ABS give-TNS NM.ERG woman-ERG NM.INST beans-INST  
‘The woman gave the man beans.’

The Croatian verb *darovati* ‘give as a gift’ allows either the recipient or the theme to function as undergoer. In the default linking, illustrated in (4.34a), *cvijet-* ‘flowers’, the lowest ranking argument, is selected as undergoer, and *bak-* ‘grandmother’, the non-macrorole core argument, receives dative case. In the other linking, shown in (4.34b), the recipient *bak-* ‘grandmother’ is chosen as undergoer, leaving *cvijet-* ‘flowers’ as a non-macrorole argument. This linking meets the conditions of the instrumental case rule: both *cvijet-* ‘flowers’ and *bak-* ‘grandmother’ are potential undergoers, and *bak-* ‘grandmother’ is to the left of *cvijet-* ‘flowers’ in the logical structure. Consequently, *cvijet-* ‘flowers’ is assigned instrumental case. The same contrast is found in the Dyirbal examples in (4.35). In the first sentence, the lowest ranking argument, *miraŋ-* ‘beans’, is selected as undergoer, leaving *yaɾa-* ‘man’ as a non-macrorole argument; it receives dative case. In (4.35b), however, the recipient *yaɾa-* ‘man’ is chosen as the undergoer, leaving *miraŋ-* ‘beans’ a non-macrorole argument. Here too the instrumental rule can apply, because *yaɾa-* ‘man’ is higher on the actor–undergoer hierarchy than *miraŋ-* ‘beans’; accordingly, *miraŋ-* ‘beans’ receives instrumental case. In these pairs of sentences, dative case on the non-macrorole argument correlates with the unmarked choice for undergoer in terms of the actor–undergoer hierarchy, while instrumental case on it correlates with a marked choice

for undergoer, i.e. the undergoer is not the lowest ranking argument in the logical structure.

The main point for this discussion is that the rules in (4.25) and (4.26) make no reference to grammatical relations of any kind at all; indeed, they do not even refer directly to the notion of privileged syntactic argument. This is quite important, because in Icelandic, as in many languages, the principles determining the privileged syntactic argument are independent of the case assignment principles. This can be seen most clearly in examples like the following.

- (4.36) a. Mér hef-ur þótt Ólaf-ur leiðinleg-ur.  
 1sgDAT have-3sg think.PSTP Olaf-MsgNOM boring-MsgNOM  
 'I considered Olaf boring.'
- b. Mér virðist hafa þótt Ólaf-ur leiðinleg-ur.  
 1sgDAT seem have.INF think.PSTP Olaf-MsgNOM boring-MsgNOM  
 'I seem to have considered Olaf boring.'
- b'. \*Ólaf-ur virðist þeim hafa þótt leiðinleg-ur.  
 Olaf-MsgNOM seem 3plDAT have.INF think.PSTP boring-MsgNOM  
 \*'Olaf seems to have been considered boring by them.'

The logical structure for (4.36) is **consider'** (1sg, [**be'** (Olaf, [**boring'**])) [MR 1]; because this verb is M-intransitive, the single macrorole is undergoer, following the principles in (2.41b), and the other argument is a non-macrorole core argument. Hence *Ólaf-* is the undergoer, and the first singular pronoun is a non-macrorole core argument. With respect to the privileged syntactic argument selection hierarchy in (4.14), '1sg' is the highest ranking argument and therefore would be the privileged syntactic argument, and this is confirmed by the grammaticality of (4.36b) and the ungrammaticality of (4.36b'). The case assignment rules, on the other hand, refer to highest ranking macrorole, and in this sentence that is *Ólaf-*, the undergoer, which appears in the nominative case. In sentences like (4.36), the privileged syntactic argument selection hierarchy and the nominative case rule pick out different NPs. In a language like German in which only macroroles can serve as privileged syntactic argument, the nominative NP will always be the privileged syntactic argument, unless it is a dummy *es* 'it', as in, e.g., *Es regnet* 'it is raining'.

In (4.15d) a restriction in terms of the case-sensitivity of privileged syntactic arguments was introduced; this contrast was proposed in Bickel (2003a). It concerns whether privileged syntactic argumenthood is restricted in terms of the morphological coding of the highest ranking argument in the core. Consider the following contrast in agreement between Nepali, an Indo-European language, and Belhare, a Tibeto-Burman language.

- (4.37) a. Ma bhut saṅga ḍarā-ē. Nepali  
 1sgNOM ghost with fear-1sgPAST  
 'I was afraid of the ghost.'



- b. Ma-lāi bhut saṅga ḍar lāg-yo/\*lāg-ē.  
 1sg-DAT ghost with fear feel-3MsgPAST/feel-1sgPAST  
 'I was afraid of the ghost.'
- (4.38) a. Han-na tombhira kii?-t-u-ga i? Belhare  
 2sg-ERG lynx.NOMsg fear-NPAST-3sgO-2sgA Q  
 'Are you afraid of the lynx?'
- b. Ngka hale hani-niūa ka-tiu-s-ik-kha.  
 1sgNOM before 2plGEN-mind.NOM 1sgO-spend-TR-2plA-PERF  
 'Before, you liked me.'

In all four of these sentences, the experiencer is the highest ranking argument, in terms of the privileged syntactic argument selection hierarchy in (4.14), and therefore it should be the privileged syntactic argument in each sentence. This is the case in (4.37a), in which the experiencer appears in the nominative case and triggers first-person-singular agreement on the verb. In (4.37b), on the other hand, the experiencer does not trigger agreement; it appears in the dative case, and the verb bears impersonal inflection. The only difference between the two sentences is the case assigned to the experiencer: nominative in (4.37a) but dative in (b). The dative case in (b) blocks the experiencer from being a controller of verb agreement, hence from being a privileged syntactic argument. The situation in Belhare is strikingly different: the experiencer triggers transitive subject agreement on the verb regardless of its morphosyntactic coding. In (4.38a) it is a direct core argument in the ergative case, while in (b) it is coded as the possessor of a body part term, in this case the noun meaning 'mind'. Nevertheless, it still triggers second-person-plural transitive subject agreement on the verb, showing that it functions as a privileged syntactic argument. Thus, it is necessary to have case sensitivity as a factor in privileged syntactic argument selection.<sup>13</sup>

In English, case marking rules like those in (4.25) apply only to pronouns, and the equivalent for lexical NPs is prepositional case marking. As noted in section 2.4.2, the adpositions that mark oblique core arguments are not listed in the lexical entry of the verb but rather are predicted by general principles. This approach to preposition assignment was first presented in Foley and Van Valin (1984) and further developed in Jolly (1991, 1993) and Van Valin and LaPolla (1997). The basic rules governing the assignment of *to*, *from* and *with* are given in (4.39).<sup>14</sup>

- (4.39) Preposition assignment rules for English
- a. Assign *to* to non-MR y argument in logical structure segment: . . .  
 BECOME/INGR **pred'** (y, z)
  - b. Assign *from* to non-MR y argument in logical structure segment: . . .  
 BECOME/INGR NOT **pred'** (y, z)

<sup>13</sup> See Bickel (2003a) for the wider syntactic ramifications of this distinction.

<sup>14</sup> These rules do not cover all uses of *from* or *with*. See Jolly (1991, 1993) for discussion of other uses of *from*. Van Valin and LaPolla (1997), section 7.3.2.1, discusses a wide range of uses of *with*.

- c. Assign *with* to non-MR *b* argument if, given two arguments, *a* and *b*, in a logical structure, with (1) both as possible candidates for a particular macrorole and (2) *a* is equal or higher (to the left of *b*) on the AUH, *b* is not selected as that macrorole.

The rule for assigning *with* is basically the same as the rule for assigning instrumental case in (4.29a). The application of these rules for *to* and *with* can be illustrated with the sentences in (4.40). They are all concerned with the undergoer end of the actor–undergoer hierarchy and the selection of the undergoer macrorole. The alternation with *present* in (4.40b,b') is known as the 'transfer alternation', while the one in (4.40c,c') with *load* is known as the 'locative alternation'.

- (4.40) a. Sally gave the flowers [z] to Kim [y].  
 a'. Sally gave Kim [y] the flowers [z].  
 b. Sally presented the flowers [z] to Kim [y].  
 b'. Sally presented Kim [y] with the flowers [z].  
 b''. [do' (Sally, Ø)] CAUSE [BECOME **have'** (Kim, flowers)]  
 c. Max loaded the olives [z] into his minivan [y].  
 c'. Max loaded his minivan [y] with the olives [z].  
 c''. [do' (Max, Ø)] CAUSE [BECOME **be-in'** (minivan, olives)]

In the LS in (4.40b''), *Kim* corresponds to the *y* argument and *flowers* to the *z* argument in (4.39a). In (4.40a,b) *the flowers* is selected as undergoer, leaving *Kim* as a non-macrorole argument, and by (4.39a) it would be assigned *to*. The sentence with *load* in (4.40c) also meets the conditions for the assignment of *to* to the *y* argument, but because the predicate in the LS is a prepositional predicate, **be-in'**, *to* is in effect added to the prepositional predicate to yield *into*.<sup>15</sup> In the (a'), (b') and (c') sentences in (4.40), however, the higher ranking argument on the actor–undergoer hierarchy, the *y* argument, is selected as undergoer instead of the lowest ranking argument, *z*. In this situation the *with* rule in (4.39c) should apply, assigning *with* to the *z* argument (= *b* in (4.39c)), because it has not been selected as a macrorole. The primary difference between dative shift verbs like *give* and transfer verbs like *present* in English is that the *with* rule does not apply to the *z* argument of dative shift verbs. Transfer verbs in English are analogous to the Croatian and Dyirbal verbs discussed above, in that they assign *with* (the English analogue of instrumental case) to the lowest ranking argument when it is not selected as undergoer.

This same rule applies at the other end of the actor–undergoer hierarchy, as illustrated in (2.38), repeated as (4.41).

<sup>15</sup> The examples in (4.40c,c') exhibit the much discussed variation in the affectedness of the olives and the minivan, i.e., in (c) all of the olives are loaded into the minivan, with no implication that the minivan is fully loaded, whereas in (c') the minivan is fully loaded, with no implication that all of the olives have been loaded. This difference in interpretation is attributed to the different undergoer selections, the undergoer being the most affected participant in the state of affairs. See Van Valin and LaPolla (1997:145).

- (4.41) a. Leslie shattered the window with a rock.  
 b. [**do'** (Leslie, Ø)] CAUSE [[**do'** (rock, Ø)] CAUSE [INGR **shattered'** (window)]]

In this logical structure *Leslie* and *rock* are both effectors and therefore potential actors; indeed, if *Leslie* were omitted, *a rock* would be the actor, as in *A rock shattered the window*. However, in (4.41) *Leslie* is the effector of the superordinate CAUSE and therefore outranks *a rock* to be actor. In terms of (4.39c), *Leslie* is *a* and *a rock* is *b*, and since *a rock* is not selected as actor, it is marked by *with*. This is exactly analogous to the assignment of instrumental case in the Croatian and Dyirbal examples in (4.30) and (4.31). Thus the same basic principle governs the assignment of *with* in both (4.40) and (4.41).

The application of the *from* rule in (4.39b) can be seen in the examples in (4.42).

- (4.42) a. The pool cleaner drained the water [z] from the pool [y].  
 b. The pool cleaner drained the pool [y] of its water [z].  
 c. [**do'** (pool cleaner, Ø)] CAUSE [BECOME NOT **be-in'** (pool, water)]

In (4.42a) the *z* argument, *the water*, is selected as undergoer, and the conditions for the *from* rule in (4.39b) are met, resulting in the *y* argument, *the pool*, being marked by *from*. In (4.42b), on the other hand, the higher ranking *y* argument is selected as undergoer, resulting in a marked undergoer selection and the application of the *with* rule in (4.39c). However, with removal verbs like *drain*, *with* is replaced by *of*.

## 4.5 Other syntactic functions

It was stated in section 4.0 that RRG does not posit any clause-internal syntactic relations beyond privileged syntactic argument, and therefore there are no relations akin to the traditional notions of direct or indirect object in RRG. 'Direct object' is by far the more important of the two relations, and the motivation for postulating such a relation in other theories has come primarily from two sets of phenomena: (1) voice constructions in which an underlying direct object appears as surface subject, and (2) constructions in which new direct objects are added to a clause ('applicative constructions'). In this section it will be shown that the notions of undergoer and core argument account for these phenomena, thereby rendering 'direct object' superfluous.

In syntactic theories employing multiple derivationally related syntactic levels of representation, the notion of direct object plays a crucial role in the statement of voice oppositions. In RRG, by contrast, passive is formulated in terms of the hierarchy of privileged syntactic argument selection in (4.15a): passive always involves a marked privileged syntactic argument choice, with the undergoer appearing as privileged syntactic argument in the default situation;

cf. Table 4.2. No notion of syntactic direct object is involved. There are usually (but not always) two facets of a passive construction, the occurrence of a marked privileged syntactic argument choice, and the omission of the actor or its appearance as an oblique element in the periphery. The former is referred to as 'PSA modulation', the latter as 'argument modulation', in Van Valin and LaPolla (1997). Antipassive constructions canonically involve these same two phenomena: a marked privileged syntactic argument selection and the omission or non-canonical coding of the undergoer. The universal formulation of the basic voice oppositions is presented in (4.43).

- (4.43) General characterization of basic voice constructions
- a. PSA modulation voice: permits an argument other than the default argument in terms of (4.14) to function as the privileged syntactic argument.
  - b. Argument modulation voice: gives non-canonical realization to a macrorole argument.

An important motivation for factoring voice constructions into these two parts is that they occur independently of each other in some languages. Impersonal passives with intransitive verbs of the kind found in German, Latin, Turkish and many other languages involve only (4.43b), since the resulting constructions have no privileged syntactic argument. There are also languages in which this kind of impersonal passivization applies with transitive verbs, suppressing the actor but leaving the undergoer as a non-privileged syntactic argument in the accusative case, e.g. Ute (Uto-Aztecan; Givón 1981). Here again passive involves only (4.43b) and not (4.43a). These two possibilities are illustrated in (4.44).

- (4.44) a. Hier wird nicht gelacht. German  
 here become.3sgPRES not laughed  
 'No laughing here.' (lit. 'here is not laughed.')
- b. Siváŋtu-ci 'u-wáy paŋá-ta-ŋa. Ute  
 goat-ACC the-ACC kill-PASS-TNS  
 'The goat was killed', or 'Someone killed the goat.'

On the other hand, in Lango (Nilo-Saharan; Noonan and Bavin-Woock 1978; Noonan 1992) the undergoer may occur as privileged syntactic argument with the actor remaining a direct core argument; this Lango construction involves privileged syntactic argument modulation only, and there is no special morphology on the verb signalling the construction, unlike in the impersonal passives mentioned above. L. Roberts (1995) argues that passive morphology on the verb is associated with argument modulation only, and the contrast between, e.g., Ute and Lango supports her claim. A similar situation is found in many antipassive constructions, in which the actor functions as the privileged syntactic argument of the construction, but the undergoer remains a direct core argument, e.g. Jakaltek (Craig 1977), Sama (Walton 1986). The Lango and Sama constructions are exemplified in (4.45) and (4.46).

- (4.45) a. Dákó ò-jwát-ò lócà. Lango  
 woman 3sgA-hit-3sgU man  
 'The woman hit the man.'
- b. Lócà dákó ò-jwát-ò.  
 man woman 3sgA-hit-3sgU  
 'The man was hit by the woman.'
- (4.46) a. B'ili d'nda daing. Sama  
 buy woman fish  
 'The woman bought the fish.'
- b. N-b'ili d'nda daing.  
 ANTI-buy woman fish  
 'The woman bought fish.'

The Lango construction in (4.45b) looks like a simple fronting of the undergoer, but it is in fact a voice construction; this is shown by the fact that the fronted NP takes over a number of syntactic control properties from the initial NP in (4.45a). The actor, *dákó* 'woman', remains a direct core argument and continues to control verb agreement and could control a reflexive anaphor. There seems to be no morphological difference between the two Sama sentences except for the nasal prefix on the verb which signals antipassivization. However, syntactically, there is an important difference: for extraction constructions, *daing* 'fish' would be the privileged syntactic argument in (4.46a), but *d'nda* 'woman' would have that function in (b) (see (5.3), (5.4)). However, in (b) *daing* 'fish' remains a direct core argument.<sup>16</sup>

It was mentioned in (4.15c) that there are many languages in which only undergoers may appear as privileged syntactic argument in a passive construction; German, Italian and Indonesian are three examples. Icelandic presents a very interesting situation in which privileged syntactic argument status in passives is not restricted to the undergoer argument of a transitive verb. The verb in (4.47) is a regular case-marking transitive verb; in (4.47a) the nominative argument is the privileged syntactic argument and is an actor, and the accusative argument is

<sup>16</sup> There is an important asymmetry between the argument modulation features of passives and antipassives. It is relatively unusual for passivization not to involve the actor being treated as a peripheral adjunct or omitted altogether, but it appears to be equally unusual for the undergoer in an antipassive to be treated as a peripheral adjunct. There are many examples of antipassives in which the undergoer seems to be completely unaffected, e.g. the Sama example above. In these languages the antipassive has only the PSA modulation component. In other cases, such as the Kalkatungu antipassive in (4.12b), the undergoer of the active voice seems to retain its core status but be stripped of its macrorole status, appearing in the dative case. The explanation for this contrast lies in the different syntactic potential of actor vs undergoer. Actor arguments are powerful syntactically and typically possess many controller and pivot properties, while undergoers typically do not. Hence leaving an undergoer as a direct core argument, regardless of whether it is a macrorole or not, is unlikely to lead to confusions regarding the agreement controller, reflexive antecedent or pivot in certain constructions. On the other hand, having the actor remain a direct core argument leads to potential ambiguity with respect to reflexive control, control of missing arguments in complex constructions, etc. Treating an actor as a peripheral adjunct indicates clearly that it has lost the controller and pivot properties which accrue to the undergoer in the passive construction.

an undergoer, while in (4.47b) the undergoer is privileged syntactic argument in a passive construction.

- (4.47) a. Lögregl-a-n                      tók                      Sigg-u                      fast-a.  
 police-FsgNOM-DEF take.PAST Sigg-a-FsgACC fast-FsgACC  
 'The police arrested Sigg-a.'
- b. Sigg-a                      va-r                      tek-in                      föst  
 Sigg-a-FsgNOM be.PAST-3sg take.PSTP-FsgNOM fast-FsgNOM  
 af lögregl-un-ni.  
 by police-DEF-FsgDAT  
 'Sigg-a was arrested by the police.'

Many apparently transitive verbs in Icelandic have 'direct objects' which are in the dative or genitive case, not the accusative, and as argued in Van Valin (1991), the undergoer of a transitive verb in Icelandic always receives accusative case in active voice (simple) sentences. From this it follows that none of the postverbal dative NPs in (4.48) are undergoers; hence these verbs are M-intransitive, despite having multiple arguments.<sup>17</sup>

- (4.48) a. Ég                      skila-ð-i                      henni                      pening-un-um.  
 1sgNOM return-PAST-1sg 3FsgDAT money-DEF-DAT  
 'I returned her the money.'
- b. Ég                      hjálpa-ð-i                      honum.  
 1sgNOM help-PAST-1sg 3MsgDAT  
 'I helped him.'

The dative rule in (4.29b) applies not only to ditransitive verbs like *dat* 'give' in Russian, *geben* 'give' in German, and *gefa* 'give' in Icelandic but also to multiple argument verbs which are M-intransitive. The Icelandic verbs *skila* 'give back, return' and *hjálpa* 'help' in (4.48) are good examples of multiple argument, M-intransitive verbs. Their single macrorole is an actor, which receives nominative case, but their remaining arguments are non-macrorole core arguments, which receive dative case. Traditionally such verbs are analysed as governing irregular case marking on some of their arguments, but in terms of the RRG analysis their only irregularity is in terms of transitivity: the macrorole assignment principles in (2.41a) predict that they should be M-transitive, but they are in fact M-intransitive. This would be indicated in their lexical entry, as discussed in section 2.4.2. But given the fact that they are M-intransitive, the case marking of their direct core arguments is completely regular in terms of (4.25) and (4.29).

A dative NP in Icelandic sentences like (4.48) may function as a true privileged syntactic argument in a passive construction, as can be seen in (4.49); in this way

<sup>17</sup> See Van Valin and LaPolla (1997:352–61) for detailed arguments in support of the conclusion that dative objects in Icelandic and German are non-macrorole core arguments.

Icelandic differs from German, in which ‘dative subjects’ in passives do not take on the behavioural properties of nominative ‘subjects’.<sup>18</sup>

- (4.49) a. Henni va-r skil-að pening-un-um.  
 3FsgDAT be.PAST-IMPER return-PSTP money-DEF-DAT  
 ‘She was returned the money.’
- a’. \*Pening-un-um va-r skil-að henni.  
 money-DEF-DAT be.PAST-IMPER return-PSTP 3FsgDAT  
 ‘The money was returned to her.’
- b. Honum va-r hjálp-að (af mér).  
 3MsgDAT be.PAST-IMPER help-PSTP (by 1sgDAT)  
 ‘He was helped (by me).’

Evidence that they are true privileged syntactic arguments comes from matrix-coding (raising) constructions. The relevant examples are given in (4.50).

- (4.50) a. Lögregl-a-n virðist hafa tek-ið Sigg-u  
 police-FsgNOM-DEF seem.IMPER have.INF take-PSTP Sigg-FsgACC  
 fast-a.  
 fast-FsgACC  
 ‘The police seem to have arrested Sigga.’
- b. Sigg-a virðist hafa ver-ið tek-in  
 Sigg-FsgNOM seem.IMPER have.INF be-PSTP take.PSTP-FsgNOM  
 föst af lögregl-un-ni.  
 fast.FsgNOM by police-DEF-FsgDAT  
 ‘Sigga seems to have been arrested by the police.’
- c. Honum virðist hafa ver-ið hjálp-að (af mér).  
 3MsgDAT seem.IMPER have.INF be-PSTP help-PSTP (by 1sgDAT)  
 ‘He seems to have been helped (by me).’

In (4.50a,b) the privileged syntactic argument of the linked core appears as the privileged syntactic argument of the matrix core, and the verb in the linked core is the regular case-marking verb illustrated in (4.47). The important example is (4.50c), in which the dative NP (which is the d-S of the passive construction) occurs as the privileged syntactic argument of the matrix core, just like the nominative NPs in (4.50a,b). This is evidence that the dative NP *honum* ‘him’ in (4.49b) functions as a true privileged syntactic argument with respect to constructions like this one.

Since these verbs do not have undergoers, the correct statement of the linking in the passive construction in Icelandic cannot be ‘U = PSA’; rather, it must be ‘~A = PSA’.<sup>19</sup> The characterization of the non-actor argument is an important question, as the ungrammaticality of (4.49a’) shows; with a verb like *skila* ‘return,

<sup>18</sup> All Icelandic examples are from Zaenen, Maling and Thráinsson (1985), Thráinsson (1979) and Andrews (1982); see these references for detailed discussion and exemplification of the privileged syntactic argument properties of the non-nominative ‘subjects’.

<sup>19</sup> See L. Roberts (1995) for an analysis of passivization in Icelandic and Old English within RRG.

give back' which takes two non-actor arguments, only one of them can be privileged syntactic argument in a passive. This verb has roughly the same LS as English *give*, i.e. [**do'** (x, Ø)] CAUSE [BECOME **have'** (y, z)], and accordingly in (4.48a) *ég* 'I' is the *x* argument, *henni* 'her' is the *y* argument, and *peningunum* 'the money' is the *z* argument. In terms of the privileged syntactic argument selection hierarchy in (4.14), *henni* outranks *peningunum*, and therefore when there are two non-macrorole arguments, the highest ranking direct core argument will be privileged syntactic argument. That *direct core argument* and not just core argument is the crucial notion can be seen in (4.51), in which *skila* appears with three core arguments but only two direct core arguments.

- (4.51) a. *Ég skila-ð-i pening-un-um til hennar.*  
 1sgNOM return-PAST-1sg money-DEF-DAT to 3FsgGEN  
 'I returned the money to her.'
- b. *Pening-un-um hefur ver-ið skil-að til hennar.*  
 money-DEF-DAT have.IMPER be-PSTP return-PSTP to 3FsgGEN  
 'The money was returned to her.'
- b'. \**Hennar hefur ver-ið skil-að pening-un-um (til).*  
 3FsgGEN have.IMPER be-PSTP return-PSTP money-DEF-DAT to  
 'She was returned the money.'

In (4.51a) the recipient (*y*) argument is not a direct core argument; it is marked by the preposition *til* 'to' and receives genitive case from it. In (4.51a), *peningunum* 'the money', the *z* argument, is the highest ranking non-actor *direct* core argument, while *til hennar* 'to her' is the highest ranking core argument, direct or oblique, but only *peningunum* can be privileged syntactic argument in a passive, as in (4.51b). Hence only direct core arguments can be privileged syntactic argument in a passive construction.

Icelandic thus differs from German in permitting non-macrorole arguments to function as the privileged syntactic argument in certain constructions. This contrast is stated in (4.15c), and it represents an important difference across languages. Thus for languages like German the privileged syntactic argument selection hierarchy is effectively Actor > Undergoer, while for languages like Icelandic it is the hierarchy in (4.14) referring to direct core arguments, which includes macrorole and non-macrorole arguments.

With respect to finite verb agreement in both languages, the agreement rule in (4.24) guarantees that the finite verb in German, for example, will agree with the privileged syntactic argument if there is one, since only macrorole arguments can function as privileged syntactic argument in the language. In an Icelandic sentence like (4.36a) the finite verb will agree with the nominative undergoer but not with the dative privileged syntactic argument. The nominative NP and the controller of finite verb agreement will coincide in Icelandic, even though the privileged syntactic argument for syntactic processes like matrix-coding and reflexive controller may be a different NP, as illustrated for matrix-coding in (4.36b,b'). Impersonal agreement of the kind found in (4.49b), for example, is a kind of default agreement which occurs when the rule in (4.24) cannot apply.



The second type of marked undergoer construction involves the occurrence of a non-argument of the verb as undergoer, the most frequent one being a beneficiary. This is exemplified in (4.52) for English and in (4.53) for Sama (Walton 1986).

- The logical structure for English *bake* or Sama *b'lli* 'buy' does not contain a beneficiary argument, and in the (a) sentences this argument appears as an oblique phrase. In the (b) sentences, however, it appears as undergoer, and in Sama this requires the addition of the *-an* suffix to the verb. Since Sama is syntactically ergative, the derived undergoer is also the privileged syntactic argument (see Walton 1986 for detailed discussion). This supports the point made above that undergoer, and not direct object, is the relevant notion for the description of these alternations. The occurrence of a beneficiary as undergoer is very common, and in some languages, e.g. many Bantu languages, there is no way to express a beneficiary except as undergoer in the 'applied verb' (applicative) construction. Examples from Chicheŵa (Baker 1988) and Kinyarwanda (Kimenyi 1980) are given in (4.54) and (4.55).<sup>20</sup> (In the glosses, the numbers refer to noun classes.)

- <sup>20</sup> The facts of Bantu applicative constructions are very complex, and a complete treatment of them is beyond the scope of this discussion. That the 'applied object' is undergoer is shown by its taking on all (Chicheŵa) or most (Kinyarwanda) of the properties of undergoers of underived transitive verbs. See L. Roberts (1995) for discussion of applicatives from an RRG perspective.

- (4.55) a. Umukoóbwa a-ra-som-a                      igitabo.                      Kinyarwanda  
 girl                      1-PRES-read-MOOD    book  
 'The girl is reading a book.'
- b. Umukoóbwa a-ra-som-er-a                      umuhuúngu igitabo.  
 girl                      1-PRES-read-APPL-MOOD    boy                      book  
 'The girl is reading the boy a book.'

One of the intriguing features of applicative constructions with beneficiaries is that in some Bantu languages the derived benefactive undergoer as well as the other direct core arguments of the verb can function as privileged syntactic argument in a passive construction. This is illustrated in (4.56) from Kinyarwanda.

- (4.56) a. Umugóre a-rá-hé-er-a                      umugabo ímbwa ibíryo.  
 woman    1-PRES-give-APPL-MOOD    man                      dog                      food  
 'The woman is giving food to the dog for the man.'
- b. Ibíryo bi-rá-hé-er-w-a                      umugabo ímbwa n'ûmugóre.  
 food    8-PRES-give-APPL-PASS-MOOD    man                      dog                      by-woman  
 'The food is being given to the dog for the man by the woman.'
- c. Ímbwa i-rá-hé-er-w-a                      umugabo ibíryo n'ûmugóre.  
 dog    4-PRES-give-APPL-PASS-MOOD    man                      food                      by-woman  
 'The dog is being given food for the man by the woman.'
- d. Umugabo a-rá-hé-er-w-a                      ímbwa ibíryo n'ûmugóre.  
 man                      1-PRES-give-APPL-PASS-MOOD    dog                      food                      by-woman  
 'The man benefits from the woman giving food to the dog.'  
 (lit. 'The man is being given food to the dog by the woman.')

These examples show that '∼A' is considerably more than just 'U' in the statement of passive in Kinyarwanda; as in Icelandic, direct core arguments other than the undergoer are possible as privileged syntactic argument in a passive construction.

Bantu languages also present a kind of derived 'object' construction in which a non-argument becomes a direct core argument but not undergoer. The examples in (4.57) are again from Kinyarwanda; in (4.57b) a non-argument locative and a possessor are coded as direct core arguments.

- (4.57) a. Úmwána y-a-andits-e                      izíná rye                      mu igitabo cy'umugabo.  
 child                      1-PAST-write-MOOD    name of.him    in    book                      of man  
 'The child wrote his name in the man's book.'
- b. Úmwána y-a-andik-i-yé-mo                      umugabo igitabo izíná rye.  
 child                      1-PAST-write-APPL-MOOD-LOC    man                      book                      name of.him  
 'The child wrote in the man's book his name.'

There are three direct core arguments after the verb in (4.57b), but, unlike (4.56a), only *umugabo* 'man', the undergoer (the applied 'object'), has the syntactic properties of the undergoer of a non-derived transitive verb, e.g. the ability to function as privileged syntactic argument in a passive construction. *Igitabo* 'book' is coded

as a peripheral oblique in (4.57a) but as a direct core argument in (4.57b); it is not, however, the undergoer.

Applicative constructions (and their cousins, the dative shift, transfer and locative alternations) pose a variety of interesting problems for linguistic theory, but they do not motivate the postulation of a direct object grammatical relation. The notions of undergoer and direct core argument provide the basis for the description and ultimately for the explanation of these phenomena.

A further problem for traditional notions of grammatical relations are what Dryer (1986) called ‘primary object languages’; in these languages the only pattern that occurs with three-argument verbs corresponds to (4.40a’), not (4.40a). Lakhota provides a simple example of this.

- (4.58) a. Mathó ki hená šŭka eyá wičhá-kte-pi.  
 bear the those dog some 3plU-kill-3plA  
 ‘Those bears killed some dogs.’
- b. Wíŷa ki mathó wá hokšíla ki hená wičhá-Ø-kipázo/\*Ø-Ø-kipázo.  
 woman the bear a boy the those 3plU-3sgA-show/3sgU-3sgA-show  
 ‘The woman showed those boys a bear.’
- c. *kipázo* ‘show’ [do’(wíŷa, Ø)] CAUSE [BECOME see’ (hokšíla [y], mathó [z])]

In (4.58a) with a transitive verb, the plural animate undergoer is coded by the prefix *wičha-* on the verb. With a three-argument verb like *kipázo* ‘show’, which of the non-actor arguments is coded as the undergoer? As (4.58b) clearly attests, it is not the lowest ranking argument in the LS that functions as undergoer, as would be the case in a construction like (4.40a), but rather the higher ranking *y* argument. Moreover, there is no construction in Lakhota with a three-argument verb in which the *z* argument would be the undergoer. Because this pattern is distinct from the traditional ‘direct object’ – ‘indirect object’ pattern of (4.40a), Dryer labels it the ‘primary object’ – ‘secondary object’ pattern, with *hokšíla ki hená* ‘those boys’ as the primary object and *mathó wá* ‘a bear’ as the secondary object in (4.58b). In the English example in (4.40a’), *Kim* would be the primary object and *the flowers* the secondary object.

In RRG terms, primary object languages allow only the marked selection for undergoer, in terms of the actor–undergoer hierarchy. How can this be explained? There would appear to be two approaches within RRG. The first, put forth in Van Valin and LaPolla (1997), section 7.4.1, maintains that undergoer selection based on the actor–undergoer hierarchy is affected by a general principle to the effect that if there is an animate (human) argument as a potential undergoer, then it must be undergoer. In the usual situation involving transfer verbs, in which the recipient is normally human or animate and the theme inanimate, this correctly predicts that the animate recipient would be selected as undergoer, as in, e.g., (4.40a’). However, examples like (4.58b) present a problem for this analysis. While it is certainly the case that the undergoer in (4.58b) is animate, the non-undergoer theme is also

animate, and therefore this principle does not really explain examples like this one, even though they do not contradict it. The alternative analysis claims that undergoer selection is based on the principle ‘select the second highest ranking argument in the logical structure as undergoer’. With a simple transitive verb, undergoer selection will work exactly the same way as in direct–indirect object languages, but when the verb has three arguments, this will always select the *y* argument as undergoer, never the *z* argument.

The superiority of this second analysis can be seen clearly in the analysis of causative constructions in primary object languages. Yaqui (Uto-Aztecan) is a primary object language (Félix 2000), and the following examples from Guerrero Valenzuela and Van Valin (2004) illustrate three-place verbs and causatives.

- (4.59) a. Joan-Ø      Peo-ta      ?uka      vaci-ta      miika-k.  
 Juan-NOM Pedro-ACC DET.ACC corn-ACC give-PERF  
 ‘Juan gave Pedro the corn.’
- b. Peo-Ø      ?uka      vaci-ta      miik-wa-k.  
 Pedro-NOM DET.ACC corn-ACC give-PASS-PERF  
 ‘Pedro was given the corn.’
- b’. \*U?u      vaci-Ø      Peo-ta      miik-wa-k.  
 DET.NOM corn-NOM Pedro give-PASS-PERF  
 ‘The corn was given Pedro.’

In (4.59a) both non-privileged syntactic argument NPs are in the accusative case; which one is the undergoer and which one is the non-macrorole direct core argument? The answer is given by passive; in Yaqui only the undergoer can be privileged syntactic argument in a passive, and the actor is obligatorily omitted. Of the two logically possible passive versions of (4.59a), only (4.59b) with the recipient as privileged syntactic argument is grammatical. Hence the recipient *Peo* ‘Pedro’ is the undergoer in (4.59a). The facts in (4.59) could be accounted for by either of the analyses given above. A causative construction involving *miika*- ‘give’ presents an interesting problem, since there will be at least two non-privileged syntactic argument animate NPs; which one is the undergoer of the derived causative verb *miik-tua* ‘cause to give’? Again, passive provides the crucial evidence.

- (4.60) a. U?u      maejto usi-ta      mansana-ta yoem-ta      miik-tua-k.  
 DET.NOM teacher child-ACC apple-ACC man-ACC give-CAUS-PERF  
 ‘The teacher made the child give the man the apple.’
- b. U?u      usi-Ø      mansana-ta yoem-ta      miik-tua-wa-k.  
 DET.NOM child-NOM apple-ACC man-ACC give-CAUS-PASS-PERF  
 ‘The child was made to give the man the apple.’
- b’. \*Yoem-Ø      usi-ta      mansana-ta miik-tua-wa-k.  
 man-NOM child-ACC apple-ACC give-CAUS-PASS-PERF

- b''. \*Mansana-Ø *usi-ta* *yoem-ta* *miik-tua-wa-k*.  
 apple-NOM child-ACC man-ACC give-CAUS-PASS-PERF
- c. [**do'** (maejto, Ø)] CAUSE [[**do'** (*usi*, Ø)] CAUSE [BECOME **have'** (*yoem*, *mansana*)]]

The only grammatical version of (4.60a) is (4.60b) with the causee *usi* 'child' as privileged syntactic argument, and this shows that the undergoer in (4.60a) is *usi-ta* 'the child-ACC'. With respect to the logical structure of (4.60a) in (4.60c), the animate-as-undergoer principle does not uniquely pick out *usi* 'child' as the undergoer, although it is compatible with it. However, the 'second highest argument in logical structure' principle for selecting the undergoer does correctly identify *usi* 'child' as the unique undergoer choice, and therefore it appears to be the correct characterization of undergoer selection in primary object languages.

The situation in Yaqui is in fact more complex and hence even more interesting. There are verbs, such as *nenka* 'sell', which lexicalize the English pattern. This is exemplified in (4.61).

- (4.61) a. Joan-Ø *Peo-ta-u* *ju-ka* *kaba'i-ta* *nenka-k*.  
 Juan-NOM Pedro-ACC-DIR DET-ACC horse-ACC sell-PERF  
 'Juan sold the horse to Pedro.'
- b. Ju-Ø *kaba'i-Ø* *Peo-ta-u* *nanka-wa-k*.  
 DET-NOM horse-NOM Pedro-ACC-DIR sell-PASS-PERF  
 'The horse was sold to Pedro.'
- b'. \*Peo-Ø *ju-ka* *kaba'i-ta* *nenka-wa-k*.  
 Pedro-NOM DET-ACC horse-ACC sell-PASS-PERF  
 'Pedro was sold the horse.'

With *nenka* 'sell', the theme is the undergoer and the recipient is marked by the postposition *u* 'to'. Hence in a passive, the undergoer-theme appears as the privileged syntactic argument, rather than the undergoer-recipient as in (4.59). Moreover, there are verbs in Yaqui which exhibit the locative alternation; one of them is *chijakta*- 'sprinkle', illustrated in (4.62). (The data are from Guerrero and Van Valin 2004.)

- (4.62) a. Empo *kafe-ta* *mesa-po* *chijakta-k*.  
 2sgNOM coffee-ACC table-LOC sprinkle-PERF  
 'You sprinkled coffee on the table.'
- a'. Kafe-Ø *mesa-po* *chijakta-wa-k*.  
 coffee-NOM table-LOC sprinkle-PASS-PERF  
 'Coffee was sprinkled on the table.'
- a''. \*Mesa-Ø *kafe-ta* *chijakta-wa-k*.  
 'The table was sprinkled coffee.'
- b. Empo *kafe-ae* *mesa-ta* *chijakta-k*.  
 2sgNOM coffee-INST table-ACC sprinkle-PERF  
 'You sprinkled the table with coffee.'

- b'. Mesa-Ø kafe-ae chijakta-wa-k.  
table-NOM coffee-INST sprinkle-PASS-PERF  
'The table was sprinkled with coffee.'
- b''. \*Kafe mesa-ta chijakta-wa-k.  
'Coffee was sprinkled table.'
- c. [do' (2sg, [sprinkle' (2sg, kafe)])] CAUSE [BECOME be-on' (mesa, kafe)]

The pattern here is the same as in the English examples in (4.40b,b'). In (4.62a), the lowest ranking argument in the logical structure in (4.62c), *kafe* 'coffee', is selected as undergoer, and the other argument is marked by the locative postposition *-po*. It is the undergoer argument that appears in the nominative case in the passive in (a'). In the alternative form in (b), the location argument, *mesa* 'table', is selected as undergoer; it appears in the accusative case, and the conditions for the instrumental case rule are met, resulting in *kafe* 'coffee' being marked by the instrumental case.

What these examples show is that there are three different patterns in Yaqui: the direct-indirect object pattern in (4.61), the primary object pattern in (4.59) and the locative alternation pattern in (4.62). Yaqui is considered to be a primary object language, because the pattern in (4.59) is found with many ditransitive verbs and is the pattern found in all derived verb forms, such as the causative verbs in (4.60).

This analysis has important implications for the actor-undergoer hierarchy: the principle governing the selection of the undergoer argument is different in primary object languages from direct object languages, and consequently the markedness relations expressed in Figure 2.4 are not true universally. Accordingly the hierarchy must be stated as in Figure 4.4. The actor selection principle is the same as before. When the verb has only two arguments, then the two undergoer selection principles are equivalent and always pick out the same argument as undergoer. However, when the verb has three arguments, then the difference between the two principles comes into play, yielding the different patterns with ditransitive verbs seen above. English dative shift could be viewed either as a marked undergoer selection in terms of Principle A or as the application of Principle B. In Yaqui clearly both principles are operative: some lexical verbs and all derived verbs follow Principle B, some verbs take Principle A as an absolute, not as a default, e.g. *nenka* 'sell', while others take Principle A as a default, e.g. *chijakta* 'sprinkle'.

ACTOR		UNDERGOER	
Arg. of DO	1st arg. of do' (x,...	1st arg. of pred' (x, y)	2nd arg. of pred' (x, y)
			Arg. of pred' (x)
Actor selection: highest ranking argument in LS			
Undergoer selection:			
Principle A: lowest ranking argument in LS (default)			
Principle B: second highest ranking argument in LS			

Figure 4.4 Actor-undergoer hierarchy (revised)

It should be noted that this contrast in undergoer selection principles is independent of the privileged syntactic argument selection principles of the language, as is to be expected. Both types are found in syntactically accusative and syntactically ergative languages. English and Yaqui are both syntactically accusative, while Dyirbal (an indirect object language) and Belhare (a secondary object language; Bickel 2002) are syntactically ergative.<sup>21</sup>

<sup>21</sup> Given this typological fact, it is perhaps better to refer to these two types of languages as ‘indirect object’ and ‘secondary object’ languages, avoiding the potential problem of saying that, e.g., Dyirbal is a syntactically ergative, direct object language. See Guerrero and Van Valin (2004) for more detailed discussion.

## 5 Linking syntactic and semantic representations in simple sentences

### 5.0 General considerations

The various components of a description of grammatical structure have been presented (clause structure, lexical representation and semantic roles, syntactic functions, focus structure), and now the principles that link them together will be presented. They illustrate the workings of the syntax–semantics–pragmatics interface. The linking algorithm is central to a theory like RRG that posits only one level of syntactic representation, for it must be able to deal not only with canonical clause patterns, i.e. those in which the default correlations between syntactic and semantic structure exist, but also with the non-canonical patterns as well. The general linking schema in RRG may be sketched as in Figure 5.1 on p. 129. The relation between logical structure and macroroles is mediated by the actor–undergoer hierarchy in Figure 4.4. The relation between macroroles (and non-macrorole arguments of the verb) and morphosyntactic functions is subject to extensive cross-linguistic variation and is affected by the privileged syntactic argument selection hierarchy in (4.14) and selection principles in (4.15) and by the extent to which focus structure is grammaticalized in clause-internal relational syntax (see Figure 4.3).

The opposition labelled ‘universal’ vs ‘language-specific’ in Figure 5.1 reflects the fact that there is very little cross-linguistic variation in the lexical phase of the linking and a great deal of cross-linguistic variation in the syntactic phase. The primary variation in the lexical phase is limited to three areas: what role animacy plays in macrorole assignment (e.g. in Lakhota, actor NPs must be animate), whether a language allows variable undergoer selection, and whether the language follows the ‘indirect object’ pattern of lowest-ranking argument in logical structure as undergoer or the ‘secondary object’ pattern of second-highest ranking argument in logical structure as undergoer. One of the most intriguing findings in Van Valin and LaPolla (1997) is a correlation between semantic motivation and universality: the more semantically motivated or semantically driven a grammatical phenomenon is, the less likely it is to show cross-linguistic variation (see also Van Valin 2003). An example of this has already been discussed in chapter 1: the units of the layered structure of the clause are semantically motivated and universal, while other constituents such as the left-detached position and the precore slot are pragmatically rather than semantically motivated and are not universal.



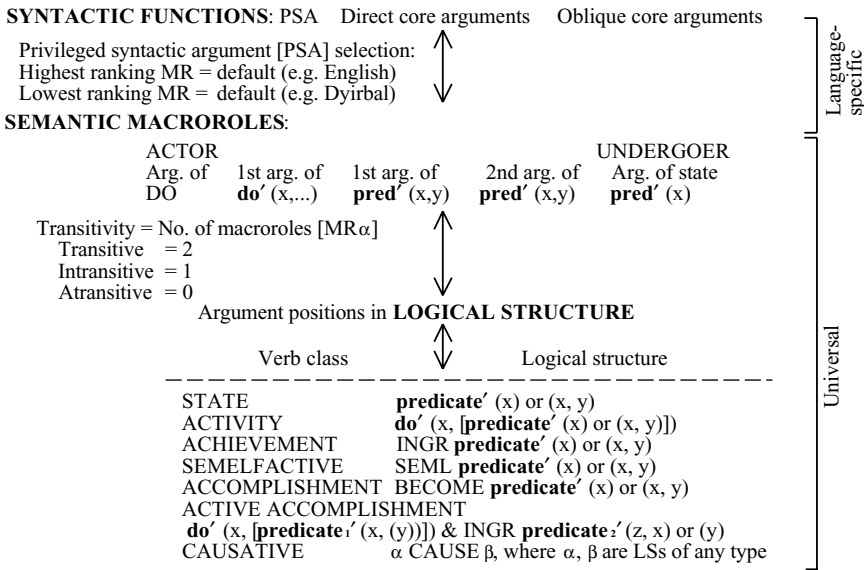


Figure 5.1 Summary of RRG linking system

## 5.1 The linking algorithm

A distinctive feature of the RRG linking algorithm is that it is bidirectional; that is, it links the semantic representation to the syntactic representation, and it also links the syntactic representation to the semantic representation. Viewed in terms of a language processing model, the semantics-to-syntax linking is an aspect of the production process, while the syntax-to-semantics linking is an aspect of the comprehension process. In the comprehension process, the parser would take the input and produce a structured syntactic representation of it, identifying the elements of the layered structure of the clause and the cases, adpositions and other grammatically relevant elements in the sentence. It is then the task of the grammar to map this structure into a semantic representation, as the first step in interpreting it, and this is where the syntax-to-semantics linking algorithm is required. The same syntactic and semantic representations are used in both linking algorithms.<sup>1</sup>

The linking between semantic and syntactic representations is governed by a very general constraint, the completeness constraint, which is stated in (5.1).

- (5.1) 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

<sup>1</sup> For discussions of RRG in relation to theories of sentence processing, both production and comprehension, see Butler (2004) and Van Valin (2005).

referring expressions 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.<sup>2</sup>

In simple sentences, this guarantees that there will be a match between the number of arguments in the clause and in the logical structure of the verb. As will be seen in chapter 7, it is extremely important in linking in complex sentence constructions.

The semantic representation of a sentence is built around the logical structure of the predicator, usually a verb, and it is put together in the lexicon. For the semantics-to-syntax linking, the information in the semantic representation is crucial for the selection of the syntactic template(s) constituting the syntactic representation. In chapter 1, it was suggested that syntactic representations were best conceived of as ‘syntactic templates’, stored in what is called the ‘syntactic inventory’. There are principles governing the selection of the appropriate core template; they are given in (5.2).

- (5.2) a. Syntactic template selection principle:  
The number of syntactic slots for arguments and argument adjuncts within the core is equal to the number of distinct specified argument positions in the semantic representation of the core.
- b. Language-specific qualifications of the principle in (a):
1. All cores in the language have a minimum syntactic valence of 1.
  2. Argument-modulation voice constructions reduce the number of core slots by 1.
  3. The occurrence of a syntactic argument in the pre/postcore slot reduces the number of core slots by 1 (may override (1) above).

The default principle in (5.2a) is straightforward: if a verb takes  $n$  arguments, then there needs to be  $n$  positions in the core for those arguments to appear in, in order to satisfy the completeness constraint in (5.1). The exceptions in (b) are language-specific: all of them apply to English, which requires dummy subjects for argumentless verbs like *rain*, which has a passive and in which WH-words occur in the precore slot, while none of them apply to Lakhota, for example.

An example of an English syntactic template for a simple sentence with a transitive verb and one for an NP are given in Figure 5.2. Following the suggestion

<sup>2</sup> ‘Explicitly specified’ means that the argument position in the logical structure is filled by a variable or a constant; for it to be unspecified, it would be filled by ‘Ø’, as in (i).

- (i) a. Max loaded the minivan.  
b. [do'(Max, Ø)] CAUSE [BECOME **be-in'** (minivan, Ø)]  
b'. [do'(Max, Ø)] CAUSE [BECOME **be-in'** (minivan, the boxes)]

The logical structure in (ib) does not specify what the second argument of **be-in'** is, unlike the one in (ib'), and it is not specified in the sentence in (ia). Hence only (ib) is a legitimate logical structure for (ia), because of the completeness constraint.

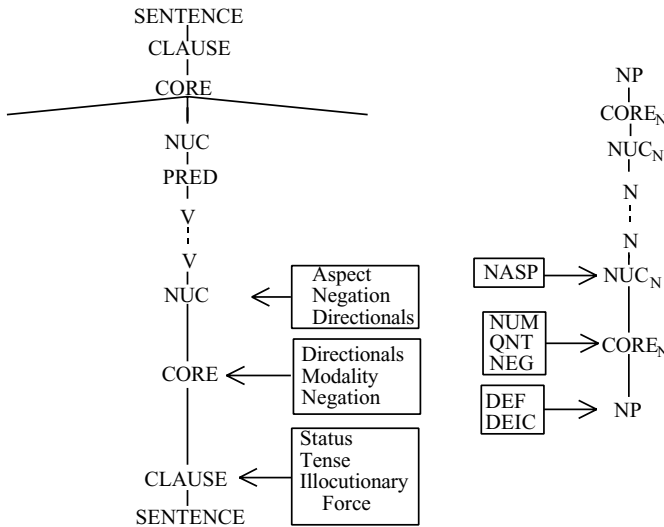


Figure 5.2 *Syntactic templates for a simple clause and an NP in English*

made in section 1.3, the core template will not carry categorial specifications for its positions. The operators that will be needed in a particular sentence or NP are a function of its semantic representation (cf. sections 2.2, 2.3). Peripheries are not specified in the templates, as they are always optional.

For syntax-to-semantics linking, the syntactic representation is created by the parser, as stated earlier. These considerations lead to a revised picture of the organization of RRG; it is presented in Figure 5.3.

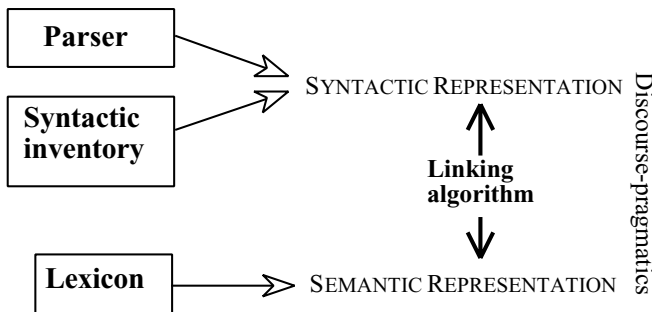


Figure 5.3 *Organization of Role and Reference Grammar (revised)*

### 5.1.1 Constructional schemas

RRG recognizes the importance of grammatical constructions, and they are represented in terms of constructional schemas. Cross-constructional and cross-linguistic generalizations are captured in terms of the general principles

and constraints that constitute the linking algorithms, e.g. the actor–undergoer hierarchy, the layered structure of the clause, the privileged syntactic argument selection hierarchy. Only the idiosyncratic, language-specific features of constructions are represented in constructional schemas.<sup>3</sup> Hence constructional schemas, by virtue of their reference to general principles, permit the capturing of cross-linguistic generalizations, while at the same time expressing language-particular properties of grammars.

The English passive construction is a good example of interaction of the general and the language-specific. The general characterization of voice constructions in (4.43) defines the general features of a passive construction, but the specific features of the English passive are represented in the constructional schema in Table 5.1. Each constructional schema contains syntactic, morphological, semantic and pragmatic information about the construction in question. This schema expresses the specific features of the English passive.

Table 5.1 *Constructional schema for English passive (plain)*

CONSTRUCTION: English passive (plain)
SYNTAX:
Template(s): (5.2b2)
PSA: (4.15a,c2), Variable [ $\pm$ pragmatic influence]
Linking: (4.43a)
(4.43b): omitted or in peripheral <i>by</i> -PP
MORPHOLOGY:
Verb: past participle
Auxiliary: <i>be</i>
SEMANTICS:
PSA is not instigator of state of affairs but is affected by it (default)
PRAGMATICS:
Illocutionary force: unspecified
Focus structure: no restrictions; PSA = topic (default)

As an example of cross-linguistic comparison, consider the English and Sama WH-question constructions. Sama is a syntactically ergative language, and both languages have a precore slot in which the WH-word appears. However, there is a restricted neutralization in Sama: the WH-word must be the S, U<sub>T</sub> or d-S of the clause. This is illustrated in (5.3).

- (5.3) a.    Say    nda'    d'nda?  
          who see    woman  
          'Who did the woman see?' (\*'Who saw a woman?')
- b.    Say    N-nda'    d'nda?  
          who ANTI-see woman  
          'Who saw a woman?' (\*'Who did the woman see?')

<sup>3</sup> These were termed 'constructional templates' in Van Valin and LaPolla (1997).

Table 5.2 *Constructional schema for Sama antipassive*

---

CONSTRUCTION: Sama antipassive

---

## SYNTAX:

Template(s): (5.2)

PSA: (4.15b,c1), Variable [ $\pm$  pragmatic influence] = immediate  
postverbal direct core argument

Linking: (4.43a)

(4.43b): none if U is 3rd person; oblique core argument if U is  
non-3rd person

## MORPHOLOGY:

Verb: *N-* + verb stemOblique core argument: *ma* + pronoun

## SEMANTICS:

PSA is instigator of state of affairs

*Aktionsart* = atelic (default)

## PRAGMATICS:

Illocutionary force: unspecified

Focus structure: U = non-specific (default)

PSA = topic (default)

---

When the WH-word is the undergoer, the plain form of the verb is used, as in (5.3a), but if it is the actor, then the antipassive form of the verb must be used, as in (b). The constructional schema for the Sama antipassive is given in Table 5.2. The fact that there is a restricted neutralization with respect to the WH-word in questions means that there is never any ambiguity as to the function of the WH-word in the precore slot in Sama, unlike in English. The constructional schemas for English and Sama WH-question constructions are given in Tables 5.3 and 5.4. The syntactic template, semantics and pragmatics of the two constructions are the same; the crucial difference between them lies in the lack of a restricted

Table 5.3 *Constructional schema for English WH-questions*

---

CONSTRUCTION: English WH-question

---

## SYNTAX:

Template(s): PrCS, (5.2a,b3)

PSA: None

Linking: WH-XP to PrCS

## MORPHOLOGY: Default

## SEMANTICS:

contains an open proposition with a variable  $\alpha$ , WH-XP =  $\alpha$ 

## PRAGMATICS:

Illocutionary force: interrogative

Focus structure: narrow focus on PrCS

---

Table 5.4 *Constructional schema for Sama WH-question formation*

CONSTRUCTION: Sama WH-question formation
SYNTAX: Template(s): PrCS, (5.2a,b3) PSA: (4.15b,c1), WH-NP = Variable pivot [+ pragmatic influence] Linking: WH-NP to PrCS Antipassive, if WH-NP $\neq$ default choice for PSA
MORPHOLOGY: None
SEMANTICS: Contains an open proposition with variable $\alpha$ , WH-NP = $\alpha$
PRAGMATICS: Illocutionary force: interrogative Focus structure: narrow focus on PrCS

neutralization in the English construction and the existence of a variable syntactic pivot in the Sama construction.

Constructional schemas play an important role in linking in both directions. This leads to a revision of the organization of RRG, which is presented in Figure 5.4. For the semantics-to-syntax linking they supply the language-specific and construction-specific details which are required for the correct encoding of meaning in the morphosyntax. They play a crucial role in the syntax-to-semantics linking, especially in languages which have different privileged syntactic arguments for different constructions (e.g. Jakaltek, Sama), because they specify what the privileged syntactic argument is in the construction, which is central to the linking. As an example, consider the interaction of WH-question formation and reflexivization in Sama. In this language, the actor is always the controller for reflexivization, regardless of whether the clause is active or antipassive voice. The schema for Sama reflexivization is given in Table 5.5. (The role hierarchy and LS-superiority conditions will be introduced in section 5.3.)

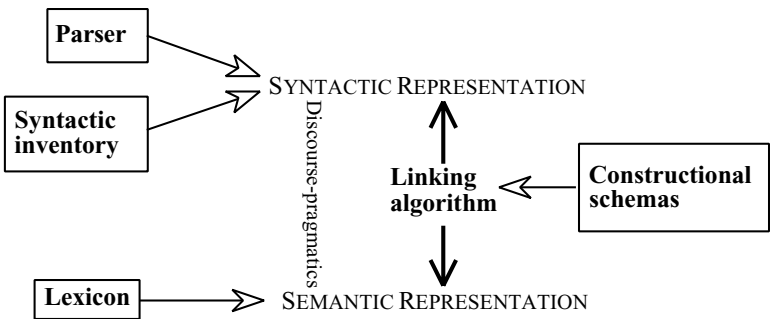


Figure 5.4 *Organization of Role and Reference Grammar (final)*

Table 5.5 *Constructional schema for Sama reflexivization*

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CONSTRUCTION: Sama reflexivization

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## SYNTAX:

Template(s): (5.2a)

PSA: semantic controller = actor

Linking: Actor = direct core argument

## MORPHOLOGY:

Reflexive: *di* + genitive pronoun (person, number)

## SEMANTICS:

Actor and reflexive pronoun are obligatorily coreferential within the clause

Subject to role hierarchy and LS-superiority conditions

## PRAGMATICS:

Illocutionary force: unspecified

Focus structure: unspecified

---

The interaction of these two constructions is illustrated in (5.4).

- (5.4) a.    B'lli d'nda    daing ma di-na.  
           buy woman fish    for REFL-3sg  
           'The woman bought the fish for herself.'
- a'.    Ay    b'lli d'nda    ma di-na?  
           what buy woman for REFL-3sg  
           'What did the woman buy for herself?'
- b    N-b'lli    d'nda    daing ma di-na.  
           ANTI-buy woman fish    for REFL-3sg  
           'The woman bought fish for herself.'
- b'.    Say n-b'lli    daing ma di-na?  
           who ANTI-buy fish    for REFL-3sg  
           'Who bought fish for him/herself?'

In (5.4a), *d'nda* 'woman', the actor NP, is the controller of the reflexive *dina*. This is also the case in the WH-question in (a'); in this sentence, the actor is the privileged syntactic argument (semantic controller) for reflexivization, and the undergoer is the privileged syntactic argument (syntactic pivot) for WH-question formation. The third example presents a clause in the antipassive voice, and the actor *d'nda* is the controller of the reflexive. In the final example, the privileged syntactic argument of the WH-question and the privileged syntactic argument of reflexivization are the same argument, the actor NP *say* 'who'. Thus, the analysis of (5.4a',b') involves three constructional schemas: the one for antipassive voice in Table 5.2, the one for WH-questions in Table 5.4, and the one for reflexivization in Table 5.5. The syntax-to-semantics linking algorithm for Sama would refer to these schemas at crucial points to guide the interpretive process (see Figure 5.21).

### 5.1.2 From semantics to syntax

The linking procedure from semantics (logical structure) to syntax (layered structure of the clause) is summarized in (5.5).<sup>4</sup> These are the general linking principles, which may be overridden by the specific requirements of a construction as expressed in its constructional schema.

- (5.5) Linking algorithm: semantics  $\rightarrow$  syntax
1. Construct the semantic representation of the sentence, based on the logical structure of the predicator.
  2. Determine the actor and undergoer assignments, following the actor–undergoer hierarchy in Figure 4.4.
  3. Determine the morphosyntactic coding of the arguments
    - a. Select the privileged syntactic argument, based on the privileged syntactic argument selection hierarchy and principles in (4.14)–(4.15).
    - b. Assign the arguments the appropriate case markers and/or adpositions.
    - c. Assign the agreement marking to the main or auxiliary verb, as appropriate.
  4. Select the syntactic template(s) for the sentence following the principles in (5.2).
  5. Assign arguments to positions in the syntactic representation of the sentence.
    - a. Assign the [–WH] argument(s) to the appropriate positions in the clause.
    - b. If there is a [+WH] argument of a logical structure,
      1. assign it to the normal position of a non-WH-argument with the same function, or
      2. assign it to the precore or postcore slot, or
      3. assign it to a position within the potential focus domain of the clause (default = the unmarked focus position).
    - c. A non-WH argument may be assigned to the precore or postcore slot, subject to focus structure restrictions (optional).
    - d. Assign the [–WH] argument(s) of logical structure(s) other than that of the predicator in the nucleus to
      1. a periphery (default), or
      2. the precore or postcore slot, or
      3. the left- or right-detached position.

All steps are all subject to cross-linguistic variation. As discussed in section 4.5, some languages allow variable undergoer selection while others do not, and languages differ as to the principle governing undergoer selection (indirect object vs secondary object languages) (step 2). The privileged syntactic argument selection principles in (4.15) vary along two major parameters, accusative vs ergative privileged syntactic argument selection and whether privileged syntactic argument

<sup>4</sup> The linking algorithm in (5.5) differs from the one presented in Van Valin and LaPolla (1997) in two ways. First, steps 1 and 4 are presupposed by the algorithm presented there, and they are made explicit here. Second, the order of the steps is somewhat different; the reasons for this change will be spelled out below.



selection is restricted to macrorole arguments or not (step 3a); information from constructional schemas can play a crucial role at this point. Case and agreement show substantial cross-linguistic variation (step 3b,c). The positions to which XPs are assigned in sentences varies not only within languages but across languages (step 5a), and the possibilities under step 5b cover the range of WH-question types found in human languages. Thus (5.5) lays out the general linking algorithm, which would have to be specialized for each individual language.

The workings of (5.5) can be illustrated by going through it with respect to the realization of several related versions of a sentence. As an example, let's take a speaker wanting to express that Sandy transferred some flowers to Chris at a party. There are a number of verbs that could be used here, and in this instance the speaker chooses *present*. The system in (5.5) presumes that a speaker is realizing a specific communicative intention, and consequently whether the sentence will be, e.g., active or passive, declarative or interrogative, figures into the formulation of the semantic representation and concomitant syntactic template selection. Moreover, the discourse status (activation level) of the referents of the NPs is also represented (see section 3.4). The output of step (1), which takes place in the lexicon (see section 5.2), is given in Figure 5.5. The operators for the NPs are not represented here, in the interest of space.

$\langle_{\text{IF}} \text{DEC} \langle_{\text{TNS}} \text{PAST} \langle \text{be-at}' (\text{party}_{\text{ACS}}, [[\text{do}' (\text{Sandy}_{\text{ACV}}, \emptyset)] \text{CAUSE} [\text{BECOME} \text{have}' (\text{Chris}_{\text{ACS}}, \text{flowers}_{\text{ACV}})])]] \rangle \rangle \rangle$

Figure 5.5 Output of step 1 in (5.5)

The next step is actor and undergoer assignment; this is illustrated in Figure 5.6, in which irrelevant details are not specified.<sup>5</sup> This reflects the unmarked or default macrorole assignments for English: the leftmost argument, *Sandy*, is the actor, and the rightmost argument, the *flowers*, is the undergoer. This leaves the third NP, *Chris*, as a non-macrorole argument. The representation in Figure 5.6 is not a distinct level of representation from the one in Figure 5.5; rather, it is simply the same representation enriched with additional information, namely the

$\dots[\text{do}' (\text{ACT: Sandy}_{\text{ACV}}, \emptyset)] \text{CAUSE} [\text{BECOME} \text{have}' (\text{NMR: Chris}_{\text{ACS}}, \text{UND: flowers}_{\text{ACV}})] \dots$

Figure 5.6 Output of step 2 in (5.5)

assignment of macroroles. The next step concerns the morphosyntactic properties of the arguments, specifically privileged syntactic argument selection and case/adposition assignment. The most important part of step (3) is privileged

<sup>5</sup> When a single participant appears in more than one argument position in a logical structure, as in  $[\text{do}' (x, \emptyset)] \text{CAUSE} [\text{BECOME} \text{have}' (x, y)]$  'take' or  $\text{do}' (x, [\text{eat}' (x, y)])$  &  $[\text{INGR} \text{consumed}' (y)]$  'eat' (active accomplishment), its linking properties with respect to actor are determined by the higher ranking position and with respect to undergoer by the lower ranking position. So with *take* the *x* argument is both effector and recipient, and the linking rules treat it as an effector with respect to actor selection; similarly, with *eat* the *y* argument is both consumed and patient, and it is treated as a patient with respect to macrorole selection.



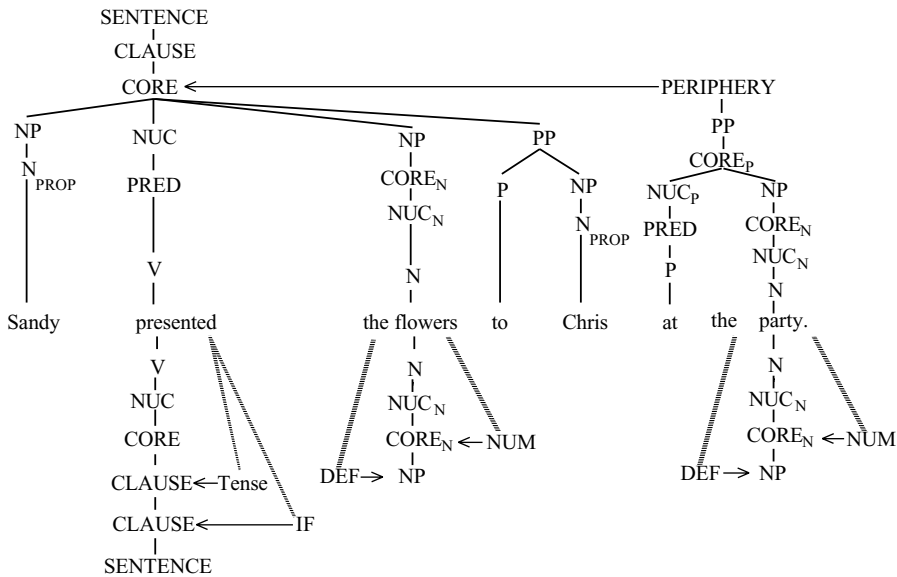


Figure 5.9 Result of all steps in (5.5)

projection in the syntactic representation of the NP; of these operators, only definiteness and number are realized overtly in the morphosyntax. The same would be true for the NP *the party*. The NPs would be linked to their respective NP templates. The final step involves linking the XPs into the structure in Figure 5.8; this is represented in Figure 5.9. The NP *Sandy*, as the privileged syntactic argument, is linked to the core-initial position, and the NP *the flowers*, as the undergoer, is linked to the immediately postverbal position. The PP *to Chris* follows the undergoer as the last phrase in the core. The fact that the order in the core must be NP V NP PP follows from independent, language-specific principles: in English, the privileged syntactic argument must be the first NP in the core, and the undergoer (when it is not the privileged syntactic argument) must immediately follow the nucleus. The predicative adjunct PP *at the party* is linked to the periphery<sub>CORE</sub>. The verb *present* is linked to the nucleus and is inflected for past tense, and the core-internal position of the morpheme expressing the tense operator signals declarative illocutionary force.

It will not be possible to give this much detail for every sentence that will be analysed, and consequently the steps illustrated in Figures 5.4 through 5.8 can be abbreviated as in Figure 5.10. In such abbreviated diagrams, the operator projections and the internal structure of NPs and PPs will not be specified unless it is relevant to the point under discussion. All of the relevant linking information from Figures 5.4–5.8 is summarized in Figure 5.10 on the next page, with the outputs from steps (2) and (3) depicted above the semantic representation of the sentence for clarity.

The alternative undergoer choice is presented in Figure 5.11. In this sentence *Chris* is selected as undergoer, rather than *the flowers*. Because there is a marked

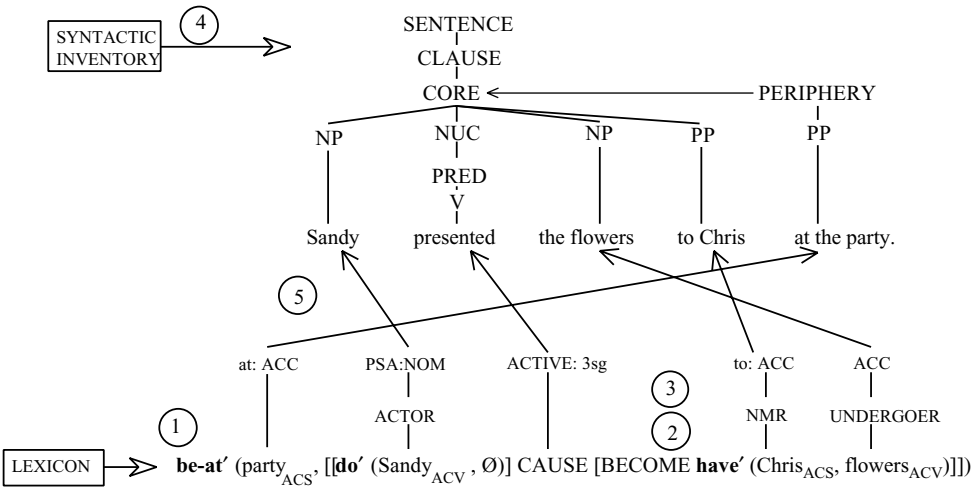


Figure 5.10 Abbreviated linking diagram summarizing Figures 5.5–5.9

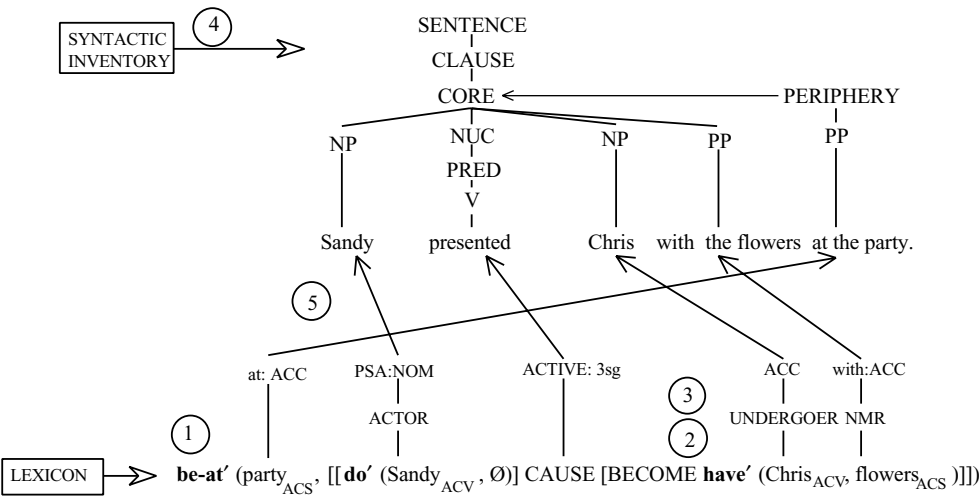


Figure 5.11 Linking in sentence with marked undergoer choice with present

undergoer choice, the *with* assignment rule in (4.29a) applies, resulting in the NP *the flowers* being marked by *with*. These last two figures represent the two possible active voice linkings with *present*; one of the possible passive voice linkings is given in Figure 5.12. The macrorole assignments in Figure 5.12 are the same as in Figure 5.11, but in this figure the undergoer rather than the actor is selected as the privileged syntactic argument, yielding a passive construction. Accordingly, the actor NP *Sandy* is assigned the preposition *by* and is linked to a position in the periphery<sub>CORE</sub>, while the undergoer NP *Chris* is linked to the core-initial privileged syntactic argument position, following the constructional schema in Table 5.1.

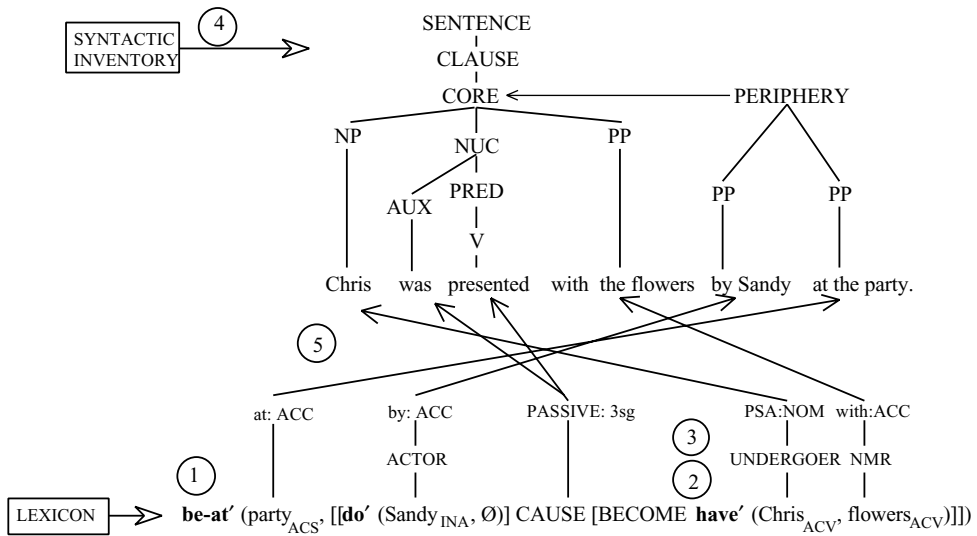


Figure 5.12 Passive voice linking of sentence in Figure 5.11

WH-questions have long been an important topic in syntactic theory, especially the kind found in English which involve a long-distance dependency. A phenomenon which all syntactic theories must account for is the case which may appear on a WH-word in the precore slot, as in, e.g., *Whom did Sandy present with the flowers at the party?* As Figure 5.13 shows, this follows without any further specifications from the RRG linking algorithm. It should be noted that simple WH-words like *who* and *what* have no activation level, since in the question they have no specific referent. WH-NPs like *which boy* would have one,

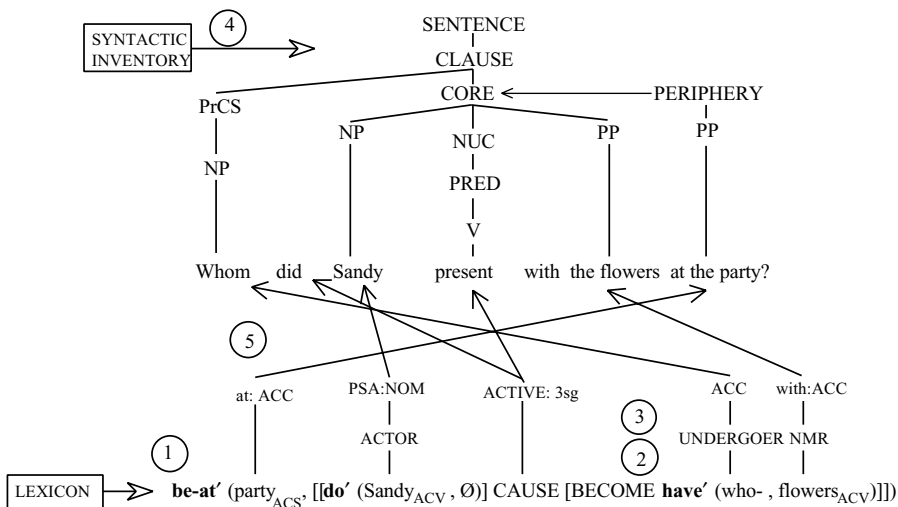


Figure 5.13 Linking in a WH-question in English

since they presuppose that some set of boys has been previously mentioned or is accessible; such WH-expressions have often been referred to as being ‘discourse linked’. Since the WH-word *who* is the undergoer of *present* in an active voice construction, it would be assigned accusative case (at least in the grammar of the speakers who have *whom*) in step (3), and then in step (5) it would be linked directly to the precore slot, following the constructional schema in Table 5.3. In a complete representation as in Figure 5.9, *did* would be represented in the operator projection as expressing past tense and interrogative illocutionary force (by virtue of its core-initial position).

English exhibits the rare phenomenon of preposition stranding in extraction constructions, e.g. *Who did Sandy present the flowers to at the party?*<sup>6</sup> The semantics-to-syntax linking algorithm proposed in Van Valin and LaPolla (1997) cannot account for preposition stranding, because it orders the preposition assignment rule after the linking the XPs into the syntactic representation. Since the preposition can be linked independently of its NP object, it must be assigned before the linking of the NP to the syntax occurs. Since many contemporary speakers of English do not have *whom* in their grammar, the only possible form of a WH-question in which the WH-word is the object of a preposition is the stranded form. The linking in *Who did Sandy present the flowers to at the party?* is given in Figure 5.14.

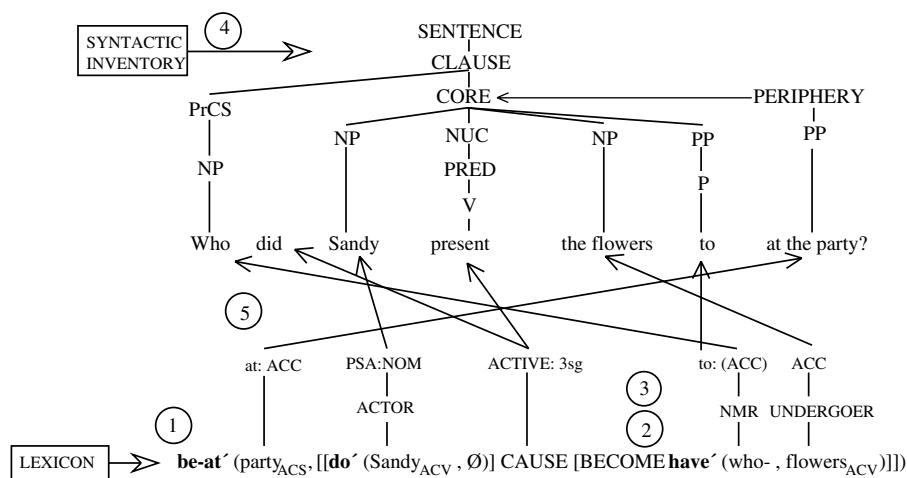


Figure 5.14 Linking in WH-question with preposition stranding in English

There are two distinctive attributes of this construction. First, the preposition links to the third argument position in the core, just as in Figure 5.10, but it lacks an object. This is not unprecedented in English, because there are intransitive prepositions that can fill core slots, e.g. *away* as in *He put the book away*. Second, this structure violates the template selection principle in (5.2b3); the latter permits

<sup>6</sup> See section 5.4.3 for a discussion of the discourse-pragmatic conditions on preposition stranding.

only *To whom did Sandy present the flowers at the party?*, since it requires that the core have one less argument slot to compensate for the occurrence of the argument XP in the precore slot. However, in an adjunct WH-question, e.g. *Where did Sandy present the flowers to Chris?*, there is a precore slot together with a full three-slot core, and accordingly this structure has a precedent in English syntax. Given the cross-linguistic rarity of this construction, this violation of (5.2b3) is normally not permitted by languages in which WH-words occur in the precore slot. The accusative case assigned by *to* is in parenthesis, since it is optional (and dispreferred) in this construction even for speakers who have *whom* in their grammar.

If the question were *Where did Sandy present Chris with the flowers?*, then the logical structure would be **be-L o c'** (where, [[**do'** (Sandy<sub>ACV</sub>, Ø)] CAUSE [BECOME **have'** (Chris<sub>ACV</sub>, flowers<sub>ACV</sub>)]]). The core internal linking would be the same as in Figure 5.11, and step 5b2 in (5.5) would assign the adjunct WH-word *where* to the precore slot.

It would be useful to illustrate the steps in (5.5) with respect to a language with a full case system, e.g. German. Consider the examples in (5.6); their semantic representation is given in (5.6d).

- (5.6) a. Der Mann ha-t der Frau den Hut geschenkt.  
 the.MsgNOM man have-3sgPRES the.FsgDAT woman the.MsgACC hat give.PSTP  
 'The man gave the hat to the woman [as a gift].'
- b. We-m ha-t der Mann den Hut geschenkt?  
 who-DAT have-3sgPRES the.MsgNOM man the.MsgACC hat give.PSTP  
 'To whom did the man give the hat?'
- c. Den Hut ha-t der Mann der Frau geschenkt.  
 the.MsgACC hat have-3sgPRES the.MsgNOM man the.FsgDAT woman give.PSTP  
 'The hat the man gave to the woman.'
- d.  $\langle_{\text{IF}} \text{DEC/INT} \langle_{\text{TNS}} \text{PRES} \langle_{\text{ASP}} \text{PERF} \langle_{\text{C}} [\text{do'} (\text{Mann}, \emptyset)] \text{ CAUSE [BECOME have'} (\text{Frau/we-}, \text{Hut})] \rangle \rangle \rangle \rangle$

The linking in (5.6b), which has a WH-word in the precore slot, is presented in Figure 5.15, while the linking in (5.6c), which has a non-WH NP in the precore slot, is given in Figure 5.16 on p. 144. The output of step (2), macrorole assignment, is always the same, as German does not allow variable linking to undergoer like English; hence *Hut* 'hat' is always the undergoer and *Frau* 'woman' or *we-* 'who' is always a non-macrorole core argument. In step (3) the actor is selected as privileged syntactic argument, yielding an active construction. The actor NP, *Mann* 'man', is the highest ranking core macrorole, and it therefore receives nominative case, and the finite verb would agree with it. The undergoer NP, *Hut* 'hat', is the other macrorole, and therefore it receives accusative case, while the non-macrorole core argument, *Frau* 'woman' or *we-* 'who', receives dative case. In both of these constructions, the NP in the precore slot is linked directly from its logical structure position to the precore slot, and no special considerations are required to account for its case.

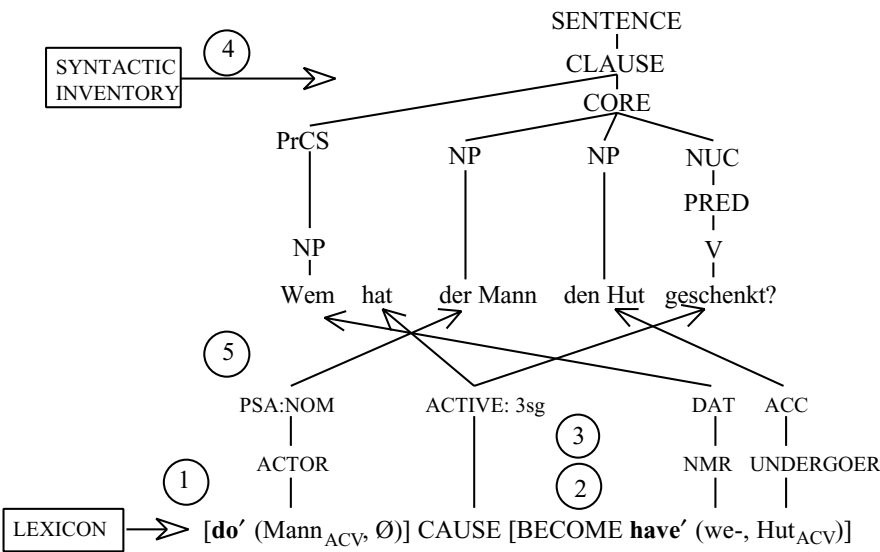


Figure 5.15 Linking from semantics to syntax in (5.6b) from German

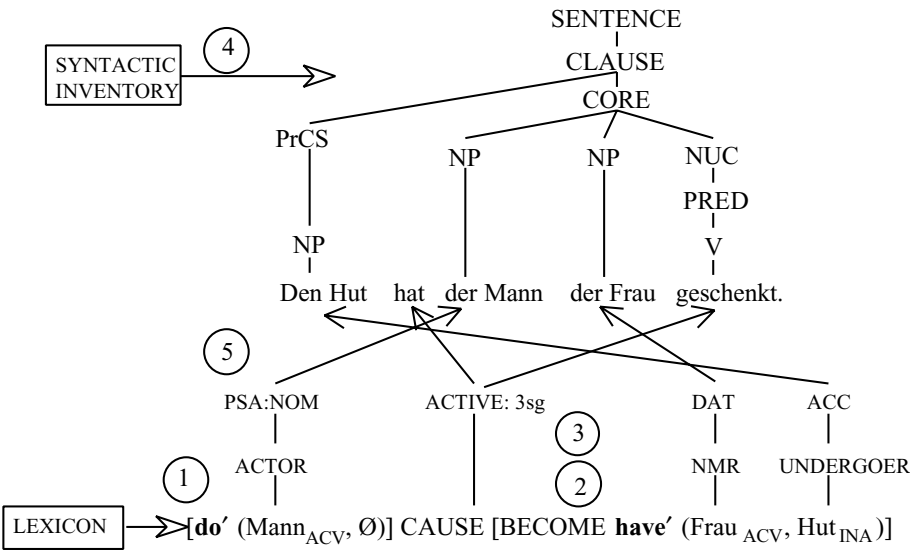
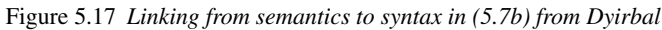


Figure 5.16 Linking from semantics to syntax in (5.6c) from German

Variable undergoer selection is unusual for languages with case systems, but Dyirbal exemplifies both an ergative syntactic system and variable undergoer selection, as discussed in section 4.4. In Dyirbal, as in English and German, the rightmost argument in the logical structure is the default choice for undergoer. The relevant examples are given in (5.7), repeated from (4.35).



- In Dyrbal the rules in (4.26) apply, assigning absolutive case to the undergoer, the lowest ranking macrorole, and ergative case to the actor *dugumbil* ‘woman’.<sup>7</sup> As in English, the choice of undergoer affects the coding of the third core argument. When the default selection is made, i.e. *miraŋ* ‘beans’ as undergoer, then the rule assigning dative case in (4.29b) applies, yielding (5.7a). When the marked selection is made, i.e. *yaŋa* ‘man’, then instrumental rather than dative case is assigned to the non-macrorole core argument, following the rule in (4.29a), yielding (5.7b). The pattern in (5.7b) is analogous to that in Figure 5.11. The linking in (5.7b) is illustrated in Figure 5.17.



(5.8) a. Seunang até lôn.  
happy liver 1sg  
'I am happy.' (lit: 'My liver is happy.')

b. Lôn seunang-até.  
1sg happy-liver  
'I am happy.'

<sup>7</sup> Dyrirbal has a person-based split case marking system; first and second person pronouns are subject to the rules in (4.25). See Van Valin and LaPolla (1997), section 7.3.1.2, for a discussion of split-ergative case systems.

The logical structure for both of these sentences is **be'** ([**have.as.part'** (1sg, até)], [**happy'**]), and they differ with respect to undergoer selection. In the unmarked linking in (5.8a), the logical structure is **be'** ([**have.as.part'** (lôn, até)], [**happy'**]), and *até lôn* 'my liver' is selected as undergoer and is linked to the postnuclear core position. In the marked linking in (5.8b), the logical structure is **be'** ([**have.as.part'** (lôn, até)], [**happy'**]), in which the possessor *lôn* is selected as head and hence as the undergoer. This is analogous to the alternation discussed in section 2.3 between *the woman's book* (**have'** (woman, book)) and *the woman with the book* (**have'** (woman, book)), in which either the possessed N (unmarked) or the possessor (marked) may be selected as the head of an NP expressing possession. The undergoer is linked to a core argument position, while the possessed body part is incorporated into the nucleus. These two linkings are illustrated in Figure 5.18.

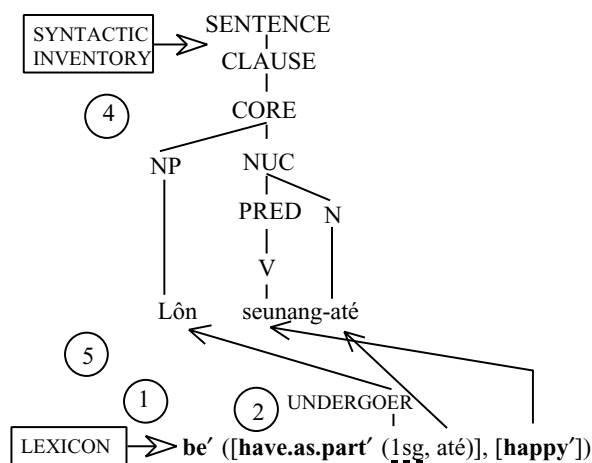
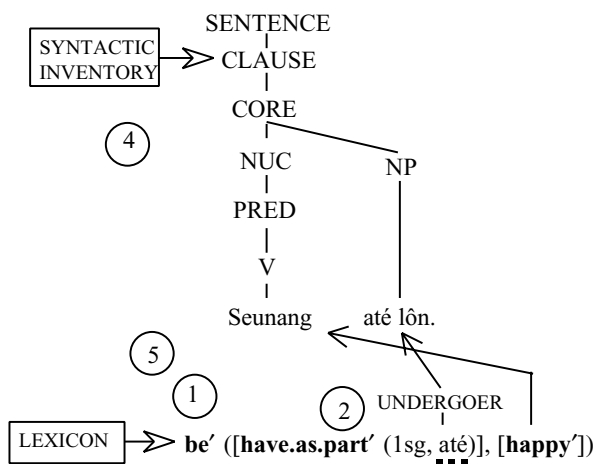


Figure 5.18 Linking from semantics to syntax in Acehnese possessor raising construction

Head-marking languages present an additional complication to step 5a in (5.5), because when there are independent NPs an argument is in effect coded twice, once as a pronominal affix on the verb and once as an independent NP. The following two Lakhota examples illustrate this issue.

- (5.9) a. Wičhá-wa-kte.  
 3plU-1sgA-kill  
 'I killed them.'
- b. Mathó ki wičhá-wa-kte.  
 bear the 3plU-1sgA-kill  
 'I killed the bears.'

In (5.9a), which has no independent NPs, the linking is straightforward, especially since Lakhota is an [S, A<sub>T</sub>] system and lacks a voice opposition. The linking in (5.9a) is given in Figure 5.19. The distinctive property of the clauses with one or more independent NPs is that both the independent NP and the bound argument marker on the verb fill the same argument position in the logical structure; in (5.9b) both *mathó ki* 'the bear' and *wičhá-* '3plU' instantiate a single argument and necessarily have the same reference. The bound pronoun, the obligatory part, is linked to its slot in the verb, while the NP is linked to a position inside the clause but outside of the core. This is shown in Figure 5.20 on p. 148.

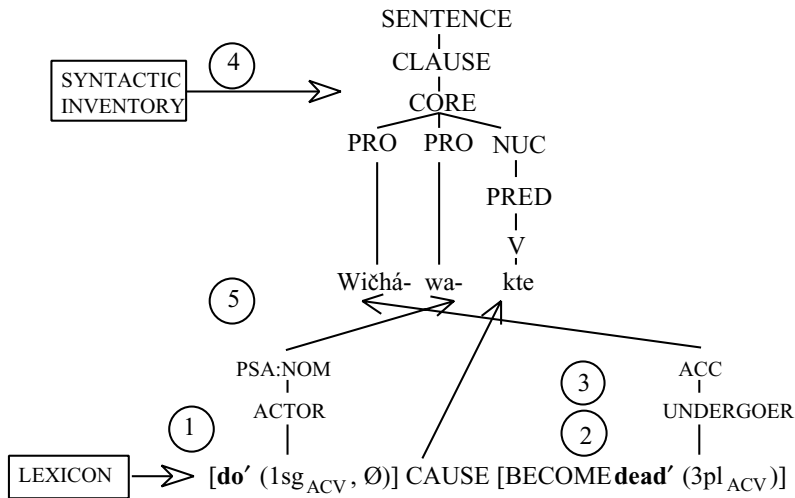


Figure 5.19 Linking from semantics to syntax in (5.9a) from Lakhota

In section 5.1.1, it was stated that constructional schemas play an important role in linking. The interaction of schemas was discussed with respect to the analysis of (5.4b'), which involves WH-question formation, antipassivization and reflexivization. This interaction can now be represented graphically, as in Figure 5.21 on p. 148. The schema for Sama WH-question formation in Table 5.4 specifies that (1) the WH-NP occurs in the precore slot, (2) the WH-NP must be the privileged syntactic argument in the clause, and (3) antipassive is required if the WH-NP does not function as the undergoer of the clause. Because the

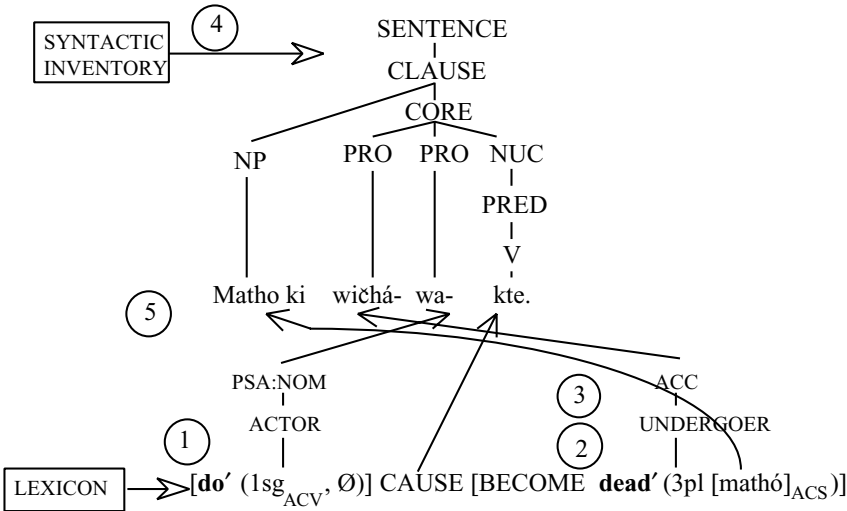
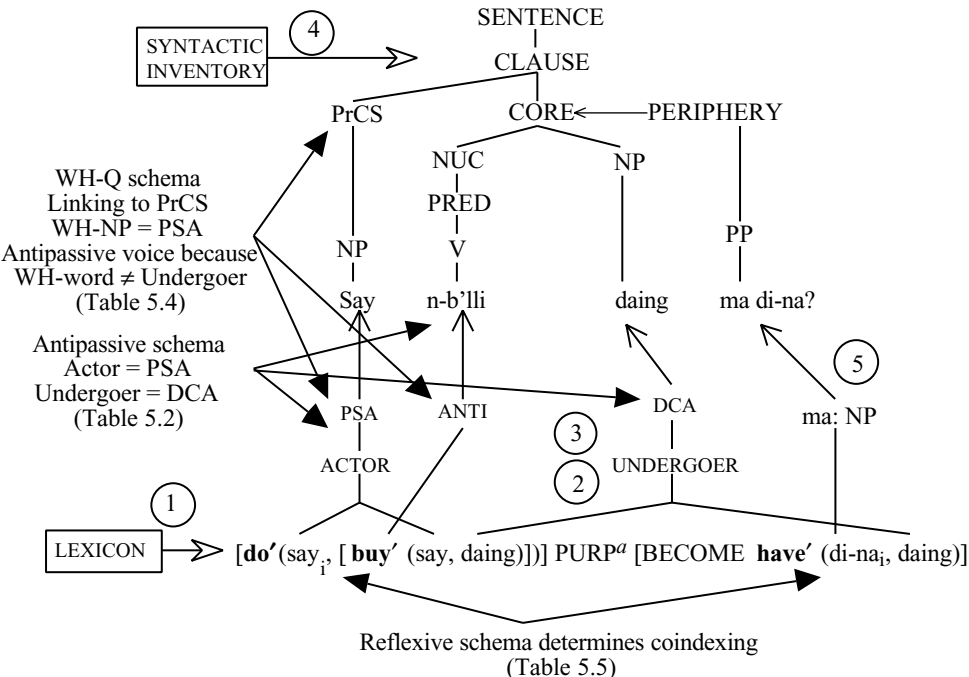


Figure 5.20 Linking from semantics to syntax in (5.9b) from Lakota



<sup>a</sup> 'PURP' is an abbreviation for the purposive logical structure, **want'** (x, LS<sub>2</sub>)  $\wedge$  DO (x, [[LS<sub>1</sub>  $\diamond$  CAUSE[LS<sub>2</sub>]]]. See Van Valin and LaPolla (1997: 382–4) for discussion.

Figure 5.21 Interaction of constructional schemas in the semantics-to-syntax linking in (5.4b')

WH-NP is in fact the actor, the antipassive schema in Table 5.2 is invoked. Finally, the reflexive binding is governed by the specifications in the schema in Table 5.5.

### 5.1.3 From syntax to semantics

Of the two directions of linking, going from the syntactic representation to the semantic representation is the more difficult, because it involves interpreting the overt morphosyntactic form of a sentence and deducing the semantic functions of the elements in the sentence from it. Accordingly, the linking rules must refer to the morphosyntactic features of the sentence. One of the main reasons there are so many steps in (5.10) is that it is intended to cover a significant cross-linguistic range of grammatical phenomena; the linking algorithm for any particular language will contain only those steps that are relevant to that language. The procedure for taking a sentence and linking it to its semantic representation is summarized in (5.10).

(5.10) Linking algorithm: syntax  $\rightarrow$  semantics

1. Determine the macrorole(s) and other core argument(s) in the clause.
  - a. If the verb is intransitive, then assign the privileged syntactic argument either macrorole or direct core argument status, depending upon the language (language-specific).
  - b. If the verb is transitive and the language lacks voice oppositions, determine the macroroles from case marking and/or word order (language-specific).
  - c. If the language has a voice opposition, determine the voice of a transitive verb (language-specific):
    1. If the construction is syntactically accusative:
      - a. If it is the unmarked voice, the privileged syntactic argument is actor.
      - b. If it is passive, the privileged syntactic argument is not the actor of the predicate in the nucleus;
        1. the actor may appear as a direct core argument (language-specific); or
        2. the actor may appear in the periphery<sub>CORE</sub> marked by an adposition or an oblique case (language-specific); or
        3. if there is no actor in the core or the periphery, then replace the variable representing the highest ranking argument in the logical structure with 'Ø'.
    2. If the construction is syntactically ergative:
      - a. If it is the unmarked voice, the privileged syntactic argument is undergoer.
      - b. If it is antipassive, the privileged syntactic argument is actor;
        1. the undergoer may appear as a direct core argument or as an oblique element (language-specific);

2. if there is no undergoer in the core or the periphery<sub>CORE</sub>, then replace the variable representing the lowest ranking argument in the logical structure with 'Ø'.
3. Assign macrorole status to the other direct core argument, if it is not dative or in an oblique case (language-specific).
- d. If the language is head-marking and there are independent NPs in the clause, associate each NP with a bound argument marker (language-specific).
2. Retrieve from the lexicon the logical structure of the predicate in the nucleus of the clause and with respect to it execute step 2 from (5.5), subject to the following proviso:
  - a. If the language allows variable undergoer selection and if there is more than one choice for undergoer, do not assign undergoer to an argument in the logical structure.
  - b. Determine the linking of the non-macrorole core argument:
    1. If there is a two-place state predicate in the logical structure and if the non-macrorole core argument is marked by a locative adposition or dative or a locative-type case, then link it with the first argument position in the state predicate in the logical structure and link the other non-actor core argument (if there is one) to the second argument position in the state predicate, or
    2. If there is a two-place state predicate in the logical structure and if the non-macrorole core argument is not marked by a locative adposition or dative or a locative-type case, then link it with the second argument position in the state predicate and link the other non-actor core argument (if there is one) to the first argument position in the state predicate.
    3. Otherwise, link the animate NP with the first argument position in the state predicate in the logical structure.<sup>8</sup>
3. Link the arguments determined in step 1 with the arguments determined in step 2 until all core arguments are linked.
4. If there is a predicative adpositional adjunct, then retrieve its logical structure from the lexicon, insert the logical structure of the core as the second argument in the logical structure and the object of the adposition in the periphery as the first argument.
5. If there is an element in the pre- or postcore slot (language-specific),
  - a. Assign it the remaining unlinked argument position in the semantic representation of the sentence.
  - b. And if there are no unlinked argument positions in the sentence, then treat the WH-word like a predicative preposition and follow the procedure in step 4, linking the WH-word to the first argument position in the logical structure.

The steps in 1c refer crucially to constructional schemas, especially in languages which have both syntactically ergative and syntactically accusative constructions.

<sup>8</sup> This handles sentences like (4.48a), in which there are two non-actor core arguments in the same case.

The application of this linking algorithm to English can be illustrated with a sentence like *Kim smashed the glass*. The first step is to identify the verb and its voice: *smashed* is transitive and active voice, which means that the privileged syntactic argument is the actor. The NP following the verb is direct, and therefore it must be the undergoer. Step 2 involves retrieving the logical structure of *smash* from the lexicon, [**do'** (x, Ø)] CAUSE [BECOME **smashed'** (y)], and assigning macroroles, yielding 'x = actor' and 'y = undergoer'. In step 3, the arguments from the sentence are linked to the logical structure arguments, yielding the result that 'x = *Kim*' and 'y = *the glass*'. This is illustrated in Figure 5.22.

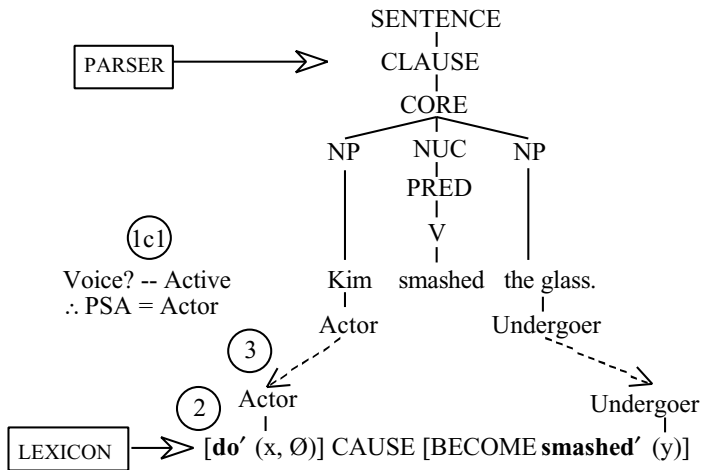


Figure 5.22 Linking from syntax to semantics in simple English transitive clause

In step 1, step (c) is required only in languages with voice oppositions. In [S, A<sub>T</sub>] languages this step would be unnecessary, and the linking from syntax to semantics in such languages is basically trivial: in a clause with a transitive verb, the privileged syntactic argument is always an actor and the other direct core argument is always the lower-ranking argument in terms of (4.14). The linking from syntax to semantics in Enga, a Papuan language of this type (Li and Lang 1979), is illustrated in Figure 5.23 for the example in (5.11).

- (5.11) Baa-mé mená dóko-Ø p-í-á.  
 3sg-ERG pig DET-ABS kill-PAST-3sg  
 'He killed the pig.'

The ergative case in Enga always marks the actor and the absolutive the undergoer. Hence the linking is simple and straightforward. The syntax-to-semantics linking algorithm for Enga would include only steps 1a–b, 2 (without a–b), 3 and 4 from (5.10); Enga has *in situ* WH-words, and therefore there is no need for step 5. This is the simplest possible syntax-to-semantics linking algorithm that a language could have, and that is perhaps one of the reasons why this language type is the most frequent cross-linguistically.

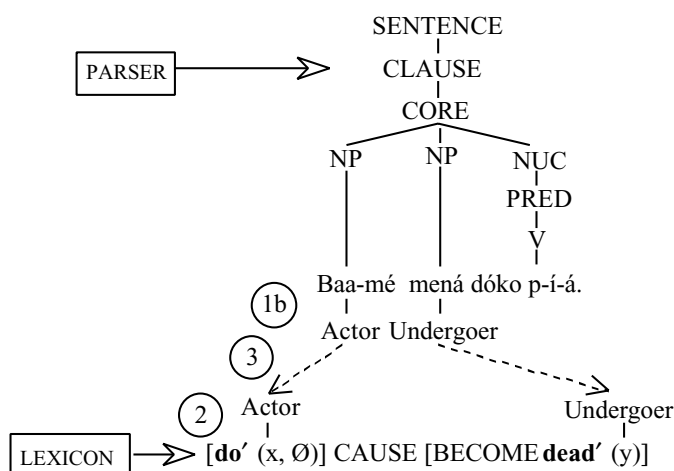


Figure 5.23 Linking from syntax to semantics in Enga sentence in (5.11)

Steps 2a,b are required only in languages like English and Dyirbal in which variable linking to undergoer is possible with a single verb and there is no indication on the verb, e.g. an applicative morpheme, that a marked linking has occurred. Consider the following examples of the locative alternation in German.

(5.12) German *laden/beladen* 'load'

- a. Max hat die Kiste-n auf den Lastwagen geladen.  
 have.3sgPRES the.FsgACC box-pl on the.MsgACC truck load.PSTP  
 'Max [actor] loaded the boxes [undergoer] on the truck.'
- a'. [do' (Max, [load' (Max, Kisten)])] CAUSE [BECOME **be-on'** (Lastwagen, Kisten)]
- b. Max hat den Lastwagen mit den Kiste-n beladen.  
 have.3sgPRES the.MsgACC truck with the.FsgDAT box-pl load.PSTP  
 'Max [actor] loaded the truck [undergoer] with the boxes.'
- b'. [do' (Max, [load' (Max, Kisten)])] CAUSE [BECOME **be-on'** (Lastwagen, Kisten)],  
 U = y

In the English translations of these two sentences, there are two different selections for undergoer, and there is no indication on the verb *load* as to whether an unmarked or a marked linking has occurred; the only clue is the preposition marking the oblique core argument. This is not the case in German, however: the verb *laden* 'load [on]' takes only the unmarked linking, i.e. the lowest ranking argument in the logical structure as undergoer, while the verb *beladen* 'load [with]' takes only the marked linking, i.e. the higher ranking non-actor argument. While these verbs would be related to each other in the lexicon via a lexical rule (cf. Van Valin and LaPolla (1997), section 4.6)), for linking purposes they count as distinct verbs, each of which takes only a single undergoer possibility. This would be indicated in the lexical entry for the verb lexicalizing the marked choice, i.e. 'U = y' for *beladen* 'load [with]'. Hence steps 2a,b would not apply to them, unlike their English counterpart.



The sentence in Figure 5.12, *Chris was presented with the flowers by Sandy at the party*, exemplifies three additional complications: passive voice, variable undergoer selection, and an adjunct locative PP. The first step is to determine the voice of the verb; it is passive voice, which means that the privileged syntactic argument is not the actor. The NP after the verb is oblique, marked by *with*, and the final NP is marked by *by*, which following 1c1b2 in (5.10) makes it the actor. The next step is to call up the logical structure for *present* from the lexicon, [do' (x, Ø)] CAUSE [BECOME have' (y, z)]. Step 2 from (5.5) is then carried out, with the result that  $x$  = the actor. Because there is more than one possible undergoer choice with this verb, undergoer cannot be assigned, following 2 in (5.10). Rather, by step 2b in (5.10), the role of the oblique core argument *the flowers* is deduced from its prepositional marker; since *with* is not a locative preposition, *the flowers* must be linked to the second argument position in a two-place state predicate. By step 3 the two actors may be linked; this leaves the non-actor MR in the clause and the  $y$  argument in the logical structure unassigned, and the two remaining arguments must be linked in order to satisfy the completeness constraint. The result is *Sandy* = actor =  $x$ , *Chris* = undergoer =  $y$ , and *the flowers* =  $z$ . There is additional unlinked material in the clause, namely the PP *at the party*. Step 4 in (5.10) comes into play here. The logical structure **be-at'** ( $x, y$ ) is retrieved from the lexicon; the logical structure of *present* serves as the second argument in the logical structure, and the NP *the party* functions as the first argument. This yields the logical structure **be-at'** (party, [[do' (Sandy, Ø)] CAUSE [BECOME have' (Chris, flowers)]]). This completes the linking, and it may be represented graphically as in Figure 5.24; the circled numbers refer to the steps in (5.10).

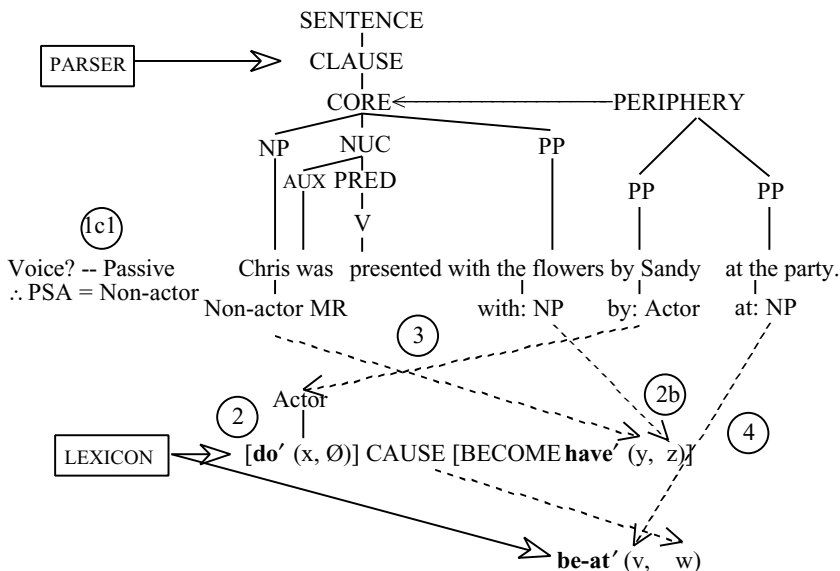


Figure 5.24 Linking from syntax to semantics in English passive construction



When a WH-question like (5.6b) is linked to its semantic representation, the WH-word is linked last after all of the core-internal arguments and the peripheral actor in a passive (if there is one) are dealt with. The WH-question to be analysed is *What did Sandy present to Chris?* An English WH-question will be analysed, because it is more challenging for the linking system; in languages like German with case-marked WH-words, the function of the WH-word is indicated by the case, whereas in English there is normally no indication of the function of the WH-word from its form.<sup>9</sup> Step 1 is to determine the voice of the verb; it is active, and therefore the privileged syntactic argument is the actor. Steps 2 and 2b would then come into play. Step 3 would involve associating actor with actor. After this has been accomplished, there remains an unlinked argument position in the logical structure of *present* and an unlinked NP in the precore slot. The only possibility that would avoid a violation of the completeness constraint would be to link the two, and accordingly step 5 is executed: the NP in the precore slot is linked to the remaining argument position in the logical structure. This linking is represented in Figure 5.26.

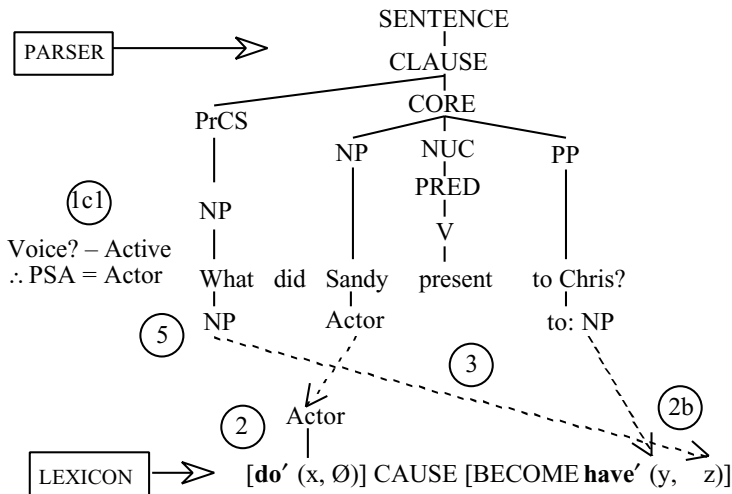


Figure 5.26 Linking from syntax to semantics in English WH-question

Preposition stranding presents an interesting problem for the linking algorithm. In a sentence like *Who did Sandy present the flowers to?*, the preposition *to* still serves as the crucial cue for determining the linking of the non-actor arguments in step 2b. This is shown in Figure 5.27. When step 2b is executed, the result is that the NP object of *to* should be linked to the first argument position in the two-place state predicate in the logical structure and the other non-actor core argument should be linked to the second argument position. However, there is

<sup>9</sup> The exceptions are the few speakers who use *whom* and for constructions in which the WH-word occurs with a preposition, as in *To which boy did she give the book?*, or as a possessor, e.g. *Whose book is on the table?*



In this example, *nathó ki* ‘the bear’ is third person and unmarked for number, while the two cross-reference markers on the verb are third plural animate and first singular. The independent NP is compatible only with *wičha-* ‘3plAnimate’, and therefore it is associated with it and thereby linked to an argument position in the logical structure. If the independent NP were compatible with both markers on a transitive verb, then the result would be an ambiguous sentence.

At the end of the previous section, the role of constructional schemas in semantics to syntax linking was illustrated, and they also play a role in syntax to semantics linking as well. In the linking from syntax to semantics in (5.4a'), the schemas for Sama WH-question formation and reflexivization are involved. Their interaction is illustrated in Figure 5.29. The interaction between the WH-question schema and step 1 of the linking algorithm yields the interpretation of the WH-NP as the undergoer, and the reflexive schema requires that the actor be coindexed with the reflexive anaphor.

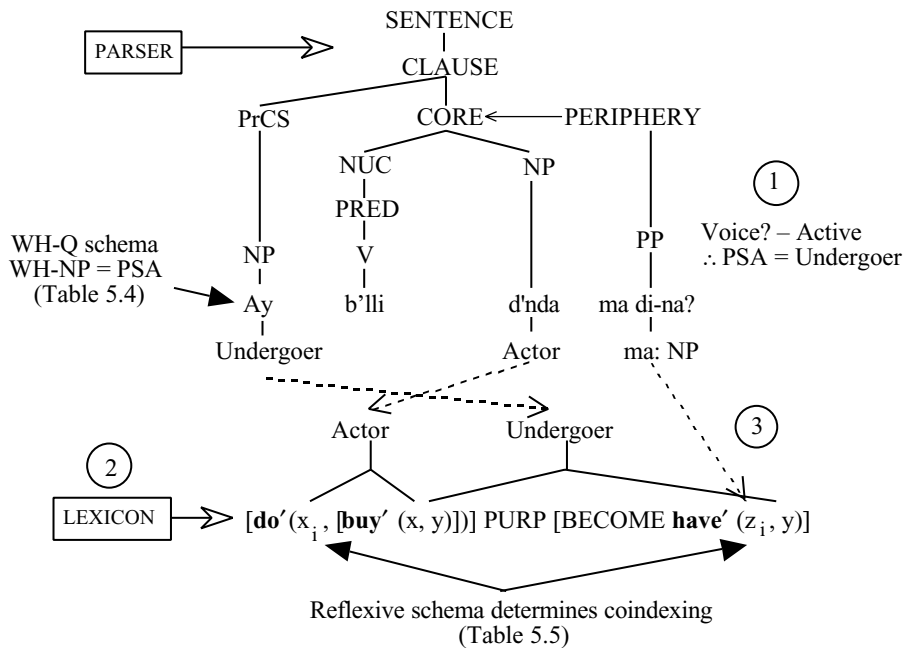


Figure 5.29 *Interaction of constructional schemas in the syntax to semantics linking in (5.4a')*

It must be emphasized that even though these linkings are described in terms of a sequence of steps, they are not equivalent to the stages in a transformational derivation, for two reasons. First, there is only one syntactic representation, the sentence itself, and one semantic representation, built around the logical structure of the predicate. Consequently, there are no derivationally related syntactic representations which are mapped into each other. Second, each step involves interpreting the structure in question, not manipulating or transforming it in any way. The argument positions in logical structure are assigned macrorole status (or not) with respect to the actor-undergoer hierarchy. The output of step 2 in (5.5) is

not a distinct level of representation but rather the accumulation of this semantic information about the arguments. *Sandy* in Figure 5.5 is the first argument of *do'* in the logical structure for *present*, and the result of step 2 is that this characterization is enriched to include the information that this argument is the actor, as Figure 5.6 clearly shows. Thus the representation of actor and undergoer in, e.g., Figure 5.10 is equivalent to an informationally enriched version of Figure 5.5, not a distinct level of semantic or syntactic representation.

## 5.2 The role of the lexicon in grammar

Since the 1970s most grammatical theorists have recognized a distinction between lexical and syntactic phenomena, starting from the criteria proposed in Wasow (1977). A prime example of a lexical phenomenon is the variable linkings to undergoer discussed in section 4.4 and elsewhere; they are subject to lexical variation, i.e. not all verbs which take three core arguments allow it (*put* does not, for example), they have semantic effects, and they involve semantic notions only, i.e. argument positions in logical structure and macroroles. The lexical rules discussed in section 2.1 affect the logical structure of a verb and therewith its argument structure. The best example of a syntactic phenomenon is the occurrence of WH-words in the precore slot in languages like English, Icelandic and Sama; in simple clauses, it is exceptionless and not subject to any kind of lexical variation; that is, it is always possible to form a WH-question, regardless of what the verb is, what the other core arguments are, etc. While the criteria for deciding the clear cases are generally agreed upon (e.g. lexical idiosyncrasies should be treated in the lexicon, processes which change the syntactic category of a lexical item should be in the lexicon, phenomena not or minimally subject to lexical government should be treated in the syntax), the criteria for distinguishing the two classes of phenomena are ultimately theory-internal.<sup>10</sup> In the framework being presented, the line between the two is clear-cut and falls out from the linking system in Figure 5.1: lexical phenomena affect the logical structure of the predicate, its argument structure, and actor and undergoer assignment (step 2 in (5.5)), whereas syntactic phenomena deal with the morphosyntactic realization of the macroroles and other core arguments (steps 3 and 5 in (5.5)).

<sup>10</sup> It is crucial to recognize the distinction between lexical and syntactic *phenomena*, on the one hand, and lexical and syntactic *rules*, on the other. These are independent distinctions, and the issue here is differentiating lexical from syntactic phenomena. At different points in the history of generative grammar, it has been argued that all grammatical phenomena, both lexical and syntactic, can or should be handled by the same kind of rule. In early generative grammar, when the only descriptive devices were phrase-structure rules and transformations, all phenomena, including word formation, were handled syntactically. Since the 1980s, theories have been proposed, e.g. LFG and HPSG, which attempt to handle all lexical phenomena and as many syntactic ones as possible by means of lexical rules.

This distinction is important because a lexical process can have very different grammatical consequences from a superficially similar syntactic process. Consider the following example from Japanese involving passivization and reflexivization. Japanese has two different passive constructions, which have often been called the ‘adversative passive’ and the ‘plain passive’.<sup>11</sup> The plain passive is much like passives in other languages; the undergoer appears as the privileged syntactic argument, and the actor is marked by the postposition *ni*. It is illustrated in (5.13).

- (5.13) a. Hanako ga yakuza o korosi-ta.  
           NOM gangster ACC kill-PAST  
           ‘Hanako killed the gangster.’  
       b. Yakuza wa Hanako ni koros-(r)are-ta.  
           gangster TOP DAT kill-PASS-PAST  
           ‘The gangster was killed by Hanako.’

The adversative passive differs from the plain passive in that its privileged syntactic argument is not a semantic argument of the verb. It is illustrated in (5.14).

- (5.14) a. Hanako ga nekom-da.  
           NOM become.bedridden-PAST  
           ‘Hanako became bedridden.’  
       a’. Taro wa Hanako ni nekom-(r)are-ta.  
           TOP DAT become.bedridden-PASS-PAST  
           ‘Taro was affected by Hanako’s becoming bedridden.’  
       b. Hanako ga odot-ta.  
           NOM dance-PAST  
           ‘Hanako danced.’  
       b’. Taro wa Hanako ni odor-are-ta.  
           TOP DAT dance-PASS-PAST  
           ‘Taro was affected by Hanako’s dancing.’

The so-called ‘passive agent’ is *Hanako ni* in (5.13b), (5.14a’) and (5.14b’). Reflexivization in Japanese involves the reflexive anaphor *zibun* ‘self’, and the antecedent of *zibun* must be a core argument (see section 5.3). In English, core arguments can antecede a reflexive pronoun, but peripheral adjuncts cannot; in particular, the actor in an adjunct *by*-PP in a passive construction cannot antecede a reflexive.

- (5.15) a. Sally talked to Harry about herself/himself.  
       b. Sandy gave the flowers to herself.  
       c. \*The flowers were given to herself by Sandy.  
       c’. \*The flowers were given by Sandy to herself.

<sup>11</sup> See Imai (1998) and Toratani (2002) for RRG analyses of these constructions.

Is the same true in Japanese? Interestingly, the answer is ‘yes’ for the plain passive but ‘no’ for the adversative passive, according to Kuno (1973).<sup>12</sup>

- (5.16) a. Yakuza wa Hanako ni zibun no uti de koros-(r)are-ta.  
 gangster TOP DAT self GEN house in kill-PASS-PAST  
 ‘The gangster<sub>i</sub> was killed by Hanako<sub>j</sub> in self<sub>i/\*j</sub>’s house.’
- b. Taro wa Hanako ni zibun no uti de nekom-(r)are-ta.  
 TOP DAT self GEN house in become.bedridden-PASS-PAST  
 ‘Taro<sub>i</sub> was affected by Hanako<sub>j</sub>’s becoming bedridden in self<sub>ij</sub>’s house.’
- c. Taro wa Hanako ni zibun no uti de odor-are-ta.  
 TOP DAT self GEN house in dance-PASS-PAST  
 ‘Taro<sub>i</sub> was affected by Hanako<sub>j</sub>’s dancing in self<sub>ij</sub>’s house.’

*Hanako ni* cannot be interpreted as the antecedent of *zibun* in (a), but it can in (b) and (c). Why should this be so? The answer is that *Hanako ni* is a peripheral adjunct, just like its English counterpart, in the plain passive construction in (a), whereas it is still a core argument in (b) and (c). In the prototypical passive construction discussed in chapter 4, the undergoer functions as the privileged syntactic argument and the actor is treated as a peripheral adjunct, if it appears at all. This involves the assignment of actor and undergoer to particular morphosyntactic statuses in step 3a in (5.5). Hence it is a syntactic phenomenon. What happens in the adversative passive is very different; the argument which would be the privileged syntactic argument in the normal form in (5.14a,b) is not coded as the appropriate macrorole (undergoer in (a), actor in (b)) but rather as a non-macrorole direct core argument. Because it is a core argument, it can serve as the antecedent for *zibun*, unlike the NP in the adjunct *ni*-PP in the plain passive. This situation is not unique to adversative passive constructions; it also occurs in causative constructions, as in (5.17).

- (5.17) a. Taro ga Hanako ni zibun no uti de hon o yom-(s)ase-ta.  
 NOM DAT self GEN house in book ACC read-CAUS-PAST  
 ‘Taro<sub>i</sub> made Hanako<sub>j</sub> read books in self<sub>ij</sub>’s house.’
- b. [**do**’ (x, Ø)] CAUSE [**do**’ (y, [**read**’ (y, z))]

Linking and case marking in causative constructions will be discussed in chapter 7. The logical structure for the core of (a) is given in (b). In terms of step 2 in (5.5), the *x* argument is the actor, and the *z* argument is the undergoer, following the actor–undergoer hierarchy. This leaves the *y* argument as a non-macrorole core argument, and it is marked by dative *ni*, following (4.29b). Significantly, both *x* and *y* arguments can serve as an antecedent for *zibun* in this construction, and the ability of the *y* argument to be an antecedent parallels that of *Hanako ni* in (5.16b). Here it is clear that this is a lexical process, since it involves the assignment of arguments in logical structure to macroroles, not macroroles to

<sup>12</sup> Native speakers seem to agree that plain passive agents cannot control a reflexive, but they differ with respect to their judgments regarding adversative passives. In particular, while they all agreed that some examples are grammatical, they often disagreed as to which ones are grammatical. The ones presented here were acceptable to all of the speakers who were consulted.



syntactic functions as in the plain passive construction. Thus, by recognizing the distinction between the non-canonical assignment of the effector of *yomu* 'read', the patient of *nekomu* 'become bedridden', and the effector of *odoru* 'dance' as non-macrorole core arguments in the causative and adversative passive constructions and the non-canonical syntactic assignment of actor and undergoer in the plain passive construction, it is possible to explain the differential behaviour of the NPs in the *ni*-PPs with respect to reflexivization.

The existence of operations on logical structure, be they lexical rules, as in (2.18) relating activity to active accomplishment verbs, or a lexical voice operation like the Japanese adversative passive, raises questions about the structure of the lexicon and how it functions in the grammar. The lexicon is normally thought of as a storehouse of lexical items, words and morphemes, and the phenomena discussed in this section are not about storing lexical forms but manipulating them to create new ones. Also, the semantic representations of sentences are constructed out of material stored in the lexicon, as noted at the beginning of section 5.1. Accordingly, it is necessary to think of the lexicon as having at least two parts, one the traditional storehouse of words and morphemes, and the second a 'workshop' where lexical rules and other lexical processes can create new lexical forms which would not otherwise be stored. This is also the area where the semantic representation of a sentence would be composed, based on the logical structure of the predicing element.

### 5.3 Reflexivization

In Van Valin and LaPolla (1997) three different types of reflexive constructions were discussed: lexical reflexives of the type found in Lakhota and Dyirbal, clitic reflexives of the type found in Romance and Slavic languages, and coreference reflexives of the type found in English and Icelandic. In this section only coreference reflexives will be discussed; see Van Valin and LaPolla (1997: sections 7.5.1, 7.5.3), for discussion of the other types.

Many languages have coreference reflexive constructions, in which the antecedent and the reflexive pronominal are independent syntactic arguments, with the reflexive element interpreted as obligatorily referring to the antecedent (controller). In a simple example like *Sally saw herself*, the logical structure is *see'* (Sally, herself), and the linking is trivial. This simplicity masks a host of important questions, the primary ones stated in (5.18).

- (5.18) a. What is the hierarchical relationship between the controller (antecedent) and the reflexive pronoun? Is it best characterized syntactically or semantically?
- b. In what syntactic domain must the controller and reflexive pronoun co-occur?

The first question refers to the problem of determining the range of possible relationships that the antecedent can bear to the reflexive. Why is *\*Herself saw*

*Sally* ungrammatical? Why is *\*Sally's brother saw herself* also ungrammatical? With respect to the second question, it is widely assumed that in English the clause is the syntactic domain in which reflexivization occurs, but it is necessary to distinguish the domain of possible reflexivization from the domain of obligatory reflexivization. In English, the clause is the domain of possible reflexivization but not the domain of obligatory reflexivization, as the following examples show.

- (5.19) a. The woman<sub>i</sub> sent the book to herself<sub>i</sub>/*\*her*<sub>i</sub>.  
 b. Nancy<sub>i</sub> saw a rat near her<sub>i</sub>/*\*herself*<sub>i</sub>.  
 c. Sally<sub>i</sub> got some Alfredo sauce on her<sub>i</sub>/herself<sub>i</sub>.

All of these are simple sentences, and yet reflexivization is obligatory in (a), impossible in (b), and apparently optional in (c). What is the nature of the contrast here? Is it syntactic or semantic?

The RRG approach to the first question is based largely on Jackendoff's (1972, 1992) work on reflexivization; he employs a somewhat different system of semantic representation, and accordingly his principles will have to be adapted to apply to the representations presented in chapter 2. In the earlier work he proposed a thematic-relations-based constraint on reflexivization: the antecedent must be higher on the thematic relations hierarchy than the reflexive. The hierarchy he assumed was agent > location, source, goal > theme. The relevant hierarchy in RRG is the privileged syntactic argument selection hierarchy in (4.14) and associated principles in (4.15). Jackendoff's semantic hierarchy constraint on reflexivization may be reformulated as in (5.20).

- (5.20) Role hierarchy condition on reflexivization:  
 the reflexive pronoun must not be higher on (4.14) (as applied to selection of privileged syntactic arguments in the language in (4.15c,d)) than its antecedent.

For English, this means that actors and undergoers are possible controllers, but it also means that non-macrorole core arguments, both direct and oblique, can be controllers as well. Hence the hierarchy for English is actor > undergoer > other.

The role hierarchy condition in (5.20) is universal, in that the reflexive is never higher on the hierarchy than the antecedent; in other words, actors are always the antecedents for undergoers, never the other way around. The phrase in (5.20) 'as applied to the selection of privileged syntactic arguments in the language' refers exclusively to whether selection of the privileged syntactic argument is restricted to macroroles only or not, or to direct core arguments only or not. In terms of what 'higher on (4.14)' means, it is the same for coreference reflexives in both syntactically ergative and syntactically accusative languages (cf. (5.4)).

The operation of this principle in English can be illustrated with the simple examples introduced above, repeated in (5.21) with their logical structures.

- (5.21) a. Sally saw herself.  
       a'. **see'** (Sally<sub>i</sub>, herself<sub>i</sub>)  
       b. \*Herself saw Sally.  
       b'. **see'** (herself<sub>i</sub>, Sally<sub>i</sub>)  
       c. \*Sally's brother saw herself.  
       c'. **see'** ([**have.as.kin'** (Sally<sub>i</sub>, brother)], herself<sub>i</sub>)

In (a) *Sally* is the actor and *herself* the undergoer, and the sentence is fine. In (b), on the other hand, *herself* is the actor and *Sally* the undergoer, which violates the condition in (5.20). In (c), *Sally* is neither actor nor undergoer; indeed, it is not an argument of *see* at all. Hence it is not a possible antecedent for *herself*. It would appear that there is an important unstated assumption in (5.20), namely, that both the antecedent and the reflexive must be semantic arguments of the verb. While this seems to work for (5.19a,b) and the examples in (5.21), it is too strong; in (5.19c), *herself* is not a semantic argument of *get* but rather an argument adjunct, and yet the sentence is clearly grammatical. This aspect of the relationship between the reflexive and its antecedent will be further clarified below.

Pollard and Sag (1992) present examples like those in (5.22) as counterexamples to Jackendoff's (1972) thematic hierarchy condition and as problems for any thematic-relations-based theory of reflexivization.

- (5.22) a. I pointed out Nancy to herself in the picture.  
       b. I showed Nancy herself in the picture.

In (a) *Nancy* is theme and *herself* goal, in Jackendoff's terms, whereas in (b) *Nancy* is goal and *herself* theme. Recall that Jackendoff's hierarchy is agent > location, source, goal > theme, and while this predicts the grammaticality of (b), it incorrectly predicts the ungrammaticality of (a). It looks as if, in Jackendoff's terms, the hierarchy is different for different constructions, an unhappy result. But in terms of the actor > undergoer > other hierarchy there is no problem, for in both sentences the undergoer is the antecedent and the reflexive is a non-macrorole core argument, which counts as 'other'. Thus, English reflexivization is governed by the formulation in (5.20), not the thematic relations hierarchy proposed by Jackendoff.

Does the role hierarchy condition make any predictions that a purely syntactic analysis, e.g. principle A stated in terms of c-command (Chomsky 1981), does not? Consider the following examples from Toba Batak (Sugamoto 1984), a VOS language; the examples in (5.23) illustrate the voice system, while those in (5.24) exemplify the basic facts of reflexivization.

- (5.23) a. Mang-ida si Ria si Torus.  
           ATV-see PM PM  
           'Torus sees Ria.'

- b. Di-ida si Torus si Ria.  
PASS-see  
'Ria is seen by Torus.'
- c. Mang-ida si Torus si Ria  
ATV-see  
'Ria sees Torus.'
- d. Di-ida si Ria si Torus.  
PASS-see  
'Torus is seen by Ria.'

Active voice is shown in (5.23a,c), in which the NP immediately following the verb is the undergoer and the final NP is the actor. In the passive voice in (b,d), the actor remains a direct core argument and immediately follows the verb, while the undergoer is in final position.<sup>13</sup> Toba Batak is like Sama in that the actor is the reflexive controller, as the following examples demonstrate.

- (5.24) a. Mang-ida diri-na si Torus.  
ATV-see self-3sgGEN Actor binds undergoer  
'Torus sees himself.'
- b. Di-ida si Torus diri-na.  
PASS-see self-3sgGEN Actor binds undergoer  
'Himself is seen by Torus.'
- c. \*Mang-ida si Torus diri-na.  
ATV-see self-3sgGEN \*Undergoer binds actor  
'Himself sees Torus.'
- d. \*Di-ida diri-na si Torus.  
PASS-see self-3sgGEN \*Undergoer binds actor  
'Torus is seen by himself.'

In terms of X-bar syntax, the 'subject', the final NP, c-commands the post-verbal NP, and principle A predicts that (5.24a,d) should be grammatical and (b,c) should be ungrammatical. This is not the case, however. While (5.24a) is grammatical and (c) ungrammatical, as predicted, (5.24b) is grammatical and, perhaps even more surprisingly, (d) is ungrammatical. The role hierarchy condition, on the other hand, correctly predicts the grammaticality of these four examples: when the actor binds the undergoer, the sentence is grammatical, as in (5.24a,b), and when the undergoer binds the actor, as in (c,d), the sentence is ungrammatical. Thus, the semantic condition in (5.20) correctly predicts the facts of Toba Batak reflexivization, while the c-command-based principle does not.

While this section is concerned with reflexives and not reciprocals, the semantic approach highlights an important difference between them. Consider the examples in (5.25).

<sup>13</sup> This is an example of a voice opposition with PSA modulation only, since the actor remains a direct core argument.

- (5.25) a. \*The men were shaved by themselves.  
 b. The men were shaved by each other.

Example (5.25a) is the passive of a sentence like (5.21b), and it clearly violates the role hierarchy condition in (5.20). But (5.25b), which is structurally identical to (5.25a), is grammatical. What explains the difference in grammaticality between the two examples? The explanation lies in the different semantics of the two forms. Rough logical structure representations of the meanings of (5.25a,b) are given in (5.26a,b).

- (5.26) a.  $\text{do}'(\text{men}_i, [\text{shave}'(\text{men}_i, \text{men}_j)]), i = j$   
 b.  $\text{do}'(\text{man}_i, [\text{shave}'(\text{man}_i, \text{man}_j)]) \wedge \text{do}'(\text{man}_j, [\text{shave}'(\text{man}_j, \text{man}_i)])$

In (5.25a) there are multiple men, and each one's activity can be described by (5.26a); in (5.25a) *themselves* is  $\text{men}_i$ , the actor, and *the men* is  $\text{men}_j$ , the undergoer, and consequently this sentence violates the role hierarchy condition. The situation is interestingly different in (5.26b); there could be multiple pairs of  $\text{man}_i$  and  $\text{man}_j$ , but this does not affect the analysis. If the same assignments were made in the first part of (5.26b), then *each other* is  $\text{man}_i$ , the actor, and *the men* is  $\text{man}_j$ , the undergoer, which, like (5.26a), would violate the role hierarchy condition. But the second part does not violate it; there *the men* is  $\text{man}_j$ , the actor, and *each other* is  $\text{man}_i$ , the undergoer.<sup>14</sup> Hence *the men* includes both  $\text{man}_i$  and  $\text{man}_j$ , which means that semantically it is both actor and undergoer, and likewise *each other* includes both  $\text{man}_i$  and  $\text{man}_j$ , which means that it too is both actor and undergoer semantically. The role hierarchy condition states that the reflexive or (in this case) reciprocal 'must not be higher on (4.14) . . . than its antecedent', and because both *the men* and *each other* are both actor and undergoer simultaneously, this condition is not violated, since *each other* is not higher on the hierarchy than *the men*, as the representations in (5.26b) make clear. Thus, the semantic approach to binding based on (5.20) can explain the difference between (5.25a) and (b).

Jackendoff's second condition, presented in his 1992 paper, offers an alternative way of explaining the ungrammaticality of (5.21c). Since the system of semantic representation he employs differs from the one in RRG, the condition will be reformulated in terms of logical structures. The heads of the fillers of the variable positions in logical structure will be termed the *primary arguments* of the logical structure. In a simple logical structure like (5.21a'), both *Sally* and *herself* are primary arguments. In (c'), however, *brother* and *herself* are the primary arguments; *Sally* is not a primary argument, since *brother* is the head of the complex expression filling the *x* argument position in the logical structure. Jackendoff defines a notion which will be called *logical structure superiority* (or *LS-superiority*) as in (5.27a).

<sup>14</sup> It should be noted that there are languages which express reciprocals in exactly this way, i.e. with two cores with the actor of the first being the undergoer of the second, and the undergoer of the first core being the actor of the second, e.g. Amele (J. Roberts 1987).

- (5.27) a. Logical structure superiority (LS-superiority)  
 A constituent P in logical structure is LS-superior to a constituent Q  
 iff there is a constituent R in logical structure such that  
 i. Q is a constituent of R, and  
 ii. P and R are primary arguments of the same logical structure.
- b. Superiority condition on reflexivization:  
 a bound variable may not be LS-superior to its binder.

In (5.21c') *Sally* is a non-head constituent of **have.as.kin'** (*Sally*, brother), and therefore *herself* is LS-superior to *Sally*, since *herself* is a primary argument of the logical structure. Jackendoff proposes the condition on reflexivization given in (5.27b). That is, a reflexive pronoun may not be LS-superior to its antecedent in logical structure. This condition rules out (5.21c) but not (b), while the principle in (5.20) rules out (b) but not (c). Thus both principles are needed to account for the examples in (5.21a–c).

Are two semantic principles, (5.20) and (5.27b), really necessary here? The answer is 'yes'. Consider the contrast between German and Icelandic with respect to the equivalents of 'she was told a story about herself' in the two languages. The sentences are given in (5.28a,b).

- |           |                                       |               |                  |              |       |        |           |
|-----------|---------------------------------------|---------------|------------------|--------------|-------|--------|-----------|
| (5.28) a. | Henni                                 | var           | sögd             | sag-a        | um    | sig.   | Icelandic |
|           | 3FsgDAT                               | be.PAST.IMPER | tell.PSTP.FsgNOM | story-FsgNOM | about | SELF   |           |
|           | 'She was told a story about herself.' |               |                  |              |       |        |           |
| b.        | *Ihr                                  | wurde         | eine             | Geschichte   | über  | sich   | German    |
|           | 3FsgDAT                               | become.IMPER  | a.FsgNOM         | story        | about | 3.SELF |           |
|           | 'She was told a story about herself.' |               |                  |              |       |        |           |

Both sentences would have the same logical structure, and it meets the LS-superiority condition, as the antecedent *she* (a primary argument) is LS-superior to the reflexive *herself*, which is not a primary argument since it is inside the NP 'a story about X'. The LS-superiority condition cannot, therefore, account for the ungrammaticality of the German example. That is explained by the difference in the role hierarchy condition in the two languages. German allows only macrorole arguments as privileged syntactic arguments, and therefore only macrorole arguments are possible controllers for reflexives. Hence *ihr* '3FsgDAT', being a non-macrorole direct core argument, is not a possible antecedent for a reflexive, and consequently the sentence is ungrammatical. In Icelandic, on the other hand, the hierarchy in (4.14) applies to direct core arguments, and therefore the possibility of controlling a reflexive is not restricted to macroroles. Hence *henni* '3FsgDAT' is a possible antecedent, and because the reflexive is not higher on the hierarchy than its controller, the sentence is grammatical. Thus, the contrast in grammaticality between the German and Icelandic examples in (5.28) cannot be explained by the LS-superiority condition alone; rather, both principles are needed to explain this contrast.

The privileged syntactic argument selection principles in English include macrorole and non-macrorole core arguments, and, as mentioned above, this

entails that both types of syntactic arguments can serve as reflexive controllers. This may be summarized as ‘actor > undergoer > other’, and if both the controller and the reflexive fall into the ‘other’ category, then (4.14) applies to them directly. An example of an undergoer controller in English is a sentence like *Mary told Lloyd about himself*, where the undergoer *Lloyd* is the antecedent. When both actor and undergoer are potential antecedents, as in *Mary told Susan about herself*, the actor is always a possible antecedent, and for many speakers both are. It is also possible to have a non-macrorole argument as an antecedent, as in *Bob talked to Susan about herself*. In this sentence, *Susan* outranks *herself* on the privileged syntactic argument selection hierarchy. Hence this sentence meets both conditions governing reflexivization in English.

At the beginning of this section the question of the syntactic domain in which reflexivization occurs in English was raised. It is usually assumed that the clause is the domain of reflexivization in English, but the examples in (5.19), repeated below, show that while the clause appears to be the domain of possible reflexivization in English, it is not the domain of obligatory reflexivization.

- (5.19) a. The woman<sub>i</sub> sent the book to herself<sub>i</sub>/\*her<sub>i</sub>.  
 b. Nancy<sub>i</sub> saw a rat near her<sub>i</sub>/\*herself<sub>i</sub>.  
 c. Sally<sub>i</sub> got some Alfredo sauce on her<sub>i</sub>/herself<sub>i</sub>.

If the clause were the domain of obligatory reflexivization, then all three sentences should have reflexive pronouns. There is a domain of obligatory reflexivization, as (a) shows; what is it? First, the domain of possible reflexivization in English appears to be the *core*, not the clause, in simple sentences. All of these PPs are within the core. Second, reflexivization is obligatory among semantic co-arguments within the core; crucially, it is not obligatory when the corefering element is in an argument-adjunct PP. In both (5.19b) and (c) the PPs are argument-adjuncts, whereas in (a) it is an argument PP, and reflexivization is obligatory in (a) and only optional in (c). However, there are sentences like *Who injured herself?* which show that this constraint is too strong. In this sentence, the controller is a syntactic argument in the precore slot, which is outside of the core. Hence it must be the clause, not the core, as the proper domain. This may be formulated as the ‘domain of obligatory reflexivization constraint’, stated in (5.29).

- (5.29) Domain of obligatory reflexivization constraint:  
 Within a simple clause, one of two corefering NPs which are semantic co-arguments must be realized as a reflexive, while one of two corefering NPs which are not semantic co-arguments may be realized as a reflexive.

‘Semantic co-arguments’ are semantic arguments of the same logical structure. ‘Within a simple clause’ means a clause that contains a single core and possibly a precore slot; the situation is rather different in clauses composed of multiple cores, as will be shown in chapter 7. ‘Two corefering NPs which are not semantic co-arguments’ are NPs within the same simple clause which are not semantic arguments of the same logical structure; this is the case with the NP in

argument-adjunct PPs, as it is the semantic argument of a predicative preposition and not directly a semantic argument of the logical structure of the verb. This constraint, combined with the role hierarchy and LS-superiority conditions, provides an explanation for the examples in (5.19); the logical structures in (5.30) are for the examples in (5.19).

- (5.30) a. [do' (woman<sub>i</sub>, Ø)] CAUSE [BECOME have' (herself<sub>i</sub>, book)]  
 a'. [do' (woman<sub>i</sub>, Ø)] CAUSE [BECOME have' (her<sub>\*i/j</sub>, book)]  
 b. see' (Nancy<sub>i</sub>, [be-near' (her<sub>i</sub>/\*herself<sub>i</sub>, rat)])  
 c. [do' (Sally<sub>i</sub>, Ø)] CAUSE [BECOME be-on' (her<sub>i</sub>/herself<sub>i</sub>, Alfredo sauce)]

The logical structure in (5.30a) meets all three conditions: *woman* and *herself* are arguments of the same logical structure, *woman* (actor) is higher on the role hierarchy than *herself* (either undergoer or other, depending on the linking), and *herself* is not LS-superior to *woman*. In the logical structure in (a'), on the other hand, the domain of obligatory reflexivization constraint is violated, if the pronoun *her* is coindexed with *woman*, since they are semantic co-arguments. In both the (b) and (c) logical structures, the coreferential NP functions as an argument-adjunct in the core, not as a semantic co-argument, because it is the object of a predicative preposition. In (5.30b) the predicative preposition **be-near'** expresses the location of the rat and is unrelated to the main verb *see*. The verb *get* in (c) has the same type of logical structure as verbs like *put*, i.e. [do' (x, Ø)] CAUSE [BECOME **be-LOC'** (y, z)], and because a number of different locative prepositions can occur in the **be-LOC'** slot in the logical structure, each adding its semantics to the clause (cf. (1.14)), the prepositions are predicative and their objects are argument-adjuncts. Hence *Sally* and *her/herself* in (c) are not semantic co-arguments. Consequently, the condition for optional reflexivization in (5.29) is met, and therefore in principle either a pronoun or a reflexive is possible; the other two conditions are also met.

Why is the reflexive possible with (c) but not with (b) in (5.30)? Kuno (1987) suggests the difference lies in the degree of affectedness of the argument; the more affected the argument, the more acceptable the reflexive form is. The actor of *see* in (5.30b) is not affected by seeing something. On the other hand, Sally is affected by getting Alfredo sauce on her clothes or body, and the choice of the plain form or the reflexive reflects the speaker's assessment of how affected she is. If the sentence is changed to *Sally got some Alfredo sauce all over herself/her*, the *all over* signals greater affectedness, and *herself* becomes the preferred form for many speakers. Argument-adjunct PPs are within the core, hence within the domain of possible reflexivization, and if the NP head of the PP is highly affected by the action of the verb, a reflexive may be used if the conditions in (5.20), (5.27) and (5.29) are met. The constructional schema for English reflexivization is presented in Table 5.6.

There is one more important example to be analysed; it is given in (5.31).

- (5.31) \*Herself was seen by Sally.



Table 5.6 *Constructional schema for English reflexivization*

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CONSTRUCTION: English reflexivization

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## SYNTAX:

Template(s): (5.2)

PSA: Semantic controller = actor &gt; undergoer &gt; other

Linking: Controller = core argument

Domain: simple clause [PrCS + core]

If controller and coreferential NP are semantic co-arguments, reflexivization is obligatory.

If controller and coreferential NP are not semantic co-arguments, reflexivization is optional.

## MORPHOLOGY:

Reflexive: non-nominative pronoun + *self*

## SEMANTICS:

Controller and reflexive pronoun are obligatorily coreferential within the clause

Subject to role hierarchy and LS-superiority conditions

## PRAGMATICS:

Illocutionary force: unspecified

Focus structure: unspecified

---

The first thing to note about this sentence is that it has the same logical structure as *Sally saw herself* in (5.21a), i.e. **see'** (Sally, herself), and therefore it meets the conditions in (5.20) and (5.27). It might be suggested that this is ungrammatical because 'backwards reflexivization' is impossible, but this explanation is incorrect, as the sentences in (5.32) show.

- (5.32) a. Sally bought nothing for herself.  
       a'. For **HERSELF** Sally bought nothing.  
       b. Jim likes himself; he can't stand other people.  
       b'. **HIMSELF** Jim likes; it's **OTHER PEOPLE** he can't stand.

Small caps signal narrow (in this case, contrastive) focus in (5.32a', b'). Both (a') and (b') involve backwards reflexivization, and yet both are grammatical. Hence the ungrammaticality of (5.31) cannot be explained in terms of the impossibility of backwards reflexivization. As in the (a) and (b) examples, both (a') and (b') meet the conditions in (5.20) and (5.27). The problem in (5.31) is the controller is an adjunct. Reflexivization in English has a semantic controller for a privileged syntactic argument, and privileged syntactic arguments, regardless of whether they are syntactic or semantic in nature, must be syntactic arguments and cannot be adjuncts. This is stated in the constructional templates for reflexivization in both Sama and English. This can be construed as a kind of domain constraint: within the syntactic domain of reflexivization, the controller must be in either the precore slot or the core; it cannot be in the periphery<sub>CORE</sub>. This means that the role hierarchy and LS-superiority conditions apply to the output of step 3 of the



syntactic inventory. Where does the focus structure projection come from? In some instances, it may be stored with particular syntactic templates which are necessarily associated with specific focus structures; for example, WH-questions always have narrow focus on the WH-XP in the precore slot, and locative inversion structures (e.g. *Into the room ran a mouse*) are always sentence focus. The templates for these structures would have a focus structure projection associated with them in the syntactic inventory. These templates are given in Figure 5.31.

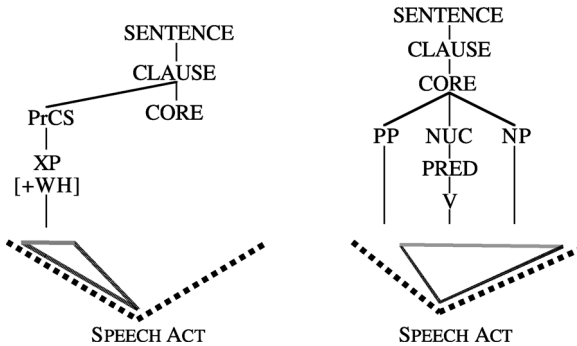


Figure 5.31 Syntactic templates for English WH-question and locative inversion constructions

For pragmatically unspecialized templates, e.g. NP V NP or NP V NP PP, this would be implausible. And even if there were multiple, say, NP V NP templates, each with a possible focus structure projection, there would have to be some sort of selection criterion to ensure the correct selection relative to the discourse context. The potential focus domain is a property of the grammar as a whole, and it could be represented on simple clause templates. The issue is the derivation of the actual focus domain, which is context-dependent.

In section 3.1 above, Lambrecht's (1994) definition of 'focus' is 'the semantic component of a pragmatically structured proposition whereby the assertion differs from the presupposition'. This yields the actual focus domain, and, in order to derive it, it is necessary to have representations of both the pragmatic assertion and the pragmatic presupposition. This can be done in terms of a simplified version of Discourse Representation Theory (Kamp and Reyle 1993; Asher 1999; von Heusinger 1999). A representation of a simple narrative in terms of discourse representation structures is given in Figure 5.32 on the next page. There is a discourse representation structure for each sentence, and it contains the referents and the proposition expressed in the sentence. Coreference relations between pronominals and established referents are explicitly represented. In order to derive the different focus structures, it is necessary to have a representation of the presupposition and the assertion. According to von Heusinger (1999:202), 'the background structure is constructed in the same way [as the foreground, i.e. asserted, structure] except for focused expressions, which are represented by a designated variable of the appropriate type'. The variables relevant to this discussion are *P* 'predicate'

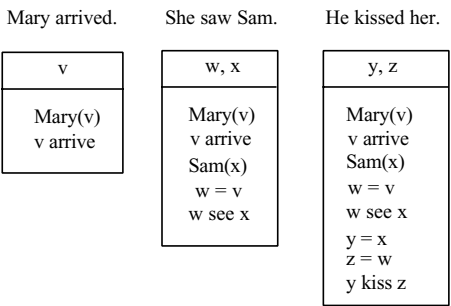


Figure 5.32 A simple example of discourse representation structures

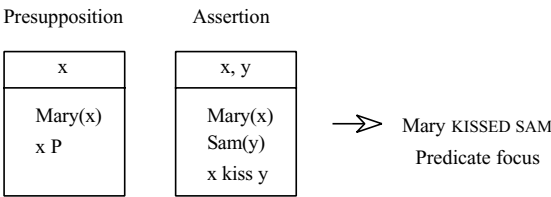


Figure 5.33 Derivation of predicate focus

and X ‘individual’. Following Lambrecht, the focus structure is the material in the assertion not contained in the presupposition. The derivation of predicate focus is illustrated in Figure 5.33. The presupposition represented in the first discourse representation structure, namely that there is a discourse referent ‘Mary’ and that she is the subject of some predicate, could be established by a question like *What did Mary do?* In the assertion discourse representation structure, ‘Sam’ and ‘kissed Sam’ are not contained in the presupposition discourse representation structure, and they therefore constitute the actual focus domain, yielding predicate focus. The derivation of completive and contrastive narrow focus on the privileged syntactic argument is illustrated in Figure 5.34. In the example of completive

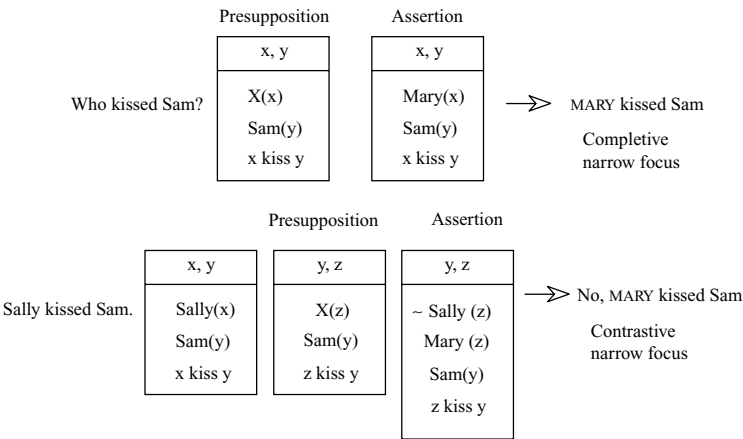


Figure 5.34 Derivation of completive and contrastive narrow focus

narrow focus, the background or presupposition is established by the question *Who kissed Sam?* The discourse representation structure contains an unspecified referent variable. In the assertion discourse representation structure, the referent of that variable is specified, resulting in completive narrow focus on *Mary*. In the second example, the presupposition is established by the assertion *Sally kissed Sam*, and the contrastive assertion is that the *x* who kissed Sam is Mary, not Sally.

In the discussion of linking earlier in the chapter, information structure was not involved, save for the specification of the activation status of the referents in the semantic representations. Figure 5.35 gives the summary linking from Figure 5.10 for *Sandy presented the flowers to Chris at the party* in a predicate focus context. The proposition in the assertion discourse representation structure is a simplified representation which corresponds to the semantic representation used in the linking.

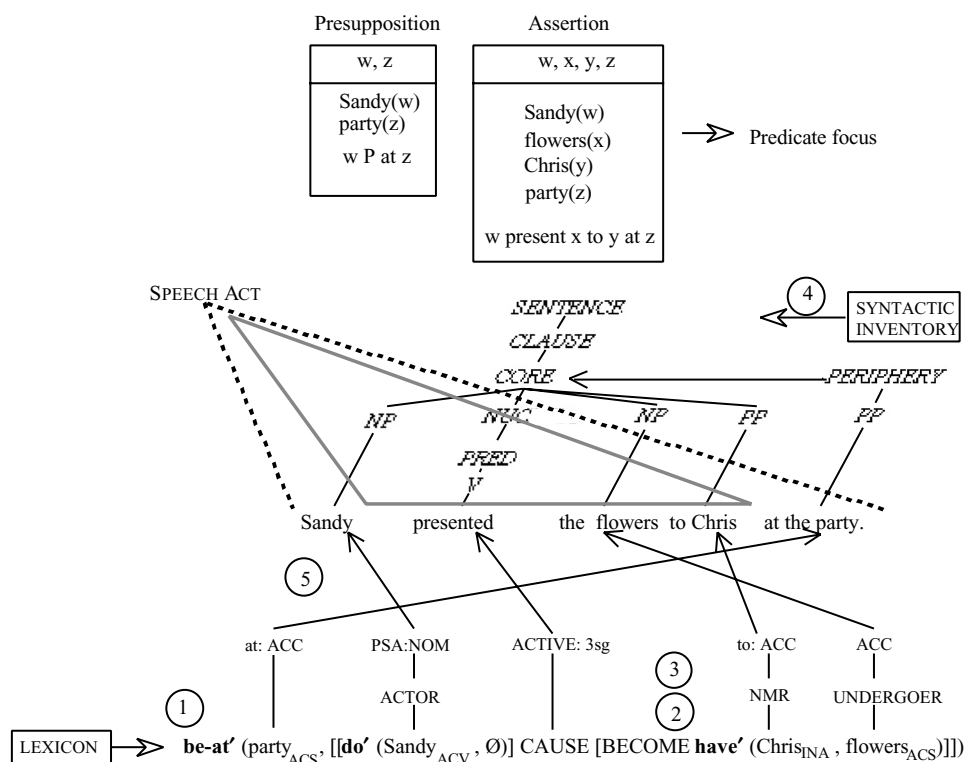


Figure 5.35 Derivation of predicate focus in the linking in Figure 5.10

The use of discourse representation structures in representations of linking offers a new approach to the problem of argument linking in languages with extensive discourse-driven zero anaphora, e.g. Thai, Mandarin, Japanese. Consider the following short narrative from Mandarin, discussed in Van Valin and LaPolla (1997:231–2).

- (5.33) a. Lǎo Qián<sub>i</sub> yǒu zhème ge píqì,  
Old Qian have such CL disposition  
'Old Qian<sub>i</sub> has (just) such a disposition:
- b. *pro*<sub>i</sub> wèn péngyǒu<sub>j</sub> yào shénme dōngxì<sub>k</sub>,  
ask friend want what/something thing  
if (he<sub>i</sub>) asks for something from (his) friend(s),
- c. *pro*<sub>j</sub> lìkè jiù děi gěi *pro*<sub>i</sub> *pro*<sub>k</sub>.  
at-once then must give  
(he/she/they<sub>j</sub>) must give (it<sub>k</sub>) (to him<sub>i</sub>) at once.'

In (5.33c) none of the arguments are overtly instantiated in the clause, and the standard treatment of such sentences is to posit zero anaphora, in this case three null pronominals. Having an explicit representation of discourse referents, provided by the discourse representation structures, makes an alternative analysis possible: in languages like these the discourse referents can be linked directly to the semantic representation, thereby satisfying the completeness constraint. No zero anaphora need be posited in such an account. The discourse representation structures for the sentences in (5.33) are given in Figure 5.36. The linking from

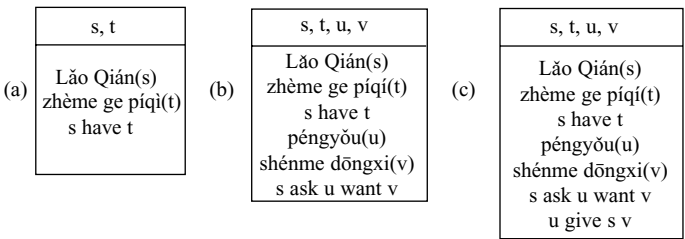


Figure 5.36 Discourse representation structures for (5.33a–c)

discourse representation structure to semantics for (5.33c) is given in Figure 5.37 on the next page. The clause consists only of adverbials, a modal verb and the main verb; there are no morphosyntactically instantiated arguments in it. The completeness constraint would have to be modified slightly for these languages, in order to allow discourse referents in addition to overt XPs to satisfy it.

5.4.2 Focus structure and linearization

It has long been known that in some languages discourse-pragmatics can strongly affect word order, and in chapter 3 numerous examples of the interaction of focus structure and word order were presented. The differential activation status of NPs is not a major factor in determining the word order of English sentences, but it is in Italian, as focus structure considerations can have a profound effect on the order of elements in an Italian utterance. This was shown

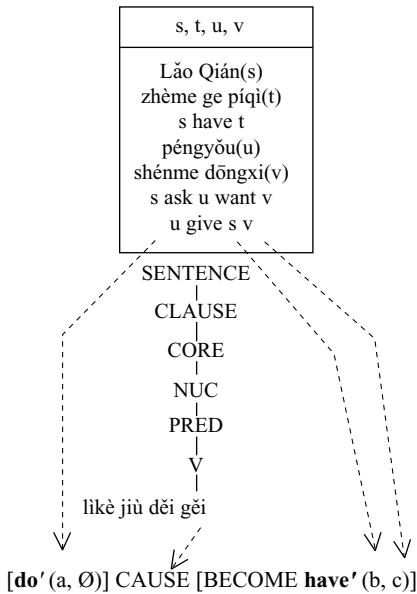


Figure 5.37 Linking directly from discourse representation structure to logical structure to satisfy the completeness constraint in Mandarin

in the contrast between the (S)V predicate focus construction in (3.1b) and the VS sentence focus construction in (3.3b); they are repeated in (5.34).

- (5.34) a. (La mia macchina) si è **ROTTA**. (=3.1b)  
 b. Mi si è rotta la **MACCHINA**. (=3.3b)  
 'My car broke down.'

Since prenuclear core-internal elements are necessarily topical in Italian and core-internal focal elements must be postnuclear, the activation status of an argument crucially determines its position in a clause, if it is to appear overtly: an activated argument would normally occur in a prenuclear position in the core, as in (5.34a), while an inactive one functioning as focus would have to occur in a postnuclear position, as in (5.34b).

A more subtle and interesting interaction of linking and focus structure involves the clitic pronoun *ne*. It has figured prominently in discussions of split intransitivity (so-called 'unaccusativity') in Italian, because it pronominalizes quantified 'direct objects' of transitive verbs and the inverted 'subjects' of a certain class of intransitive verbs. This is illustrated in (5.35)–(5.37) (some of the examples are from Centineo 1996).

- (5.35) a. Maria ha compra-to due chili di frutta.  
 have-3sg buy-PSTP two kilos of fruit  
 'Maria bought two kilos of fruit.'

- b. Maria ne ha comprati due.  
'Maria bought two of them.'
- c. Molte ragazze hanno comprato il libro.  
many girls have bought the book  
'Many girls bought the book.'
- d. \*Molte ne hanno comprato il libro.  
'Many of them bought the book.'
- e. \*Ne hanno comprato il libro, molte.  
'Many of them bought the book.'
- (5.36) a. Molte ragazze sono arriva-t-e.  
many girls be.3pl arrive-PSTP-3Fpl  
'Many girls arrived.'
- b. \*Molte ne sono arrivate.  
'Many of them arrived.'
- c. Sono arrivate molte ragazze.  
'Many girls arrived.'
- d. Ne sono arrivate molte.  
'Many of them arrived.'
- (5.37) a. Molte ragazze hanno telefona-to.  
many girls have.3pl telephone-PSTP  
'Many girls telephoned.'
- b. \*Molte ne hanno telefonato.  
'Many of them telephoned.'
- c. Hanno telefonato molte ragazze.  
'Many girls telephoned.'
- d. \*Ne hanno telefonato molte.  
'Many of them telephoned.'

The facts in (5.35)–(5.37) show that both semantic and pragmatic factors are involved in the analysis of *ne*. Not all arguments of a verb can be pronominalized with *ne*; actors of transitive (5.35) and intransitive (5.37) verbs are excluded. In Centineo (1986) and Van Valin (1990) it is shown that *ne* is restricted to state, achievement and accomplishment verbs (cf. n. 8 in chapter 2) and that it realizes the lowest ranking argument (in terms of the actor–undergoer hierarchy) of the state predicate in the logical structure of the predicate in the clause. This explains the restrictions on the arguments which can be realized by *ne*, but it does not account for the contrast between (5.36b) and (d). However, given what has been shown about the interaction of word order and focus structure in Italian, an obvious hypothesis suggests itself: *ne* realizes the head of a quantified NP in which the quantifier must be focal. Since it is a third-person pronoun, it must be topical, and therefore it must occur preverbally; the quantifier, on the other hand, is focal and therefore must be postverbal. The split topic–focus properties of this NP can be seen clearly in (5.38).



- (5.38) Q: Quanti student-i sono venu-t-i alla festa?  
 how.many student-pl be.3pl come-PSTP-3Mpl to.the party  
 ‘How many students came to the party?’
- A: Ne sono venu-t-i ventiquattro.  
 ne be.3pl come-PSTP-3Mpl twenty-four  
 ‘Twenty four of them came.’

The question in (5.38) establishes *studenti* ‘students’ as topical, and the element in the answer corresponding to the WH-word in the question must be focal. *Ne* instantiates the topical head noun, while the focal quantifier appears, as predicted, in immediately postverbal position. Thus a complete statement of the semantic and pragmatic conditions on *ne* would be as in (5.39).

- (5.39) *Ne*-cliticization: *ne* realizes the topical head of an NP with a focal quantifier, and this NP must be the lowest ranking argument (in terms of the actor–undergoer hierarchy) of the state predicate in the logical structure of the predicate in the clause.<sup>15</sup>

The linking in (5.35b) is presented in Figure 5.38 on the next page; the numbers refer to the steps in (5.5).<sup>16</sup> Steps 1 through 3 are collapsed in this representation. The most significant step is step 5, the mapping of the arguments into the syntactic template. *Ne* adds a special wrinkle: it is topical, but it must co-occur with a *focal* quantifier. Hence the NP must be split into pronominal head and quantifier, and each must be assigned a different position in the clause, because of the constraints on the potential focus domain in Italian discussed in chapter 3; the clitic pronoun must occur before the finite verb or auxiliary, while the focal quantifier appears in the immediate post-nuclear primary focus position. This yields another example of discontinuous constituency of the kind discussed in section 1.6, and as in the Dyirbal discontinuous NPs in Figure 1.21, the quantifier and the pronoun are related via the operator projection of the NP.

*Ne* appears to be subject to a curious set of semantic and pragmatic restrictions; on the one hand, it occurs only with a restricted class of verbs and then only with a specific type of argument, and this argument must be partially focal. These seemingly disparate restrictions do, however, relate to each other in a principled way. In the first place, the ‘direct object’ of transitive verbs and inverted ‘subjects’ of intransitive verbs all occur in the immediate post-nuclear focus position; ‘subjects’ of transitive verbs cannot appear there and are consequently not potential foci. But why should *ne* be restricted to some intransitive verbs and not others,

<sup>15</sup> *Ne* cannot, however, realize the quantified single argument of attributive/identificational *essere* ‘be’, which otherwise behaves like an ‘unaccusative’ verb, and this follows from the RRG analysis; see Van Valin (1990), Schwartz (1993). See Bentley (2004) for a detailed analysis of a wider range of uses of *ne* which shows that (5.39) is applicable to all of them.

<sup>16</sup> The semantic representation for the NP containing *ne* would be  $\langle_{\text{DEF}} - \langle_{\text{NEG}} - \langle_{\text{QNT}} \text{due}_{\text{INA}} \langle_{\text{NUM}} \text{pl} \langle_{\text{NASP}} \text{COUNT} (\text{ne}_{\text{ACV}}) \rangle \rangle \rangle \rangle$ . See Van Valin and LaPolla (1997: section 4.7.5).

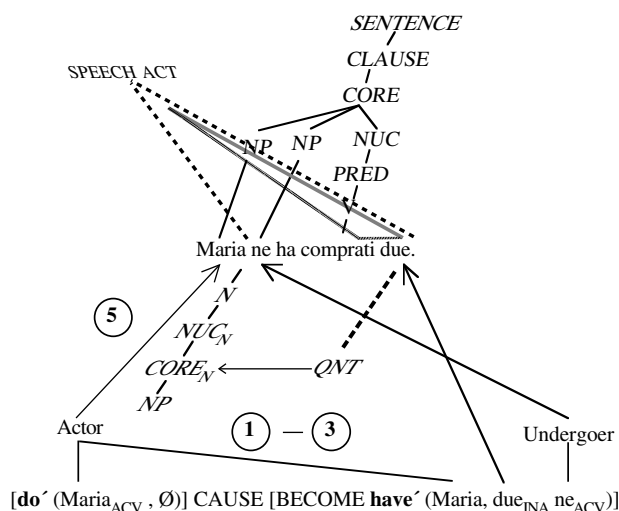


Figure 5.38 *Linking from semantics to syntax in ne-cliticization*

i.e. to non-activity verbs? The answer lies in the semantics of the constructions in which inverted ‘subjects’ tend strongly to occur in Italian. As discussed in section 3.2, the prototypical case involving inverted word order is the sentence focus construction, as in (5.34b), and the most common kind of sentence focus construction is presentational, as in the English examples in (3.4). It is here that the restrictions on verb classes emerge. Lambrecht comments on the verbs that typically occur in sentence focus constructions.

Another argument in favor of the interpretation of SF [sentence focus] structures as presentational in a broad sense can be seen in the constraints imposed in many languages on the kinds of predicates which SF structures may contain . . . [T]he predicates most commonly permitted in SF sentences involve ‘presenting’ verbs, i.e. intransitive verbs expressing appearance or disappearance of some referent in the internal or external discourse setting, or the beginning or end of some state involving the referent. (1987: 373)

The verbs which Lambrecht describes are the prototypical ‘unaccusative’ verbs in Italian, and thus there is a fundamental relationship between verb type, on the one hand, and sentence focus constructions, on the other; Kuno (1972a) makes a similar argument. Since the prototypical cases of inverted word order are sentence focus constructions, the restriction to intransitive achievement and accomplishment verbs follows naturally.<sup>17</sup>

<sup>17</sup> It was noted in n. 15 that *ne* does not occur with attributive/identificational *essere* ‘be’ (see Schwartz 1993), an otherwise ‘unaccusative’ verb, and there are clear pragmatic reasons for it: attributive/identificational ‘be’ does not function as a presentational verb, in Lambrecht’s sense (1987:374). But, as Schwartz shows, locative and existential uses of *essere* do allow *ne*-cliticization, and this is predicted by the semantic analysis in Van Valin (1990) and by this pragmatic analysis. See also Bentley (2004).

### 5.4.3 Focus structure and questions

An important area of the interaction of focus structure and linking is the formation of questions, especially WH-questions, and in this section question formation in simple sentences in Lakhota and Turkish and the conditions on preposition stranding in English will be examined.

Question formation in Lakhota involves no change in the syntactic form of clauses, unlike in English; rather, questions are signalled by the addition of the particle *he* to the end of the clause, as illustrated in (5.40).

- (5.40) a. Šýka ki igmú wá yaxtáke.  
           dog the cat a bite  
           ‘The dog bit a cat.’  
       b. Šýka ki igmú wá yaxtáka he?  
           ‘Did the dog bite a cat?’  
       c. Šýka ki táku yaxtáke.  
                     what/something  
           ‘The dog bit something.’  
       d. Šýka ki táku yaxtáka he?  
           ‘What did the dog bite?’, or ‘Did the dog bite something?’

WH-words in Lakhota occur *in situ*, as (5.40d) shows; Lakhota instantiates option (5b1) in the semantics-to-syntax linking algorithm in (5.5). Such *in situ* WH-questions present no special problems for the syntax-to-semantics linking algorithm, since the WH-word appears in the position appropriate for its interpretation, just like a non-WH NP.

Lakhota WH-words are ambiguous between a question word and an indefinite pronoun interpretation, as the contrast between (5.40c,d) exemplifies. *He* overtly instantiates the illocutionary force operator over the clause, and the element questioned must be focal. In (5.40d), the actual focus domain may be either *šýka ki* ‘the dog’, *táku* ‘what/something’, or *yaxtáka* ‘bite’ (or combinations thereof), and where the focus falls determines the interpretation of the question; if it is on *táku*, then it is interpreted as a WH-question, whereas if the focus falls on either *šýka ki* or *yaxtáka* (or both), then it is construed as a yes–no question. The contrast in focus structure between two of the possible readings of (5.40d) is represented in Figure 5.39. (Lakhota is a head-marking language; see section 1.4; Van Valin 1985, 1987.)

In step 5b of the semantics-to-syntax linking algorithm in (5.5), four possible linkings in WH-questions are specified, and three of them have been illustrated thus far: WH *in situ*, e.g. Lakhota in (5.40d) (step 5b1), occurrence in the precore slot, e.g. English (step 5b2), and occurrence in the postcore slot, e.g. Dhivehi in (1.3a) (step 5b2). The fourth possibility, occurrence in the unmarked focus position in the clause, can be illustrated with the following data from Turkish (Erguvanlı 1984).

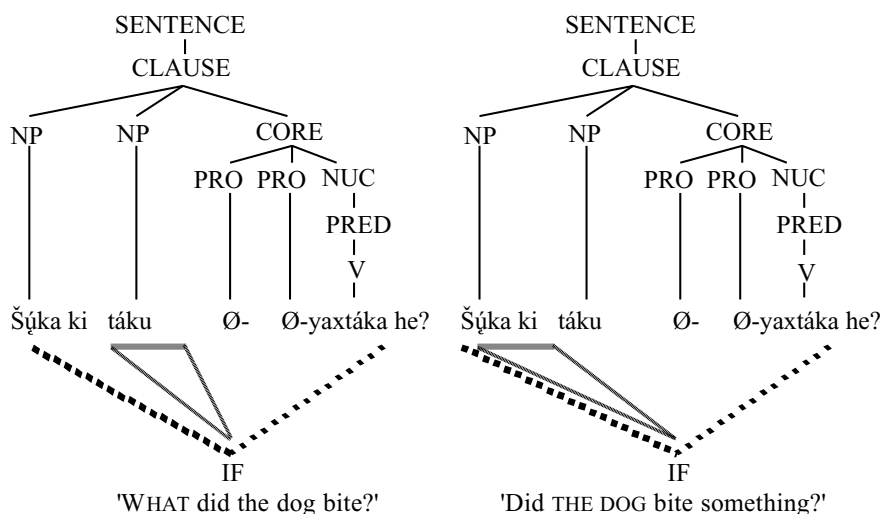


Figure 5.39 Focus structure contrasts in Lakhota WH- and yes-no questions

- (5.41) a. Murat paray-ı (banka-dan) çaldı.  
money-ACC (bank-from) stole  
'Murat stole the money (from the bank).'
- b. Paray-ı (banka-dan) kim çaldı?  
money-ACC (bank-from) who stole  
'Who stole the money (from the bank)?'
- b'. \*Kim (bankadan) parayı çaldı?
- b''. \*Bankadan kim parayı çaldı?

In Turkish, as in many other verb-final languages, the unmarked focus position is the immediately preverbal position, and it is in this position that WH-expressions must occur in WH-questions, as the ungrammaticality of (5.41b',b'') shows. Hence in linking Turkish WH-questions step 5b3 comes into play.

Preposition stranding of the kind found in English is a rare phenomenon cross-linguistically, and it raises certain problems for the linking algorithm. The statement of the semantics-to-syntax linking algorithm in (5.5) specifies simply that a WH-word appears in the precore slot, and this is the case for unmarked WH-questions in English. A WH-word is always a narrow focus in a question, regardless of whether it occurs *in situ* or in the precore slot. It was stated in section 3.4 that the basic information units in the information structure of the clause are predicates, arguments (NPs, PPs, clauses) and peripheral PPs and adverbials, and the various WH-words in the language reflect this, e.g. *what*, *who* = NP, *where*, *when* = PP, adverbial. The internal components of these basic information units cannot be questioned directly using a simple WH-word, as the impossibility of the question-answer pairs in (5.42a,b) shows.

- (5.42) a. \*Q: Who did Chris see a tall?  
           A: Stock car driver.
- b. \*Q: What / what kind of / which did Chris see a stock car driver?  
           A: Tall.

This is also shown by the inability to question a single NP in a conjoined NP, e.g. *\*Who did you see and Dana?*; here too an element of the internal structure of a basic information unit is being questioned, yielding an ungrammatical question.

This raises interesting issues regarding preposition stranding in English, in which it appears that a basic information unit, the PP, is being broken up and the head stranded. This is not possible in all cases, however, as (5.43c) shows.

- (5.43) a. Who did Pat give the book to?  
       b. What did Pat put the letter in?  
       c. \*What did Pat eat breakfast in?  
       d. Where did Pat eat breakfast?

The difference between (5.43a,b) and (5.43c) is that *to* and *in* in the former examples are non-predicative, while *in* in (5.43c) is predicative (see section 1.6). The non-predicative ones are predictable from the meaning of the verb, and consequently in non-predicative PPs the primary information resides in the NP object. This is reflected in the structural representation of non-predicative PPs in Figure 1.15a, in which the preposition is not treated as a semantic predicate contributing anything semantically to the core. This contrasts sharply with the structure of predicative PPs in Figure 1.15b, in which the preposition is not licensed by the verb and functions as a predicate in its own right (hence the name), licensing its own argument. In this case both the preposition and its object are unrecoverable and therefore are high in information content; they function as a single complex information unit and cannot be broken up under normal circumstances, as the ungrammaticality of (5.43c) indicates.

It is possible to strand a predicative preposition, but the pragmatic restrictions on it are very different from those governing the sentences in (5.43). First, the neutral WH-word for NPs, *what*, cannot be used; this is shown by the ungrammaticality of the unstranded version of (5.43c), *\*In what did Pat eat breakfast?* Rather, only the NP-determiner WH-word *which* is possible, as in (5.44a), and stranding is possible, as in (5.44b).

- (5.44) a. In which room did Pat eat breakfast?  
       b. Which room did Pat eat breakfast in?

A question like (5.43d) requires no special context, whereas one like (5.44b) requires a context in which the locations of Pat's activities are being discussed, so that what is presupposed is 'Pat does specific activities in specific rooms'; in this context, the preposition is presupposed and therefore recoverable, just like a non-predicative preposition. Hence whether or not preposition stranding in a

WH-question is possible is not simply a matter of syntax; it is, rather, an issue of recoverability of information, either from lexical information or from context.<sup>18</sup>

#### 5.4.4 The pervasive role of discourse-pragmatics in grammar

From an RRG perspective, discourse-pragmatics literally permeates grammar, as it can play a role in virtually every aspect of grammar. Numerous examples of this have been given in this chapter and chapter 3. This can be summarized as in Figure 5.40. From the lexicon to the syntactic inventory and to the different steps in the linking algorithm that relates them, discourse-pragmatics can influence every aspect of grammar, and a major claim of RRG is that an important source of cross-linguistic variation is the differences in this interaction. Several examples were given in earlier chapters: whether focus structure is grammaticalized into a VP, whether a language has pragmatically influenced variable pivots and controllers, how focus structure and clause structure interact, and whether focus structure influences case assignment and linearization.

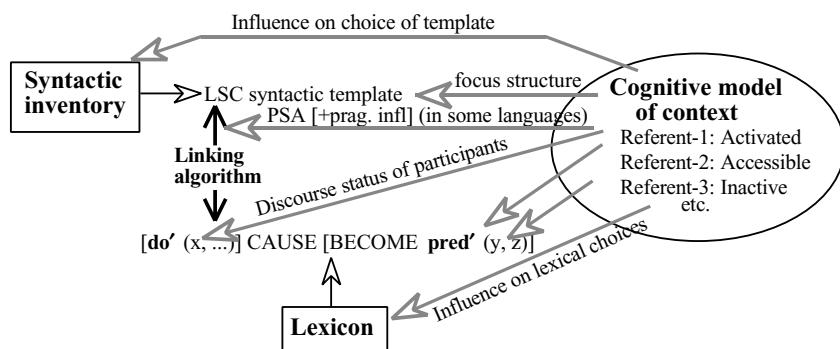


Figure 5.40 *The pervasive role of discourse-pragmatics in grammar*

<sup>18</sup> For a detailed discussion of preposition stranding, see Takami (1988), Suzuki (1991), and Whaley (1993).

## 6 The structure of complex sentences

### 6.0 General considerations

The starting point for the discussion of the syntax–semantics–pragmatics interface in complex sentences is the syntactic structure of complex sentences. The units of the layered structure of the clause play a central role in the RRG theory of clause linkage, as they are the units which constitute the building blocks of complex sentences, and given RRG’s approach to clause-internal relational structure, it is perhaps not surprising that the RRG theory of interclausal relational structure diverges from the standard analyses. Focus structure in complex sentences will also be discussed in this chapter, as well as the structure of complex NPs.

### 6.1 Nexus relations

Traditional, structural and generative grammar have all operated on the assumption that there are two linkage or ‘nexus’ types, coordination and subordination. Switch-reference constructions, particularly those in the languages of Papua-New Guinea as illustrated in (4.23), have long presented a vexing problem for theories of complex sentence structure. Coordination is characterized by the joining of two or more units of equal size and status, and, in the case of whole clauses, all of the clauses have the form of independent main clauses. Subordination, on the other hand, involves the embedding of one unit in another, and the embedded unit does not normally have the form of independent main clauses. The embedded clause functions either as an argument, as in complementation, or as a modifier, as in adverbial subordinate clauses. (Cf. Lyons 1968:178.) Clause chains with switch-reference marking are problematic for this traditional dichotomy, because they seem to have properties of both coordination and subordination, and in some languages they contrast structurally with clear cases of coordination and subordination. This is illustrated in the Kewa examples (Franklin 1971) in (6.1).

- (6.1) a.      Nipú ípu-la                      pare ní      paalá na-pía.  
                 3sg   come-3sgPRES   but   1sg   afraid   NEG-be.1sgPRES  
                 ‘He is coming, but I am not afraid.’

- b. (Ní) Épo lá-ri épa-wa.  
 1sg whistle say-SIM.SS come-1sgPAST  
 'I whistled while I came,' or 'I came whistling.'
- c. (Ní) Épo lá-lo-pulu irikai épa-lia.  
 1sg whistle say-1sgPRES-CAUSAL dog come-3sgFUT  
 'Because I am whistling, the dog will come.'

The first example is a classic case of coordination, with each clause occurring in fully independent form; that is, *nipú ípu-la* 'He is coming' and *ní paalá na-pía* 'I am not afraid' are potentially independent sentences in their own right. The second example (6.1b) is an example of a switch-reference construction, and it differs from (6.1a) in a significant way, namely, the verb in the first clause carries no person and tense marking, unlike the verb in the second clause. This means that while *épa-wa* 'I came' could be a complete, independent sentence, (*ní*) *épo lá-ri* could not. The first clause is dependent on the second for expression of its person and tense marking. This dependence would normally be construed as evidence of subordination, but in fact the first clause does not have the form of a subordinate clause in Kewa, which is illustrated in (6.1c). The verb in a subordinate clause is marked for person and tense, unlike the verb in the first clause in (6.1b), and in addition there is a morpheme indicating the semantic relation of the subordinate clause to the main clause, *-pulu* 'because'. A minimal pair of dependent and subordinate constructions can be seen in the following sentences from Chuave (Thurman 1975), another Papuan language.

- (6.2) a. Yai kei su-n-g-a fu-m-e.  
 man dog hit-3sg-DEP-NONSIM go-3sg-IND  
 'After the man hit the dog, he went away.'
- b. Yai kei si-re fu-m-e.  
 man dog hit-SEQ.SS go-3sg-IND  
 'The man hit the dog and went away.'

Both Franklin and Thurman argue that these switch-reference constructions are not examples of subordination, despite the obvious dependence between the first clause and the second.

J. Roberts (1988) presents a detailed account of the structural relation holding between clauses in a switch-reference construction in Amele, another Papuan language. Like Franklin and Thurman, he argues that they are not instances of subordination, even though there is dependence for categories like tense and mood across the units in the linkage. Simple examples of Amele switch-reference are given in (6.3).

- (6.3) a. Ija hu-m-ig sab j-ig-a.  
 1sg come-SS-1sg food eat-1sg-TPAST  
 'I came and ate the food.'



- b. Ija ho-co-min sab ja-g-a.  
 1sg come-DS-1sg food eat-2sg-TPAST  
 'I came and you ate the food.'

Possible evidence against analysing these constructions as coordinate comes from the fact that tense, mood (illocutionary force) and negation can be shared across clauses in this construction, in contrast to regular coordinate structures in which these may each be specified independently. The dependence in switch-reference constructions is illustrated in (6.4)–(6.6).

- (6.4) a. Ho busale-ce-b dana age qo-ig-a. Tense  
 pig run.out-DS-3sg man 3pl hit-3pl-TPAST  
 'The pig ran out and the men killed it.'
- b. Ho busale-ce-b dana age qo-qag-an.  
 pig run.out-DS-3sg man 3pl hit-3pl-FUT  
 'The pig will run out and the men will kill it.'
- c. \*Ho busale-ce-b dana age qo-qag-an.  
 pig run.out-DS-3sg-TPAST man 3pl hit-3pl-FUT  
 'The pig will run out and the men will kill it.'
- (6.5) a. Ho busale-ce-b dana age qo-ig-a fo? Mood  
 pig run.out-DS-3sg man 3pl hit-3pl-TPAST Q  
 'Did the pig run out and did the men kill it?'  
 (\*'The pig ran out and did the men kill it?')
- b. \*Ho busale-ce-b fo dana age qo-ig-a.  
 pig run.out-DS-3sg Q man 3pl hit-3pl-TPAST  
 'Did the pig run out (?) and the men killed it.'
- (6.6) a. Ho busale-ce-b dana age qee qo-l-oin. Negation  
 pig run.out-DS-3sg man 3pl NEG hit-NEGPAST-3pl  
 'The pig ran out and the men did not kill it.'
- b. Ho qee busale-ce-b dana age qo-l-oin.  
 pig NEG run.out-DS-3sg man 3pl hit-NEGPAST-3pl  
 'The pig didn't run out and the men did not kill it.'
- c. \*Ho qee busale-ce-b dana age qo-ig-a.  
 pig NEG run.out-DS-3sg man 3pl hit-3pl-TPAST  
 'The pig didn't run out and the men killed it.'

Both clauses in (6.4) must have the same tense, as indicated on the final verb of the sequence; there is no morphological slot for the tense morpheme in the dependent verb. The same is true with respect to mood; the question particle *fo* can appear only at the end of the sequence and must be interpreted as having scope over the entire construction. Negation is slightly more complicated. The negative marker *qee* indicates the scope of negation in the construction, which is to the right of the marker, and it is possible to negate only the final clause in the chain, as (6.6a) shows, or both clauses, as in (6.6b). It is not possible, however, to negate only the first verb in the chain, as (6.6c) indicates.

Coordinate constructions in Amele, on the other hand, do not have these constraints; the individual conjuncts can be specified independently for tense, mood and negation.

- (6.7) a. Fred cum ho-i-an qa Bill uqadec h-ugi-an. Tense  
 yesterday come-3sg-YPAST but tomorrow come-3sg-FUT  
 'Fred came yesterday, but Bill will come tomorrow.'
- b. Ho busale-i-a qa dana age qo-i-ga fo? Mood  
 pig run.away-3sg-TPAST but man 3pl hit-3pl-TPAST Q  
 'The pig ran away, but did the men kill it?'
- c. Ho qee busale-l-Ø qa dana age qo-ig-a. Negation  
 pig NEG run.away-NEGPAST-3sg but man 3pl hit-3pl-TPAST  
 'The pig didn't run away, but the men killed it.'
- d. Ho busale-i-a qa dana age qee qo-l-oin.  
 pig run.away-3sg-TPAST but man 3pl NEG hit-NEGPAST-3pl  
 'The pig ran away, but the men didn't kill it.'

Thus switch-reference constructions behave rather differently from coordinate structures with respect to categories like tense and negation. Roberts also points out that they differ from subordinate constructions as well, in that independent specification of tense and negation is possible in main and subordinate clauses.

These constructions involve dependence, namely operator dependence, but it is not clear that they count as subordination. Roberts notes that there are three types of genuine subordinate clause in Amele: complement clauses with verbs of cognition and saying, relative clauses, and adverbial clauses. The switch-reference constructions cannot be considered examples of the first two; the dependent clauses are clearly not relative clauses, and they also do not function as arguments of the matrix verb. Moreover, switch-reference marking is not found in complements and relative clauses. The only other possible kind of subordinate clause they could be is an adverbial clause of some type. Roberts presents a number of arguments against an adverbial clause analysis, two of which will be mentioned here. First, it is possible for subordinate clauses, but not for coordinate clauses, to appear in an extraposed position after the main verb; switch-reference constructions behave like coordinate constructions in this regard.

- (6.8) a. Ija ja hud-ig-a eu nu, uqa sab mane-i-a. Subordination  
 1sg fire open-1sg-TPAST that for 3sg food roast-3sg-TPAST  
 'Because I lit the fire, she cooked the food.'
- b. Uqa sab mane-i-a, ija ja hud-ig-a eu nu.  
 3sg food roast-3sg-TPAST 1sg fire open-1sg-TPAST that for  
 'She cooked the food, because I lit the fire.'
- (6.9) a. Ija ja hud-ig-a qa, uqa sab mane-i-a. Coordination  
 1sg fire open-1sg-TPAST but 3sg food roast-3sg-TPAST  
 'I lit the fire, but she cooked the food.'

- b. \*Uqa sab mane-i-a, ija ja hud-ig-a qa.  
 3sg food roast-3sg-TPAST 1sg fire open-1sg-TPAST but
- (6.10) \*Dana age qo-ig-a, ho busale-ce-b. Switch-reference  
 man 3pl hit-3pl-TPAST pig run.away-DS-3sg (cf. (6.4a))

Second, a pronoun in an initial subordinate clause can be coreferential with a full NP in the following matrix clause, but this is not possible in coordinate or switch-reference structures.

- (6.11) a. (Uqa<sub>i</sub>) ja hud-i<sub>i</sub>-a eu nu, Mary<sub>i</sub> sab mane-i<sub>i</sub>-a. Subordination  
 (3sg) fire open-3sg-TPAST that for food roast-3sg-TPAST  
 'Because she<sub>i</sub> lit the fire, Mary<sub>i</sub> cooked the food.'
- b. \*(Uqa<sub>i</sub>) ho-i<sub>i</sub>-a qa, Fred<sub>i</sub> sab qee je-l-Ø<sub>i</sub>. Coordination  
 (3sg) come-3sg-TPAST but food NEG eat-NEGPAST-3sg  
 \*'He<sub>i</sub> came, but Fred<sub>i</sub> didn't eat the food.'
- c. \*(Uqa<sub>i</sub>) bil-i-me-i<sub>i</sub> Fred<sub>i</sub> je-i<sub>i</sub>-a. Switch-reference  
 (3sg) sit-PRED-SS-3sg eat-3sg-TPAST  
 \*'He<sub>i</sub> sat and Fred<sub>i</sub> ate.'

With respect to these phenomena, then, switch-reference constructions behave like coordinate structures, not subordinate clauses. Thus, switch-reference constructions in Amele are examples of neither subordination nor simple coordination.

The same arguments can be made for Kewa, Chuave and other Papuan languages exhibiting switch-reference constructions. These constructions are therefore a kind of dependent coordination, in which units of equivalent size are joined together in a coordinate-like relation but share some grammatical category, e.g. tense or mood. This linkage or nexus relation was termed 'cosubordination' in Olson (1981), and it plays a crucial role in the RRG theory of clause linkage. Thus RRG posits three nexus relations between clauses in complex sentences (coordination, cosubordination and subordination) rather than the two of traditional, structural and generative grammar. The three relations may be represented schematically as in Figure 6.1 on the next page.<sup>1</sup>

It must be emphasized that the specific features of cosubordination sketched in this section apply to cosubordination involving whole clauses. The crucial property distinguishing cosubordination from coordination is operator dependence, and in these examples the shared operators have all been clausal operators. As will be shown in the following sections, cosubordination applies to subclausal units as well, and for them it will be operator dependence at the level of linkage that is definitive of cosubordination (see section 6.4 below).

<sup>1</sup> It is crucial to distinguish coordination, which is an abstract linkage relation between units, from conjunction, which is a formal construction which may or may not involve coordination. As will be shown below, coordination can be instantiated by a number of different construction types, and conjunction may serve to express both coordination and cosubordination.

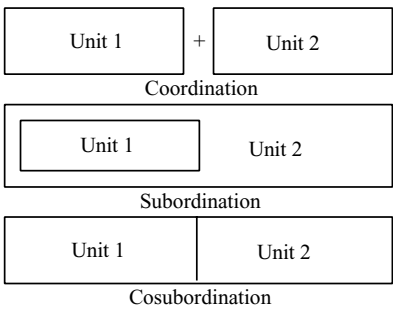


Figure 6.1 *Nexus types*

6.2 The layered structure of the clause and juncture

Nexus relations, the syntactic relations between the units in a complex construction, are only half of a syntactic theory of clause linkage; the other half concerns the nature of the units being linked. In RRG, this is called ‘juncture’. In all of the examples presented thus far, the units have been whole clauses, but linkage of subclausal units is equally common in complex sentences. The subclausal units postulated by RRG are those of the layered structure of the clause: the nucleus and the core. The three primary juncture types are represented schematically in (6.12).

- (6.12) a. [CORE . . . [NUC . . . ] . . . + . . . [NUC . . . ] . . . ] Nuclear juncture
- b. [CLAUSE . . . [CORE . . . ] . . . + . . . [CORE . . . ] . . . ] Core juncture
- c. [SENTENCE . . . [CLAUSE . . . ] . . . + . . . [CLAUSE . . . ] . . . ] Clausal juncture

All of the sentences in (6.1)–(6.11) are examples of clausal juncture; core junctures are exemplified in (6.13) and nuclear junctures in (6.16).

- (6.13) a. Chris forced Dana to leave the party. English
- b. Je laisserai Jean manger les gâteaux. French
- 1sg let.FUT John eat the cakes
- ‘I’ll let John eat the cakes.’
- c. Tā jiāo wǒ xiě zì. Mandarin Chinese
- 3sg teach 1sg write characters (Hansell 1993)
- ‘She teaches me to write.’
- d. Fu fi fase isoe. Barai (Olson 1981)
- 3sg sit letter write [Papua-New Guinea]
- ‘He sat (down) and wrote a letter.’
- e. Pat’s winning the race surprised everyone. English

In a core juncture there are two nuclei, each with its own set of core arguments, constituting two distinct cores. In non-subordinate core junctures they overlap in

that the linked units obligatorily share one core argument, whereas in a subordinate core juncture the linked unit serves as a core argument of the matrix verb. In (6.13a), *Dana* is semantically an argument of both verbs, as is *Jean* in (b), *wǒ* ‘I’ in (c), and *fu* ‘he’ in (d). Crucially, the other arguments are coded as arguments of particular nuclei, e.g. in (a) *Chris* is an argument, syntactically and semantically, of *force* only, while *the party* is similarly an argument of *leave* alone. In (6.13e), on the other hand, the gerundive core *Pat’s winning the race* functions as the ‘subject’ of the matrix verb *surprise*; hence it is a core argument and illustrates subordination at the core level. The French example in (6.13b) (which involves coordinate nexus) is represented in Figure 6.2; the linking between syntax and semantics in this example will be discussed in section 7.3.

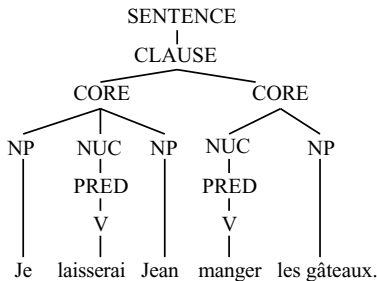


Figure 6.2 Core coordination in French

There is considerable syntactic evidence that the infinitival construction in sentences like *Pat wants to open the door* is not an instance of subordination; that is, these infinitives are not complements akin to *that*-clauses and gerunds. For example, they do not cleft like *that*-clauses and gerunds, and if they occur with a verb which can passivize, gerunds and *that*-clauses can occur as subject of the passive but the infinitive cannot. This is illustrated in the examples in (6.14).

- (6.14) a. Leslie regretted Kim's losing the election.  
 a'. Kim's losing the election was regretted by Leslie.  
 a''. It was Kim's losing the election that Leslie regretted.  
 b. Mary regretted slapping Bill the most.  
 b'. Slapping Bill was regretted by Mary the most.  
 b''. It was slapping Bill that Mary regretted the most.  
 c. Leslie regretted that Kim lost the election.  
 c'. That Kim lost the election was regretted by Leslie.  
 c''. It was that Kim lost the election that Leslie regretted.

In the following sentences with *want*, the simple NP complement can be clefted and can occur as the subject of a passive, just like the gerund and *that*-clause in (6.14), while the infinitive cannot.

- (6.15) a. Pat wanted to open the door.  
 a'. Pat wanted a new car.  
 b. \*It was to open the door that Pat wanted.  
 b'. It was a new car that Pat wanted.  
 c. \*To open the door was wanted by Pat.  
 c'. A new car was wanted by Pat.

*That*-clauses and gerunds are canonical examples of subordination, and since the infinitive does not behave syntactically like simple NP complements, gerunds or *that*-clauses, it cannot also be subordinate. The ungrammaticality of (6.15b,c) cannot be attributed to the lack of an overt privileged syntactic argument in the linked cores, because the linked cores in (6.14b', b'') also lack an overt privileged syntactic argument and yet are grammatical. Hence constructions like *Pat wanted to open the door* are a non-subordinate nexus type.<sup>2</sup> This is an example of a mismatch between syntax and semantics: the logical structure of the infinitival core is a semantic argument of the verb in the matrix core at the semantic level, but in the syntax it is not treated as a core argument. The logical structure of *Pat wanted to open the door* would be **want'** (Pat<sub>i</sub>, [[**do'** (x<sub>i</sub>, Ø)] CAUSE [BECOME **open'** (door)]]),<sup>3</sup> in which the logical structure for the transitive version of *open* is a semantic argument of the matrix verb *want*. However, as (6.15) shows, the infinitival core *to open the door* does not behave syntactically like a core argument.<sup>4</sup>

It was stated above that non-subordinate core junctures involve an obligatorily shared argument, but they are not the only juncture-nexus types in which argument sharing is possible. The examples of 'subjectless' gerunds in (6.14b,b',b'') are clear examples of core subordination, and yet *Mary* is construed as the actor of *slap* in the gerund. Hence there is a shared core argument between the matrix and subordinate cores. Note, however, that, unlike the constructions in (6.13a) and (6.15a), the argument sharing is not obligatory, since the gerund can have an overt 'subject', either possibly coreferential with the matrix 'subject', as in *Mary regretted her slapping Bill*, or distinct from it, as in (6.14a,a',a''). Thus, it appears that argument sharing is possible in both subordinate and non-subordinate core junctures, but it is obligatory only in non-subordinate core junctures.<sup>5</sup>

Nuclear junctures are illustrated in (6.16).

- |           |                                     |         |
|-----------|-------------------------------------|---------|
| (6.16) a. | Kim painted the table red.          | English |
| b.        | Je ferai manger les gâteaux á Jean. | French  |
|           | 1sg make.FUT eat the cakes to John  |         |
|           | 'I will make John eat the cakes.'   |         |

<sup>2</sup> See Van Valin and LaPolla (1997: section 8.4) for detailed discussion.

<sup>3</sup> The logical structure of control constructions like this will be discussed in section 7.3.1.

<sup>4</sup> There is interesting evidence from language acquisition supporting this analysis; see Van Valin and LaPolla (1997: Epilog), and Van Valin (2001a), for detailed discussion.

<sup>5</sup> See Paris (2003) for an analysis of a type of Spanish gerund construction which involves both core subordination and a shared core argument.

- c. Tā qiāo pò le yí ge fānwǎn. Mandarin Chinese  
 3sg hit break PRFV one CL ricebowl  
 'He broke (by hitting) a ricebowl.'
- d. Fu fāse fī isoe. Barai  
 3sg letter sit write  
 'He sat writing a letter.'
- e. X-in-y-a' mak-a' naj t-aw-et. Jakaltek  
 PAST-1sgABS-3ERG-cause hit-INF 3sg AUG-2sgERG-to  
 'He made you hit me.'

In a nuclear juncture, two or more nuclei combine to form a single, complex nucleus with a single set of core arguments. In contrast to non-subordinate core junctures in which there is a single shared argument, in nuclear junctures all of the arguments of the component verbs are 'pooled' to create a single set of core arguments for the derived complex nucleus. This is clearest in the French and Jakaltek (Craig 1977) examples in (6.16), in which the 'subject' and 'direct object' are contributed by different verbs, and the effector of the dependent verb, the causee, is coded as the 'indirect object' of the complex nucleus. Note also the different positioning of the 'direct object' in the French, Barai (Olson 1981) and Mandarin (Hansell 1993) examples; in the core junctures in (6.13), the argument which is semantically the undergoer of the first verb and the actor of the second occurs between them; in the nuclear junctures, however, the verbs occur adjacent to one another, forming a single, complex predicate, and the undergoer appears immediately after (French, Mandarin) or before (Barai) the whole nucleus. The French nuclear juncture in (6.16b) (which involves cosubordinate nexus) is represented in Figure 6.3.

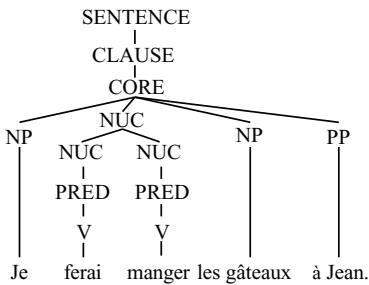


Figure 6.3 *French nuclear juncture*

There are, then, three primary levels of juncture, clausal, core and nuclear, and there are three possible nexus relations among the units in the juncture, coordination, subordination and cosubordination. All three types of nexus are possible in all three forms of juncture, and this yields nine juncture–nexus types in universal grammar. There are in addition two more juncture–nexus combinations, which are unique in that for the level of juncture the full range of nexus types is not available. They involve the linking of whole sentences, as in the English and Barai (Olson 1981) examples in (6.17).

- (6.17) a. As for Sam, Mary saw him last week, and as for Paul, I saw him yesterday.  
 b. Fu vua kuae-ga siare ije, fu naebe ume.  
 3sg talk say-SP/DT betelnut DEF 3sg NEG chew  
 'He was talking, and as for betelnut, he did not chew it.'

In the English example there are two complete sentences, each with its own left-detached PP. The Barai example is particularly interesting, as the linking morpheme *-ga* signals that the privileged syntactic arguments of the two sentences are the same but that there is a change of topic in the second sentence; the new topic appears in the left-detached position of the second sentence. This linkage will be termed 'sentential juncture', and the English example in (6.17a) will be represented as in Figure 6.4, with 'text' as the highest node dominating the two sentence nodes. The examples in (6.17) both involve coordination;

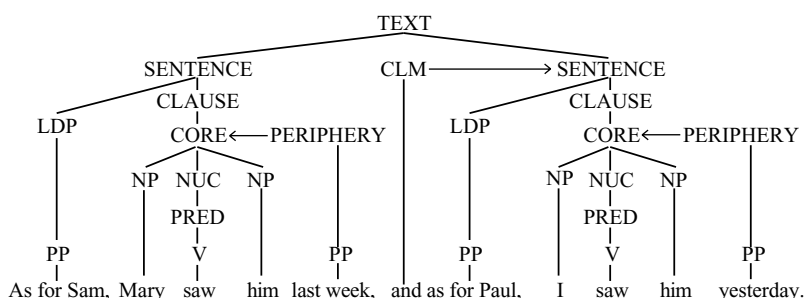


Figure 6.4 *Sentential coordination in English*

cosubordination is impossible at the sentence level, because there are no sentential operators that could be shared. Sentential subordination is possible, and it involves sentences or clauses occurring in the right- or left-detached positions. An example of a sentence in the left-detached position can be found in spoken Acadian French (Pavey 2001).

- (6.18) *Moi, quand j'étais jeune, on parlait seulement en français.*  
 I when I was young one spoke only in French  
 'Me, when I was young, we only spoke in French.'

In this example, *Moi, quand j'étais jeune* 'me, when I was young' is a preposed adverbial clause with its own left-detached expression, which makes it a sentence, and this sentence is then in the left-detached position of the matrix sentence. A simplified representation of its structure is given in Figure 6.5 on the next page. This is sentential subordination, because there is a sentence which is in the left-detached position, which makes it a daughter of the higher sentence node. A more common example of sentential subordination involves the fronting of peripheral adverbial clauses, as in (6.19).

- (6.19) After she arrived at the party, Kim saw Pat.

It was discussed in section 5.1.2 that adjunct PPs may be linked to the left-detached position, where they are set off by an intonation break, e.g. *After the*



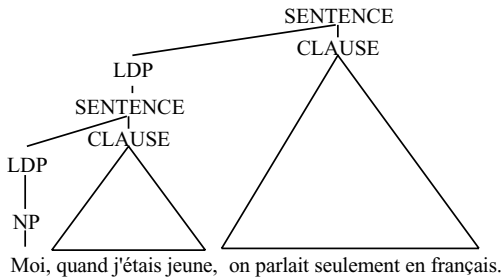


Figure 6.5 *Simplified structure of sentential subordination in (6.18)*

*concert*, *Kim saw Pat*, and the same holds for fronted peripheral subordinate clauses, as (6.19) shows. Another candidate for sentential subordination is direct discourse complements; the linked clause has independent illocutionary force, hence is a full sentence.

Not all instances of fronted adverbial clauses involve the left-detached position. German, which is a verb-second language, shows a clear contrast between fronted clauses which are in the left-detached position and those which are in the precore slot: a clause in the precore slot triggers inversion of the privileged syntactic argument and the finite verb or auxiliary, while one in the left-detached position does not. This is illustrated in (6.20), from Bickel (1993).

- (6.20) a. Wenn es regn-et, geh-e ich nicht raus. PrCS  
 if 3Nsg rain-3sgNPST, go-1sgNPST 1sgNOM not out  
 'If it rains, I don't go out.'
- b. Wenn er weiter so red-et, ich hör-e nicht zu. LDP  
 if 3Msg further so talk-3sgNPST, 1sgNOM listen-1sgNPST not to  
 'If he continues speaking like that, I just don't listen.'

In (6.20a) the finite verb and privileged syntactic argument are inverted, signalling that the initial conditional clause is in the precore slot. In (6.20b), on the other hand, there is no inversion, which means that the initial clause is outside of the clause and therefore in the left-detached position. English also has clear instances of a fronted clause in the precore slot, as illustrated in (6.21).

- (6.21) Bill was very angry, because after Mary arrived at the party she slapped him.

The fronted adjunct subordinate clause *after Mary arrived at the party* cannot be in the left-detached position, because it is inside an embedded clause, and embedded clauses cannot in principle have a left-detached position, which is outside of the clause. An embedded clause can, however, have a precore slot, since it is a clause-internal position, and therefore the preposed adverbial clause in (6.21) must be in the precore slot. This is an example of clausal subordination, since the embedded clause is in the precore slot, which is a daughter of the clause node.

There is a further complication involving subordination. Subordinate junct function either as arguments or adjunct modifiers. Adjunct PPs, as shown in sections 1.1 and 1.5, occur in the periphery<sub>CORE</sub> (see Figure 1.3); an example with its logical structure is given in (6.22).

- (6.22) a. [CLAUSE [CORE Kim saw Pat] <—[PERIPHERY after the concert]].  
 b. **be-after'** (concert, [see' (Kim, Pat)])

Some prepositions can also take clausal objects, and this results in an adjunct adverbial clause, which, like the adjunct PP in (6.22a), occurs in the periphery<sub>CORE</sub>. This is illustrated in (6.23).

- (6.23) a. Kim saw Pat after she arrived at the party.  
 b. **be-after'** ([BECOME **be-at'** (the party, 3sgF)], [see' (Kim, Pat)])

The relationship of the adverbial subordinate clause to the core it modifies is the same as that of a peripheral PP modifying a core; thus in *Kim saw Pat after the concert*, the relationship of the PP *after the concert* to the core *Kim saw Pat* is the same as that of the subordinate clause *after she arrived at the party* to the core it modifies. This will be referred to as 'ad-core subordination', because the subordinate clause is a modifier of the matrix core and occurs in the periphery<sub>CORE</sub>. The structure of (6.23a) is given in Figure 6.6.

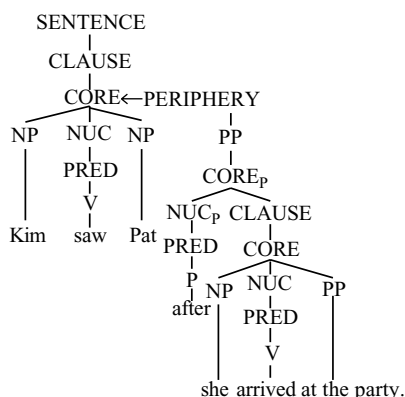
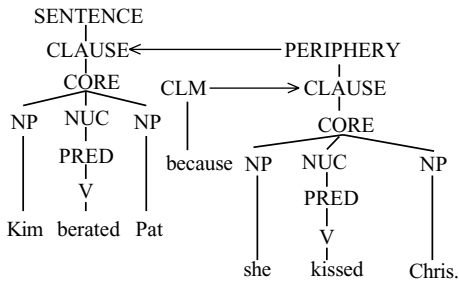


Figure 6.6 *Ad-core subordination in English*

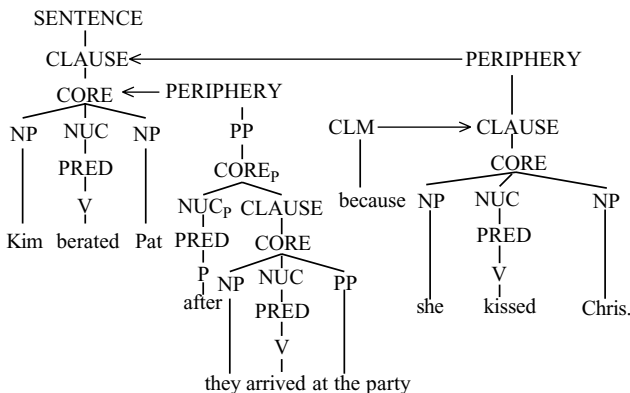
Not all adjunct clauses are objects of predicative adpositions, and those that are not, e.g. adverbial clauses marked by *because*, *if* or *although* in English, are not in the periphery<sub>CORE</sub>. Bickel (1993, 2003b) shows that these constructions have quite different properties from ad-core subordinate clauses, and labels them 'ad-sentential subordination'; a more appropriate name in RRG terms would be 'ad-clausal subordination'. Such a clause does not occur in the periphery<sub>CORE</sub> but rather in the periphery<sub>CLAUSE</sub>. Unlike ad-core subordinate clauses, they do not express the spatial or temporal setting of the event expressed by the core; they express, e.g., the reason or a condition for the event expressed by the clause as a whole. The structure of *Kim berated Pat because she kissed Chris* is

Figure 6.7 *Ad-clausal subordination in English*

given in Figure 6.7. This construction is an example of the clausal subordination juncture–nexus type. A piece of evidence that this type of adverbial clause occupies a different position from an ad-core subordinate clause comes from the fact that when the two co-occur in a single sentence, there is a definite preference for the ordering of the two clauses (Kwee 2002; Fried 2003), as shown in (6.24).

- (6.24) a. Kim berated Pat after they arrived at the party because she kissed Chris.  
 b. Kim berated Pat because she kissed Chris after they arrived at the party. ( $\neq$  (6.24a))

The strongly preferred ordering is (6.24a) with the ad-core subordinate clause preceding the ad-clausal subordinate clause; with the reverse order it is almost impossible to give the sentence the same interpretation, as the ad-core subordinate clause is construed as modifying the core in the *because*-clause, not the matrix core. This ordering preference follows from the structural differences between the two types of adverbial clauses, as Figure 6.8 clearly shows. The structures assigned to these two constructions predict that the ad-core subordinate clause should be closer to the matrix core than the ad-clausal subordinate clause, and this is in fact the strongly preferred order. While the RRG theory of the layered structure of the clause permits crossing branches (see, e.g., Figure 1.7 from Japanese), English does not normally allow structures with crossing branches, and accordingly the structure in Figure 6.8 is the only possible one with the *after*-clause interpreted as modifying the matrix core.

Figure 6.8 *Structure of (6.24a) with ad-core and ad-clausal subordinate clauses*

In section 1.5, in which peripheries for each level of the clause were introduced, the only examples of phrasal, i.e. PP, adjuncts were setting locative and temporal PPs in the periphery<sub>CORE</sub>. However, given that reason and concessive clauses occur in the periphery<sub>CLAUSE</sub>, it follows that reason and concessive PPs should occur in the periphery<sub>CLAUSE</sub> as well. Examples are given in (6.25).

- (6.25) a. Chris was angry because of Pat's insults.  
 b. Sandy was happy despite the bad weather.

Some English prepositions can also have a core as their argument; this is shown in (6.26).

- (6.26) a. Max brushed his teeth after drinking a cup of coffee.  
 b. Chris spoke to his broker before buying more stock.  
 c. Kim threw away the newspaper without reading it.

The objects of the prepositions are 'subjectless' gerunds, just as in (6.14b), which are a type of core. There is no reason not to analyse *after drinking a cup of coffee* as an adjunct in the periphery<sub>CORE</sub>, exactly analogous to *after breakfast* and *after he drank a cup of coffee*. This would be a second type of ad-core subordination, different from (6.23a) only in that the linked unit is a core rather than a clause. As in (6.14b), the privileged syntactic argument of the matrix core is interpreted as the actor of the linked, subordinate core, and accordingly there is a shared core argument in this construction as well. Unlike the construction in (6.14), however, it is not normally possible to have an overt 'subject' in the gerund, e.g. \**Chris spoke to his broker before his wife's buying more stock*.

There is a periphery modifying the nucleus of the clause, and in some languages there are subordinate modifiers in the periphery<sub>NUCLEUS</sub>; they are verbs used as aspect markers. An example from Lakhota is given in (6.27).

- (6.27) a. Wičháša ki lowá-he.  
           man     the sing-CONT  
           'The man is singing.'  
 b. Čhá ki/\*wičháša ki hé.  
      tree the/man     the stand  
      'The tree / \*the man stands.'

The continuative aspect marker *-hq* (realized as *-he*) is a verb meaning 'stand' which takes only an inanimate single argument, as (6.27b) shows. This means that in (6.27a) it is not part of the predicate structure, since the single argument is animate. It is, rather, a non-predicating nucleus used as a nuclear modifier, and it occurs in the periphery<sub>NUCLEUS</sub>; this would be ad-nuclear subordination. The structure of (6.27a) is given in Figure 6.9. There is no PRED node in the subordinate nucleus, because the verb does not predicate; it does not contribute an argument to the argument structure of the expression. Rather, it is a modifier. It is represented in the operator projection because it codes an aspect operator.

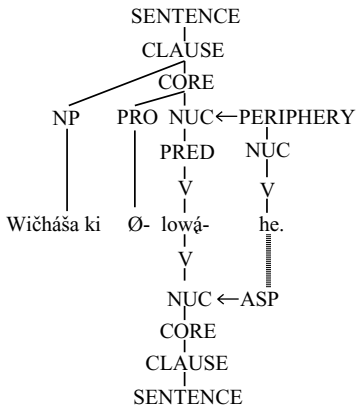


Figure 6.9 *Ad-nuclear subordination in Lakhota*

There are, therefore, two distinct types of subordination: daughter subordination, in which the subordinate junct is a daughter of a higher node, e.g. Figures 6.5, 6.11 and 6.12, and peripheral subordination, in which the subordinate junct is a modifier occurring in the periphery of a layer of the clause, e.g. Figures 6.8 and 6.9. Peripheral subordination subsumes ad-nuclear, ad-core and ad-clausal subordination.

Thus, in addition to the nine juncture–nexus types which result from the three primary parts of the layered structure of the clause combining with the three nexus types, there are two other juncture–nexus types: sentential subordination, and sentential coordination. In addition, there are two subtypes of subordination, daughter subordination and peripheral subordination.

A language need not have all eleven juncture–nexus types, and in fact most do not; for example, English exhibits nine juncture–nexus types. It is important to keep in mind that these juncture–nexus types are abstract linkage relations, not grammatical construction types; each juncture–nexus type may be realized by more than one grammatical construction type in a language. For example, all of the following exemplify core (daughter) subordination in English.

- (6.28) a. That John won the race surprised no one.  
 b. John's winning the race surprised everyone.  
 c. For John to win the race would be the surprise of the year.

In all of these sentences the dependent unit serves as a core argument ('subject') in the main clause, despite the formal diversity among them. Examples of the same formal construction in different juncture–nexus types are given in (6.29).

- |           |   |                         |
|-----------|---|-------------------------|
| (6.29) a. | Kim sat reading a book.   | Core cosubordination    |
| b.        | Dana saw Chris washing the car.   | Core coordination       |
| c.        | Washing the car today would be a mistake.                                   | Core subordination      |
| d.        | Leslie strolled down the street, shouting instructions into his cell phone. | Clausal cosubordination |

In all of these constructions the verb is in the same participial form, but the juncture–nexus combination is different in each sentence. Thus, there is normally not a one-to-one mapping between juncture–nexus types and formal construction types.

Examples of the English juncture–nexus types and the constructions that instantiate them are given in (6.30).

(6.30)	English juncture–nexus combinations	
a.	Max seemed tired. Vince has wiped the table clean.	Nuclear cosubordination
b.	Ted tried to open the door. Sam sat playing the guitar.	Core cosubordination
c.	Louisa told Bob to close the window. Fred saw Harry leave the room.	Core coordination
d.	To wash the car today would be a mistake. Chris regretted dating Pat.	Core subordination (daughter)
e.	Pat went to the party after he talked to Chris.	Ad-core subordination
f.	Pat ran down the hall laughing loudly. Leslie drove to the store and bought some beer.	Clausal cosubordination
g.	Pat told Leslie after the party that she talked to Kim.	Clausal subordination (daughter)
h.	Kim cried, because Leslie didn't call.	Ad-clausal subordination
i.	Anna read for a few minutes, and then she went out.	Clausal coordination
j.	After Anna finished her work, she went to the party.	Sentential subordination
k.	As for Tom, Mary talked to him, but as for Sam, she refused.	Sentential coordination

The examples in (6.1)–(6.30) illustrate the following juncture–nexus types: sentential coordination (6.17), (6.30k); sentential subordination (6.18), (6.19), (6.20b), (6.30j); clausal coordination (6.1a), (6.7), (6.9a), (6.30i); clausal subordination (6.30g); ad-clausal subordination (6.1c), (6.2a), (6.8), (6.11a), (6.24c), (6.30h); clausal cosubordination (6.1b), (6.2b) (6.3)–(6.6), (6.29d), (6.30f); core coordination (6.13a,b,c), (6.29b), (6.30c); core subordination (6.13e), (6.14a,a',b,b',c,c'), (6.28), (6.29c), (6.30d); ad-core subordination (6.23a), (6.24a), (6.26), (6.30e); core cosubordination (6.13d), (6.15a), (6.29a), (6.30b); nuclear cosubordination (6.16), (6.30a); ad-nuclear subordination (6.27a). An English sentence containing three juncture types is given in Figure 6.10 on the next page.

### 6.3 Symmetrical vs asymmetrical linkage

There is a basic principle governing these complex constructions: the unmarked linkage involves units at the same level of juncture, i.e. nucleus with nucleus, core with core, clause with clause, and sentence with sentence. This default may be referred to as 'symmetrical' linkage. A major exception to this is complementation, the use of clauses as core arguments. This results in a larger

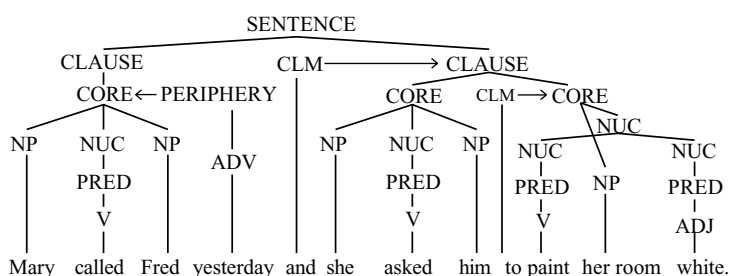


Figure 6.10 English sentence containing clausal, core and nuclear junctures

unit being linked to a smaller unit, i.e. a clause embedded in a core. Such a linkage will be termed ‘asymmetrical’. Languages have means of resolving this asymmetry, namely extraposition. This can be seen with respect to the examples in (6.31); their structures are given in Figure 6.11.

- (6.31) a. That she arrived late shocked everyone. Asymmetrical  
 b. It shocked everyone that she arrived late. Symmetrical

In (6.31a) the embedded clause functions as a core argument, i.e. it is within the core, whereas in (b) it is outside the core and a direct daughter of the higher clause node. Hence in (b) the linkage is symmetrical; it is an example of clausal (daughter) subordination.

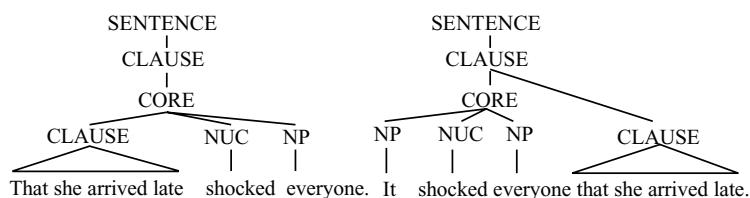


Figure 6.11 Asymmetrical vs symmetrical linkage

Not all instances of complementation lead to asymmetrical linkages of this type. While non-‘subject’ *that*-clauses might appear to be examples of asymmetrical linkage, e.g. (6.14c), they are in fact exceptional, but not in this way. The complement clause does not fill a core argument position, despite being a semantic argument of the matrix verb; rather, it occurs as a direct daughter of the matrix clause node, just as in (6.31b); this is illustrated in Figure 6.12. English does not allow phrasal peripheral elements to occur between two core elements, and consequently because the peripheral PP *after work* occurs between *Pat* and the *that*-clause, the embedded clause must be outside of the core and a daughter of the matrix clause node. Because peripheral<sub>CORE</sub> adjuncts normally occur between the last element of the core and the embedded clause in constructions of this type, the clause must be outside of the core, as in Figure 6.12. While this violates the

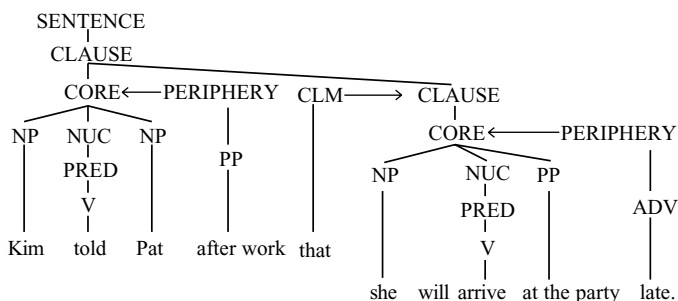


Figure 6.12 *English object complement that-clause*

basic principle that arguments in the logical structure of the verb are realized as core arguments, it does yield a symmetrical linkage. This is the same position that extraposed *that*-clauses appear in, as shown in Figure 6.11. It is another example of a syntax–semantics mismatch: the logical structure of the embedded clause is semantically an argument of the matrix verb, but syntactically it occurs outside of the core. It should be noted that it need not always be the case that object complements of this type are in an extra-core position, but it is the preferred option in many languages, since it yields a symmetrical linkage.

Ad-core subordination in Figure 6.6 is another example of an asymmetrical linkage, since the linked unit, the embedded clause, is contained within a sub-clausal unit, namely the periphery<sub>CORE</sub>. All of the instances of asymmetrical linkage involve subordination; in both coordination and cosubordination, units of the same type must be linked. The most extreme examples of asymmetrical embedding can be found in Wari', a Chapakuran language spoken in Brazil (Everett and Kern 1998). In this language it is possible to embed whole clauses and even sentences within the nucleus of a clause; see Everett (2002) for detailed explication. This type of construction could be considered an example of daughter subordination at the nuclear level, as could the occurrence of auxiliary verbs as in Figure 1.6.

The existence of asymmetrical linkage raises an important question with respect to the characterization of juncture: is the juncture type defined by the level at which the linkage occurs or by the size of the linked unit? In symmetrical linkages the two are the same, and the question does not arise. A comparison of the structures in Figure 6.11 shows that the answer must be the level at which the linkage occurs and not the size of the linked unit. In both of those structures the linked unit is a clause, and therefore to call both of them clausal junctures fails to distinguish them. If, however, juncture is defined in terms of the level at which the linkage occurs, then the two constructions are clearly distinct: the first is a core juncture and the second a clausal juncture. Similarly, the two adverbial clauses in (6.24a) are in different syntactic relationships to the matrix core and clause, and this contrast would be lost if the junctures were defined in terms of the size of the linked unit rather than in terms of where the linkage occurs.



## 6.4 Operators in complex sentences

In the contrasting of clausal cosubordinate linkages with coordinate and subordinate linkages, it was pointed out that the dependent verbs in the cosubordinate examples from Kewa in (6.1b) and from Chuave in (6.2b) also lack inflection for the operators tense and mood (illocutionary force). Cosubordination was described initially as a kind of ‘dependent coordination’, and it is now possible to characterize the nature of the dependence more precisely: *in a cosubordinate linkage at a given level of juncture, the linked units are dependent upon the matrix unit for expression of one or more of the operators for that level*. This is clear in the Kewa example in (6.1b), in the Chuave example in (6.2b), and in the Amele examples in (6.4)–(6.6). It is also found in a more subtle way in the Mparntwe Arrernte examples (Wilkins 1988) in (6.32).

- (6.32) a. Artwe-Ø alye-lhe-me-le petye-me.  
man-NOM sing-DTR-NPP-SS come-NPP  
‘The man is coming singing.’
- b. Artwe-Ø alye-lhe-(me)-rlenge ayenge petye-ke.  
man-NOM sing-DTR-(NPP)-DS 1sgNOM come-PAST  
‘I came while the man was singing.’

Even though both verbs are marked for tense, the absolute tense interpretation for the sentence is a function of the tense marker on the final verb; the tense marker on the verbs bearing switch-reference marking is a relative tense marker, i.e. it is interpreted with reference to the absolute tense of the other verb. Hence even though tense is marked on the first clause in (6.32b), there is nevertheless a tense dependence with the matrix clause. In coordinate nexus, each unit can be (but need not be) independently specified for the relevant operators, as in the Amele examples in (6.6).

This is further illustrated in the following pairs of examples.

- (6.33) a. Roto-mé nipú tá-a pae ake-me nipú tá-a pae? Kewa  
stick-ERG 3sgABS hit-3sgPAST or what-ERG 3sgABS hit-3sgPAST or  
‘A stick hit him, or what hit him?’
- b. Tekeke?e:k šʔa:pa-ta ke-yaše-w! Tonkawa  
in.that.bush hide-SS 1sgOBJ-watch-IMP  
‘Hide in that bush and watch me!’
- (6.34) a. Gid-ip gör-meli-yiz. Turkish  
go-CLM see-MOD-1pl  
‘We ought to go and see.’
- b. Müzik dinle-yerek uyu-yabil-ir-im.  
music listen-CLM sleep-MOD-AOR-1sg  
‘[While] listening to music, I can sleep.’

- (6.35) a. Fu kai fu-one kume-fie va. Barai  
 3sg friend 3sg-POSS call-listen continue  
 'He continued calling and listening for his friend.'
- b. Fu vazai ufu furi numu akoe.  
 3sg grass cut finish pile throw.away  
 'He finished cutting, piled, and threw away the grass.'

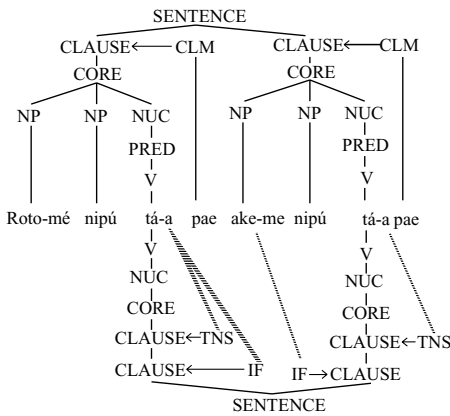
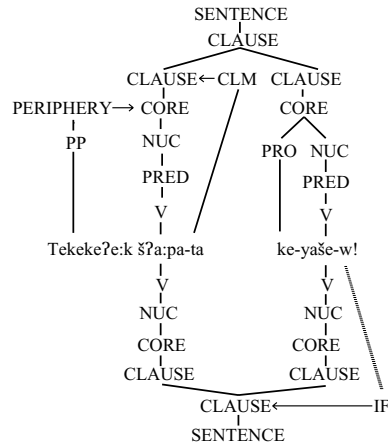
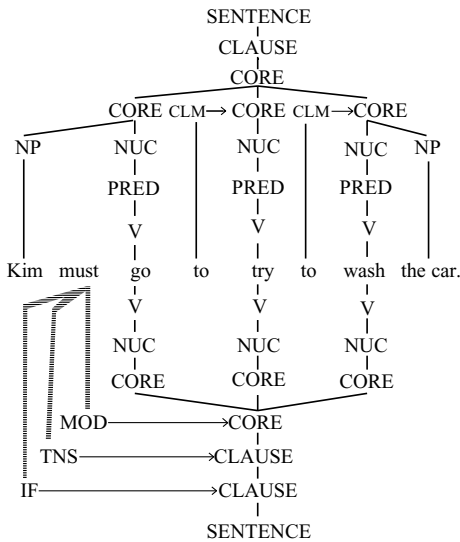
Example (6.33a) illustrates clausal coordination in Kewa, and the two clauses have different illocutionary forces; the first conjunct is an assertion and the second a question. In (6.33b) from Tonkawa (Hoijer 1949), a Native American language, the two clauses are linked by a same-subject marker, and there is only one imperative suffix, appearing on the final verb; both clauses are interpreted as being commands, thereby indicating that the illocutionary force operator has scope over the whole construction, unlike (6.33a). Example (6.33b) is therefore one of cosubordination. In core junctures, illustrated in (6.34) from Turkish (Watters 1993), the relevant operator is modality; all clause-level operators are shared by definition. In (6.34a) the modality operator *-meli* 'should, ought to' modifies both clauses in the construction, indicating that the nexus relation is cosubordination. In (6.34b), by contrast, the modality operator *-ebil* 'ability' has scope only over the core in which it is located. Hence this is a case of coordination at the core level. Finally, the two Barai sentences in (6.35) exemplify nuclear junctures (Olson 1981); in (a) the progressive aspect marker is the verb *va* 'continue', and it modifies both *kume* 'call' and *fie* 'listen', while in (b) the perfective aspect marker, the verb *furi* 'finish', modifies only *ufu* 'cut' and not *numu* 'pile' and *akoe* 'throw away'. This use of verbs in a serial construction as aspectual operators is another example of ad-nuclear subordination. Hence (6.35a) is an example of nuclear cosubordination and (6.35b) nuclear coordination, and both exemplify ad-nuclear subordination.

Examples of RRG projection grammar representations for the Kewa and Tonkawa examples in (6.33) are presented in Figures 6.13 and 6.14, for two kinds of English core junctures in Figures 6.15 and 6.16, for two kinds of Turkish core junctures in Figures 6.17 and 6.18, and for the two Barai nuclear junctures in Figures 6.19 and 6.20.

Because the two Kewa clauses have different illocutionary forces, there is no operator dependence between them, and therefore the nexus is coordinate.<sup>6</sup> This contrasts with the Tonkawa example in (6.33b), in which the imperative illocutionary force operator has scope over both clauses; hence the nexus is cosubordinate, as illustrated in Figure 6.14.

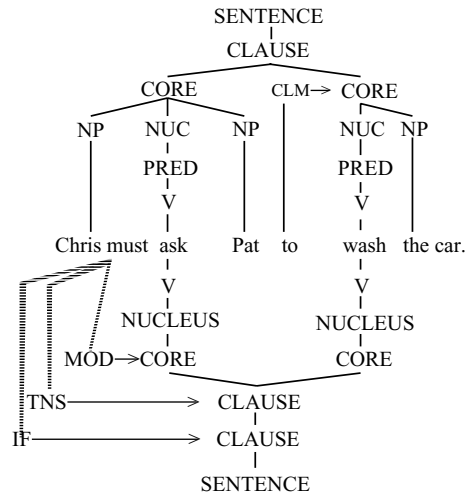
Figure 6.15 below is an example of core cosubordination in English. The fact that *Kim* in Figure 6.15 and *Pat* in Figure 6.16 is an argument of more than one core is captured by the theory of control and the linking algorithm

<sup>6</sup> Kewa has WH -in situ, which is typical for OV languages; hence the WH-word is core-internal and not in a precore slot.

Figure 6.13 *Kewa clausal coordination*Figure 6.14 *Tonkawa clausal cosubordination*Figure 6.15 *English core cosubordination*

to be presented in section 7.3.1. The constituent and operator projections of these two sentences are not the same: the core nodes are dominated by a superordinate core node in cosubordination (Figure 6.15) but not in coordination (Figure 6.16). This reflects the fact that in core cosubordination a core operator such as modality *must* ‘obligation’ is shared by all cores, whereas it is not shared in core coordination.

This is also illustrated in the Turkish examples in Figure 6.17 (= (6.34a)) and Figure 6.18 (= (6.34b)). The different scopes of the modal operators are explicit in these two representations. This follows from the point made at the beginning of this section, namely, that the defining feature of cosubordination in contrast to coordination is the shared operators at the level of juncture.

Figure 6.16 *English core coordination*

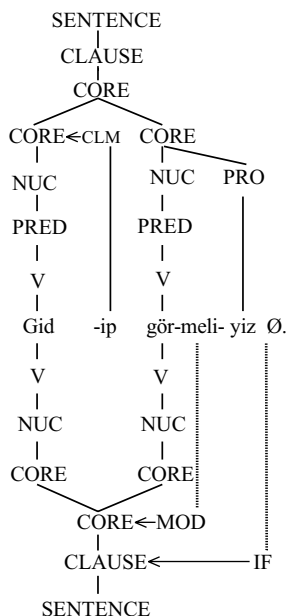


Figure 6.17 Turkish core cosubordination

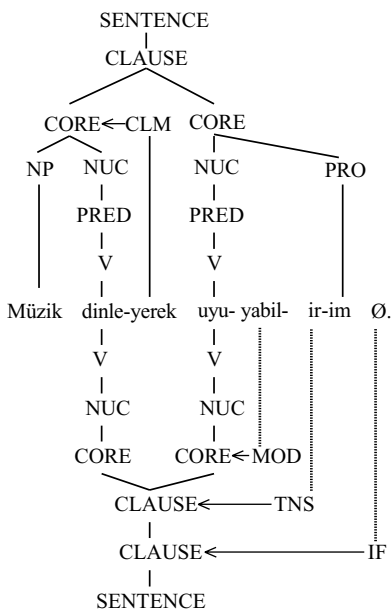


Figure 6.18 Turkish core coordination

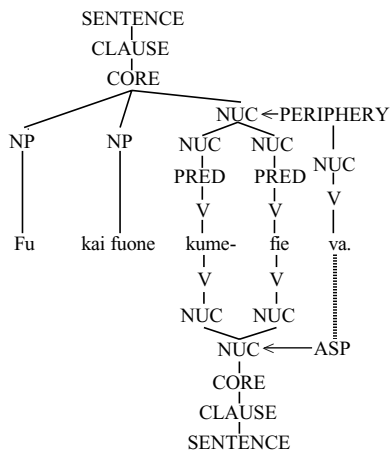


Figure 6.19 Barai nuclear cosubordination

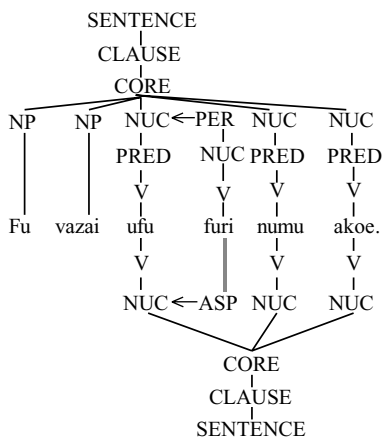


Figure 6.20 Barai nuclear coordination

Finally, the Barai constructions in Figures 6.19 (= (6.35a)) and 6.20 (= (6.35.b)) exemplify all three kinds of nuclear juncture. The essential difference between these two constructions is that the aspectual operator has scope over both nuclei in (6.35a) but over only one of the nuclei in (6.35b), and this is captured in these representations.

There appear to be cases of cosubordination in which operator sharing is possible but not obligatory. Bickel (2003b) presents the following examples of cosubordination from Belhare (Tibeto-Burman) and Nepali (Indo-European), both spoken in Nepal, in which tense may but need not be shared across the two clauses.

- (6.36) a. Kimm-e n-ta-ch-u ki mun n-dhup-chi. Belhare  
 house-LOC 3ns-reach-dl-3sg SEQ 3dl 3ns-chat.NPST-dl  
 ‘They will reach home and chat’, or ‘When they reach home, they’ll chat’,  
 or ‘They reached home and now they will chat.’
- b. Ghar pug-era gāph gar-chann. Nepali  
 house reach-CLM small.talk do-3plNPST  
 ‘They will reach home and chat’, or ‘When they reach home, they’ll chat’,  
 or ‘They reached home and now they will chat.’

In both of these examples, which are translation equivalents of each other, the tense on the final verb may or may not be interpreted as having scope over both clauses, as the different possible translations show. This means that in some languages cosubordination involves possible rather than obligatory operator sharing; Bickel shows that this kind of operator sharing is impossible in coordination and subordination.

Operators are not directly relevant to the determination of subordination, since the crucial defining feature of subordination is embedding, and it is distinguished from the other two nexus types by that feature; this is true of both daughter and peripheral subordination. Cosubordinate constructions exhibit operator dependence, e.g. shared tense and illocutionary force at the clause level, whereas subordinate constructions are structurally dependent, i.e. they serve as arguments or modifiers.

## 6.5 Complementizer position

Complementizers, such as English *that*, are part of a larger class of grammatical markers called ‘clause-linkage markers’, which includes conjunctions and switch-reference markers (see Van Valin and LaPolla 1997: section 8.4.2). They mark the linked unit in a complex construction, and they are treated as functioning on the level of the juncture. Thus in Figures 6.15–6.18 the dependent unit markers, *to* in English and *-ErEk/-Ip* in Turkish, are core-level clause-linkage markers. When the dependent unit is a clause, as in a typical object complement, the marker, e.g. *that* in English, is a clausal complementizer; this is illustrated in Figure 6.12 for English. Many adverbial subordinate clauses are introduced by clause-linkage markers rather than by predicative adpositions which have clausal arguments, as discussed in section 6.2. In the Chuave example in (6.2a), the subordinator *-g-* is not a postposition and would be a kind of clause-linkage marker. This is also true for English subordinators like *because*, *if* and *although*, which are not prepositions. In some languages, case markers serve as clause-linkage markers (see Ohori 1996).

## 6.6 Interclausal semantic relations and the interclausal relations hierarchy

The eleven juncture–nexus types, while purely syntactic, are used to express certain semantic relations between the units in the juncture, e.g. causation,

purpose, and temporal sequence. These interclausal semantic relations are given in (6.37).

- (6.37) Interclausal semantic relations
- a. Causative [1]: the bringing about of one state of affairs directly by another state of affairs, usually an event or action, e.g. (6.16a,b,c).
  - b. Phase: a separate verb describes a facet of the temporal envelope of a state of affairs, specifically its onset, its termination, or its continuation, e.g. *Chris started crying, Fred kept singing, Kim finished writing the chapter.*
  - c. Modifying subevents
    1. Manner: the manner in which a motion event is carried out, e.g. *Bill entered the room skipping.*
    2. Motion: motion accompanying another action, e.g. Mparntwe Arrernte *angk-tyantye-* (speak-go.upwards) 'speak while going up' (Wilkins 1991).
    3. Position: stance while doing an action, e.g. (6.29a).
    4. Means: the means by which an action is carried out, e.g. *Sam opened the box by slicing it with a knife.*
  - d. Psych-action: a mental disposition regarding a possible action on the part of a participant x in the state of affairs, e.g. *Max decided to leave, Sally forgot to open the window, Tanisha wants to go to the movies.*
  - e. Purposive: one action is done with the intent of realizing another state of affairs, e.g. *Juan went to the store to buy milk, Susan brought the book to read.*
  - f. Jussive: the expression of a command, request or demand, e.g. *Pat asked the student to leave, The king ordered the troops to attack the city.*
  - g. Causative [2]: the bringing about of one state of affairs through a distinct action or event, e.g. (6.13a,b,c).
  - h. Direct perception: an unmediated apprehension of some act, event or situation through the senses, e.g. *Rex saw the child open the door, Yolanda heard the guests arrive.*
  - i. Indirect perception: the deduction of some act, event or situation from evidence of it, e.g. (looking at an empty desk) *I see that John has gone home early.*
  - j. Propositional attitude: the expression of a participant's attitude, judgment or opinion regarding a state of affairs, e.g. *Carl believes that UFOs are a menace to the earth, Paul considers Carl to be a fool, Most fans want very much for their team to win.*
  - k. Cognition: an expression of knowledge or mental activity, e.g. *Aaron knows that the earth is round, George is thinking about Madeleine's refusal to go out with him.*
  - l. Indirect discourse: an expression of reported speech, e.g. *Frank said that his friends were corrupt.*
  - m. Direct discourse: the direct quotation of a speech event, e.g. *Frank said, 'My friends are corrupt.'*
  - n. Circumstances: the spatial or temporal parameters of an event, e.g. (6.23a).
  - o. Reason: the motivation or cause for an action or event, e.g. *The baby cried, because she was hungry.*

- p. Conditional: an expression of what consequence would hold, given the conditions in a particular state of affairs, e.g. *If it rains, we won't be able to have a picnic, Were Fred to leave now, he would look like a fool.*
- q. Concessive: the content of the main clause holds unexpectedly, given the content of the subordinate clause, e.g. *Bill made it to work, even though it was snowing heavily.*
- r. Temporal
1. Simultaneous states of affairs: one state of affairs is temporally coterminous with another, e.g. *Max was dancing, and at the same time Susan played the piano.*
  2. Sequential states of affairs: one state of affairs follows another temporally, with or without any temporal overlap, e.g. *Juan finished reading the newspaper; and then Carlos walked into the room.*
- s. Temporally unordered states of affairs: the temporal relation between states of affairs is unexpressed, e.g. *Tyrone talked to Tanisha, and Yolanda chatted with Kareem.*

These relations may be given a formal characterization in terms of the decompositional system introduced in chapter 2, following a suggestion of Ohori (2001). This is presented in (6.38).

(6.38) a.	Causative [1]	... CAUSE ...
b.	Phase	BECOME/INGR, KEEP, TERMINATE
c.	Modifying subevents	
	1. Manner	$\text{do}'(x, [\text{MOTION}'(x)] \dots \wedge [\text{MANNER.OF.MOTION}'(x)])^7$
	2. Motion	$\text{do}'(x, [\text{MOTION}'(x)] \dots \wedge [\text{pred}_2'(x, (y))])$
	3. Position	$\text{do}'(x, [\text{STANCE}'(x)] \wedge [\text{pred}_2'(x, (y))])$
	4. Means	$\text{do}'(x, [\dots] \wedge [\text{pred}_2'(x, (y))])$
d.	Psych-action	$\text{MENTAL.DISPOSITION}'(x, [\text{LS} \dots x \dots])$
e.	Purposive	$\text{want}'(x, \text{LS}_2) \wedge \text{DO}(x, [[\text{LS}_1] \diamond \text{CAUSE} [\text{LS}_2]])$
f.	Jussive	$[\text{do}'(x, [\text{say}'(x, y))]] \text{ CAUSE } [\text{MENTAL.DISPOSITION}'(y, [\text{LS} \dots y \dots])]$
g.	Causative [2]	$[\text{do}'(x, \emptyset)] \text{ CAUSE } [\text{undergo}'(y, [\text{LS} \dots y \dots])]$
h.	Direct perception	$\text{PERCEIVE}'(x, [\text{LS} \dots \underline{y} \dots])$
i.	Indirect perception	$\text{PERCEIVE}'(x, [\text{LS}])$
j.	Propositional attitude	$\text{BELIEVE}'((x, [\text{LS}])$
k.	Cognition	$\text{KNOW}'(x, [\text{LS}])$
l.	Indirect discourse	$\text{do}'(x, [\text{say}'(x, [\text{LS} \langle \text{TNS} \dots \rangle])])$
m.	Direct discourse	$\text{do}'(x, [\text{say}'(x, [\text{LS} \langle \text{IF} \dots \rangle])])$
n.	Circumstances	$\text{be-LOC/TEMP}'([\text{LS}_1], [\text{LS}_2])$
o.	Reason	$[\text{LS}_1] \text{ BECAUSE}' [\text{LS}_2]$
p.	Conditional	$[\text{LS}_1] \supset [\text{LS}_2]$
q.	Concessive	$[\text{LS}_1] \text{ IN.SPITE.OF}' [\text{LS}_2]$
r.	Temporal	$[\text{LS}_1] \wedge [\text{LS}_2]$
		$[\text{LS}_1] \& [\text{LS}_2]$
s.	Situation–Situation	$[\text{LS}_1] + [\text{LS}_2]$

<sup>7</sup> 'VERB'' represents the class of verbs or predicates of this type; hence, e.g., **believe'** represents verbs meaning 'believe', while **BELIEVE'** represents the class of propositional attitude verbs.

A few explanatory notes on these representations are in order. Causative [1] has the same logical structure as a lexical causative verb, e.g. (2.17g), while Causative [2] involves a matrix logical structure, the logical structure of an overt causative verb, and an embedded logical structure, as shown in (6.13a–c). See Jolly (1991, 1993) for an explication of the purposive logical structure. ‘(x, [LS . . . x . . . ])’ means that the participant denoted by *x* is involved in both states of affairs signalled by the matrix and embedded logical structures. ‘(x, [LS . . . y . . . ])’ signals a similar involvement for the participant denoted by the *y* argument, but the relationship is not the same as that in, e.g., (6.38d); rather, it is the same as in the possessor raising logical structure in (5.8) and Figure 5.18. The *x* argument in (6.38j) is optional, because some propositional attitude predicates are one-place and take only a propositional argument, e.g. *be true*, *be false*, *be certain*. The contrast between direct and indirect discourse is signalled by the existence of an illocutionary force operator in the embedded logical structure in direct discourse and by the lack of one in the embedded logical structure in indirect discourse. The symbol ‘+’ signals that the relationship between the two situations is temporally unspecified.

The semantic relations form a continuum expressing the degree of semantic cohesion between the propositional units linked in the complex structure, i.e. the degree to which they express facets of a single action or event or discrete actions or events. This may be represented as in Figure 6.21.

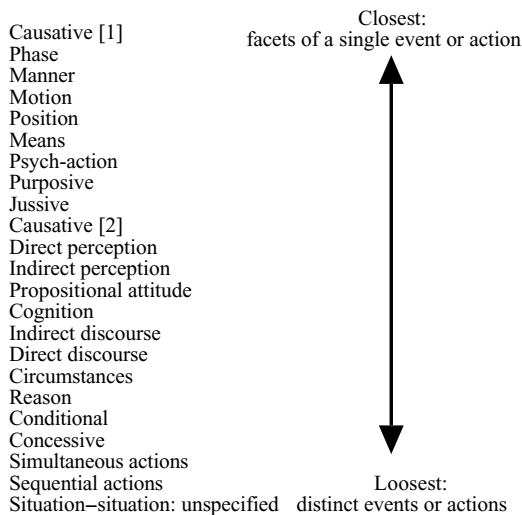


Figure 6.21 *Interclausal semantic relations hierarchy*

The syntactic linkage relations may be ranked hierarchically in terms of the strength of the syntactic bond between the units, i.e. in terms of how integrated the units are into a single unit or how distinctly they are coded as separate units. The interaction of the two hierarchies is expressed in the interclausal relations hierarchy in Figure 6.22. The relationship between the syntactic and semantic



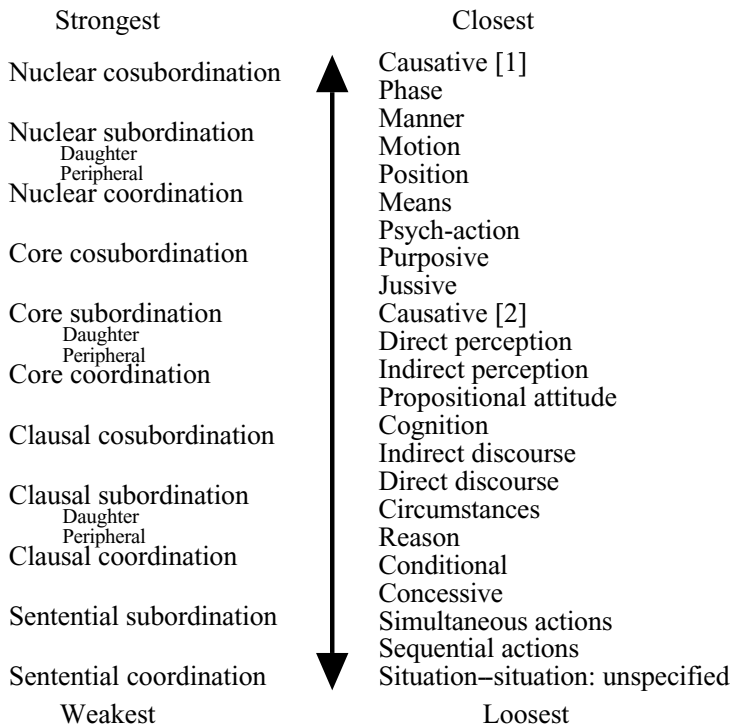


Figure 6.22 *Interclausal relations hierarchy*

relations in clause linkage is very complex, i.e. it is not one-to-one, but there are some striking regularities cross-linguistically. The primary principle governing the interaction of the two hierarchies is: the closer the semantic relation between two propositions is, the stronger the syntactic link joining them. In other words, the semantic relations at the top end of the hierarchy should be realized by the linkage categories at the top as well, and the relations at the bottom of the hierarchy should be realized by the linkage categories at the bottom of the syntactic side. Moreover, while there is often more than one syntactic realization of a particular semantic relation, the tightest syntactic linkage realizing it should be tighter than the tightest syntactic linkage realizing looser semantic relations.<sup>8</sup>

<sup>8</sup> The basic iconic principle governing the syntax and semantics of clause linkage has been pointed out in Silverstein (1976) and Givón (1980). It should be noted that the semantic relations at the top end of the hierarchy are often lexicalized and not realized by a complex syntactic construction, e.g. Causative [1] as in Turkish and Lakhota. In this situation, the tightest syntactic linkage will not instantiate the top semantic relations, but this is not a counterexample to the claims of the interclausal relations hierarchy. Indeed, the fact that it is the strongest semantic relations that are grammaticalized into morphological constructions, replacing the nuclear junctures, follows the basic claim of the interclausal relations hierarchy: the stronger the semantic relation, the tighter the morphosyntactic bond between the units, and the evolution from a tightly bound syntactic construction to an even more tightly bound morphological construction represents a natural extension of the iconic relation between form and meaning expressed in the interclausal relations hierarchy. See Kochelman (2003) for an application of the interclausal relations hierarchy to Q'eqchi' Maya.

A given verb or other predicate may take more than one juncture–nexus type in complex sentences. Some can occur with as many as three juncture–nexus types, e.g. *be likely* and *remember*, as illustrated in (6.39) and (6.40).

- |           |  |                       |
|-----------|--|-----------------------|
| (6.39) a. | That Chris will win the election is likely.    | Core subordination    |
| b.        | It is likely that Chris will win the election. | Clausal subordination |
| c.        | Chris is likely to win the election.           | Core coordination     |
| (6.40) a. | Kim remembered to turn off the light.          | Core cosubordination  |
| b.        | Kim remembered Pat turning off the light.      | Core coordination     |
| c.        | Kim remembered that Pat turned off the light.  | Clausal subordination |

The pattern in (6.40) follows from the semantics of the different constructions (Van Valin and Wilkins 1993). This is illustrated with the following examples with *persuade*.

- |           |   |                        |
|-----------|---|------------------------|
| (6.41) a. | Leslie persuaded Dana to leave.                                   | Psych-action           |
| b.        | Chris persuaded Kim that a quantum theory of gravity is possible. | Propositional attitude |

*Persuade* has two basic senses, very roughly ‘cause to want’ and ‘cause to believe’, and this can be seen most clearly in the way *persuade* is translated into other languages. In Lakota, for example, *persuade* is translated two ways; the first is *č̣ḥi-kḥíya* (want-CAUSE) ‘cause to want’, and the second is *wičákhe-la-khiya* (believe (< *wičákhe-la* ‘true-consider’)-CAUSE) ‘cause to believe’. These meanings are reflected in the logical structures for these sentences in (6.42); **want’** entails a psych-action interclausal relation and **believe’** a propositional attitude interclausal semantic relation.

- |           |   |  |
|-----------|---|--|
| (6.42) a. | <i>persuade</i> [psych-action]:           | [ <b>do’</b> (x, Ø)] CAUSE [ <b>want’</b> (y, [. . .])]    |
| b.        | <i>persuade</i> [propositional attitude]: | [ <b>do’</b> (x, Ø)] CAUSE [ <b>believe’</b> (y, [. . .])] |

In terms of the choice of complement construction used with complement-taking predicates, it has been widely assumed that it is necessary to list the different complement forms a verb takes, yet *persuade* in its psych-action sense takes the same complement form as other psych-action verbs, such as *want*, i.e. a non-subordinate core juncture realized by an infinitive construction (*to* + infinitive), and this follows from the meaning of psych-action: the verb codes a mental disposition on the part of its actor to be involved in a state of affairs (see (6.38d)), and accordingly the actor must also be a semantic argument of the embedded logical structure, because the participant with the mental disposition must also be a participant in the state of affairs denoted by the embedded logical structure. Likewise, in its propositional attitude sense it takes the same complement form as other propositional attitude verbs such as *believe*, i.e. clausal subordination realized by a *that*-clause; the content of the belief is a proposition, and the canonical realization of a proposition is a clause, hence a *that*-construction for the embedded proposition. Thus, using the interclausal relations hierarchy and the semantic representations for *persuade*, it is possible to derive the appropriate complex sentence forms for this verb. This is summarized in Figure 6.23.

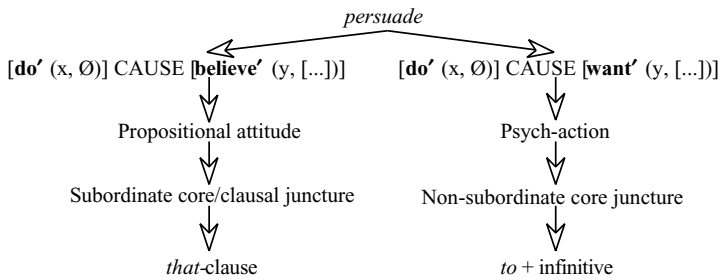


Figure 6.23 Analysis of English persuade complex sentence forms

This analysis makes clear that, given the framework presented in this chapter for the analysis of the syntax and semantics of complex sentences, the juncture–nexus type(s) and complement constructions that a verb takes can be derived from its semantic representation and need not be stipulated in its lexical entry. For the purposes of this discussion, it is sufficient to say that each of the two senses of *persuade* has a distinct but related logical structure. However, Van Valin and Wilkins (1993) argue that, with a more fine-grained decomposition than that presented in chapter 2, it is possible to give a single logical structure for verbs like *persuade* or *remember*, which occur with multiple juncture–nexus types in complex sentences; they give a detailed analysis of the facts in (6.40) from English and their equivalents in Mparntwe Arrernte.

The syntactic side of this hierarchy is much better understood than the semantic side; interclausal semantic relations have been much less investigated in contemporary linguistics than intraclausal semantic relations like thematic relations have been. The relations listed in the hierarchy in Figure 6.21 do not constitute an exhaustive list of possible interclausal semantic relations, and, moreover, this hierarchy is itself the result of combining a number of more basic semantic hierarchies, including (but not limited to) temporal, causal, mental disposition and necessarily shared participant hierarchies. The essential idea is that the semantic cohesion between units expressed in the hierarchy in Figure 6.21 follows from the interaction of a number of factors, each of which is expressed in these hierarchies. Initial approximations of the four hierarchies are given in (6.43)–(6.46).

- (6.43) Temporal hierarchy: phases of a single event > simultaneous events > sequential events > unspecified
- (6.44) Causal hierarchy: physical > verbal > underspecified [non-defeasible] > inferred [defeasible]
- (6.45) Participant's mental disposition: intention > perception > belief > knowledge
- (6.46) Necessarily shared participant hierarchy: Yes > No

In some sense the temporal hierarchy is the most fundamental: actions treated as phases of a single event are by definition going to be closer to each other semantically than actions treated as distinct events. In the causal hierarchy, 'physical' refers to some kind of physical action on the part of the causer on the causee,

whereas ‘verbal’ means that the causer acts on the causee by means of speech; the other two involve no specification of the kind of causality, the difference between the two residing in whether the causation is explicit (underspecified) or not (inferred).<sup>9</sup> The mental disposition hierarchy concerns what kind of cognitive state of a participant is involved, and finally the necessarily shared participant hierarchy says simply that two events which necessarily share a participant are more closely related than two which do not. The interaction of these hierarchies can be seen in the following examples.<sup>10</sup>

- (6.47) a. Harry shot Tom dead.  
       b. Tom died, because Harry shot him.  
       c. Having been shot by Harry, Tom died.  
       d. After Harry shot him, Tom died.  
       e. Harry shot Tom, and he died.

Only in (6.47a) are the shooting and Tom’s dying treated as phases of a single event; this is causative [1] in (6.38a). In some languages this may be expressed by a single verb, e.g. German *erschliessen* ‘shoot to death’, Lakota *wot’a* ‘shoot to death’ [lit. ‘cause to die by action from a distance’]. In all of the other sentences the two are treated as distinct events, with explicit temporal sequences expressed in (c) and (d). The second example is explicit about the causal relationship, but it leaves the temporal parameters unspecified. In (6.47c–e) causality is nothing more than an inference; for example, all would be true of a situation in which Harry shot Tom, Tom survived the shooting but then developed a secondary infection while in the hospital and subsequently died. A case of underspecified causality would be *Harry caused Tom to open the window*; this is causative [2] in (6.38g). Here there is no indication whether the causation, which is explicit, is physical or verbal; it is compatible with both. What is often called ‘direct manipulative causation’ involves physical causality, actions which are phases of a single event and a necessarily shared participant.

The hierarchy concerning a participant’s mental disposition, given in (6.45) is relevant to an additional important distinction in causality, namely the one illustrated in (6.48).

- (6.48) a. Harry made Tom open the window.  
       b. Harry had Tom open the window.

<sup>9</sup> Causality is a huge topic, and ideas from a variety of approaches need to be integrated in a fully fleshed-out causal hierarchy, including Talmy (2000)’s theory of force dynamics. For a detailed study of the interaction between the syntactic and semantic hierarchies, on the one hand, and of the alteration between morphological and syntactic coding, on the other, see Guerrero Valenzuela (2004), an investigation of the syntax and semantics of complex sentences in Yaqui.

<sup>10</sup> These alternative expressions of causality illustrate that the higher a semantic relation is on the interclausal relations hierarchy, the more likely it is that there will be multiple ways to realize it syntactically. That is, the higher the tightest linkage relation realizing a particular semantic relation is, the more looser linkage relations will be available for alternative codings of it. In (6.47), (a) is an example of nuclear cosubordination, (c) is clausal cosubordination, (d) is clausal subordination, and (e) is clausal coordination.

An important aspect of the contrast in (6.48) concerns the mental disposition of the causee: whether he is acting according to his own intention, as in (b), or not, as in (a). This contrast is independent of the physical vs verbal opposition, as the following examples show.

- (6.49) a. Harry ordered Tom to open the window.  
       b. Harry asked Tom to open the window.

Both of these involve verbal causality, i.e. they are jussives, and they differ, as in (6.48), as to whether the causee is acting of his own accord or not.

The psych-action and purposive relations in (6.37) both refer to a participant's intentions; the former expresses a participant's intention or other mental disposition toward an action involving him/her, while the latter conveys a participant's intention to realize some state of affairs by means of an antecedent action. With psych-action there is a mental state and some kind of action, which may or may not temporally overlap. With purposive there are two actions which are necessarily sequential, and the participant's intention relates to both of them; this is normally expressed constructionally, as there is no verb expressing the participant's intention in the construction. Thus in characterizing these two interclausal semantic relations the mental disposition and temporal hierarchies play a role.

The temporal hierarchy is crucial in distinguishing direct from indirect perception, which involves the second value on the mental disposition hierarchy. Direct perception entails that the perceptual event and the event perceived are simultaneous, while indirect perception requires that they not be. Hence in indirect perception the perceptual event necessarily follows the deduced event. The necessarily shared participant hierarchy is relevant, too: in direct perception there is a necessarily shared participant, as indicated in (6.38h), whereas there is none in indirect perception.

Clausal junctures are the building blocks of texts and discourse, and the relations among clauses at the discourse level include those involving discrete events in the temporal hierarchy, as well as the kind of relations that figure prominently in discourse theories like Rhetorical Structure Theory (e.g. Matthiessen and Thompson 1988).<sup>11</sup>

The hierarchies in (6.43)–(6.46) constitute only an initial, tentative step toward decomposing the interclausal semantic relations hierarchy and providing an explanation for the upper two-thirds of it.<sup>12</sup> The lower third overlaps with the semantic relations investigated in theories of discourse structure.

## 6.7 Focus structure in complex sentences

The focus structure projection of a sentence is related to the operator projection, because the nature of the speech act node which anchors the

<sup>11</sup> See Winther-Nielsen (1995) for an analysis of Biblical Hebrew texts which combines the RRG theory of clause linkage with Rhetorical Structure Theory.

<sup>12</sup> See Guerrero Valenzuela (2004) for more discussion of these hierarchies and their interaction.

focus structure projection is expressed by the illocutionary force operator. This has critical implications for the potential focus domain in complex sentences. Illocutionary force cannot be independently specified in a subordinate clause of any kind; only clause nodes immediately dominated by the sentence node can have an illocutionary force operator. However, it is possible for some subordinate clauses to be within the scope of the illocutionary force operator, and therefore to be questioned or asserted (see Erteschik-Shir 1973; Erteschik-Shir and Lappin 1979), i.e. within the potential focus domain, and this brings up the important question of determining which types of subordinate clause can and cannot be within the potential focus domain. Both structural and lexical factors play central roles, and in this section only the structural considerations will be addressed; lexical factors will be discussed in section 7.6.

There is a very general structural constraint governing the potential focus domain in complex sentences, and it is stated in (6.50).

- (6.50) The potential focus domain extends into a subordinate clause if and only if the subordinate clause is a direct daughter of (a direct daughter of) the clause node which is modified by the illocutionary force operator.

In principle, there is no limit to the number of direct daughters involved, and therefore the specification in parenthesis should be considered to be recursive. This constraint can be illustrated in the contrast between Figures 6.12 and 6.6. In Figure 6.12, the subordinate clause is a direct daughter of the clause which is directly dominated by the sentence node; this is true in both the constituent and operator projections. Consequently, both clauses are in the potential focus domain in Figure 6.12, and this is represented in Figure 6.24. As in the figures in chapter 3,

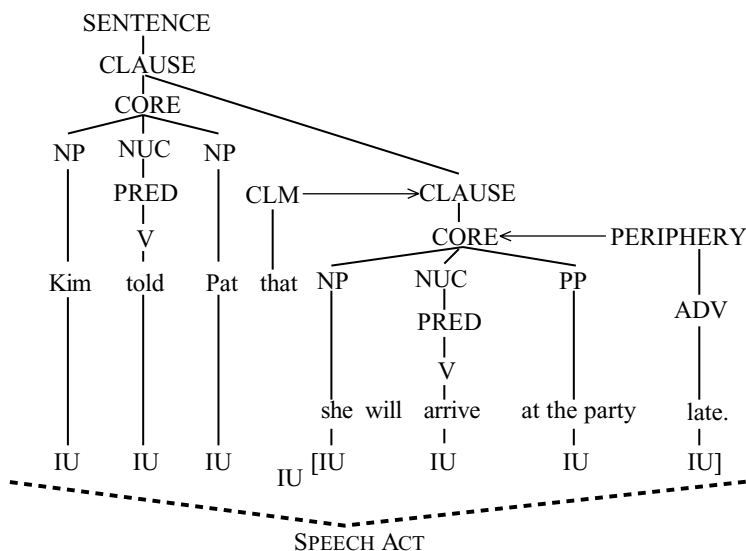


Figure 6.24 *Potential focus domain in clausal (daughter) subordination*

the dotted line represents the potential focus domain, and ‘IU’ indicates the basic information units. A significant property of this construction is that there are two ways the embedded clause can be interpreted in information-structure terms. The subordinate clause as a whole may function as a single information unit, since it can be replaced by a WH-word, e.g. *What did Kim tell Pat*, or the elements inside of it may also be interpreted as distinct information units, because the potential focus domain extends into the subordinate clause. Evidence that the potential focus domain extends into it comes from possible answers to yes–no questions. In order to be the focus of a question (i.e. in the actual focus domain), an element must be in the potential focus domain, since only elements within the potential focus domain have the possibility of being in the actual focus domain. Consider the following question–answer pair.<sup>13</sup>

- (6.51) Q: Did Kim tell Pat that he will arrive at the party *LATE*?  
 A: No, *EARLY*.

It is possible for the focus of the yes–no question to fall on the subordinate clause peripheral adverb *late*, as the felicity of the response denying *late* and asserting *early* shows. Hence the subordinate clause must be in the potential focus domain, because in the question in (6.51) the actual focus domain is in the subordinate clause.

In Figure 6.6, on the other hand, the subordinate clause bears no direct relationship to the matrix clause; it is the core argument of the predicative preposition *after*, and the PP is part of the periphery<sub>CORE</sub> of the clause; in the operator projection, the clause is represented as an adjunct modifier of the core of the matrix clause. It is not a direct daughter of the matrix clause node. Hence the potential focus domain does not extend beyond the matrix clause (including the PP as a whole), and this is represented in Figure 6.25 on p. 216. The ad-core subordinate clause as a whole functions as a single information unit within the main clause and can be replaced by a WH-word, e.g. *When did Pat see Kim?*; its internal constituents are not, however, encompassed within the potential focus domain. This can be seen in the question–answer pairs in (6.52).

- (6.52) Q: Did Pat see Kim, after she arrived at the party late?  
 A: a. No, Sally.  
     b. No, before.  
     c. ??No, early.

The infelicity of the (c) response, in sharp contrast to the answer in (6.51), shows that the potential focus domain does not include the constituents of the ad-core subordinate clause. *After* can be the focus of a yes–no question, because it is part of the peripheral PP in the main clause. The principle in (6.50) correctly predicts

<sup>13</sup> This test involves question–answer pairs in which the answer consists of ‘No’ plus a single constituent representing a single information unit. This single constituent is the focus in the answer and corresponds to the focus constituent in the question.

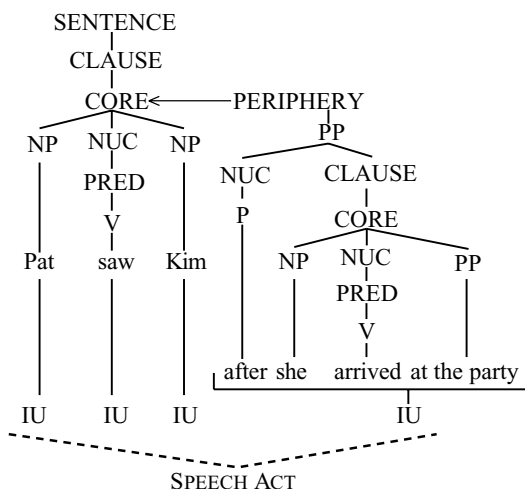


Figure 6.25 *Potential focus domain in ad-core subordination*

that the *that*-clause in (6.51) is included within the potential focus domain and that the internal constituents of the ad-core clause in (6.52) are not.

As with focus structure in simple sentences (see section 3.3), some languages overtly mark whether a clause in a complex sentence is within the potential focus domain or not, e.g. German (see Van Valin 1998). What kind of evidence can be used to show whether an embedded clause is contained within the potential focus domain or not, in a language without such overt marking? One example is whether a constituent can be the focus of a yes–no question as indicated by the felicity of a single constituent response, as in (6.51) and (6.52). Another type of evidence involves the distribution of focus-sensitive elements. For example, if a language has overt focus particles marking NPs in focus, then their distribution in embedded clauses would be a telling indicator of whether the potential focus domain extends into embedded clauses. If they can occur in a particular type of embedded clause with their focus-marking function, that is evidence that that clause type is within the potential focus domain. A clear example of this can be found in Lakhota.

The relevant focus-sensitive element in Lakhota is a set of indefinite articles which are non-referential (non-specific); they can occur in only three contexts: in the scope of the question particle *he*, in the scope of negation, and in the scope of the ‘future tense’ morpheme *-kte* (Williamson 1984). The question operator will be used in this discussion; it occurs sentence-finally, as shown in (5.40) in section 5.4.3. This is illustrated in (6.53).

- (6.53) a.   Hokšíla eyá                   thaló ki   ma-Ø-Ø-nú-pi.<sup>14</sup>  
           boy       some [+SPEC] meat the INAN-3A-steal-pl

<sup>14</sup> The Lakhota verbs *manú* ‘steal’, *wgyáke* ‘see’, *iyúkčq* ‘think’ and *ikíčiču* ‘get for’ in (6.53)–(6.57) take their actor and undergoer markers as infixes.



- <sup>15</sup> Lakhotia relative clauses are internally headed, and the head inside the relative clause is obligatorily marked indefinite, with its actual definiteness value signalled by the article + demonstrative at the end of the relative clause.



- b. Wičháša ki [[šúka wə igmú eyá wičháxaxtake] ki le] wəyáka he?  
 man the dog a cat some [+SPEC] bite the this see Q  
 'Did the man see the dog which bit some cats?'  
 –Hiyá, wəyákešni.  
 no, see.NEG  
 'No, he didn't see it.'  
 –Hiyá, wíyá ki (wəyáke).  
 woman the (see)  
 'No, the woman (saw it).'
- Hiyá, mathó wə (wəyáke).  
 bear a (see)  
 'No, (he saw) a bear.'
- \*Hiyá, magá eyá (wičháxaxtake).  
 duck some (bite)  
 \*'No, (it bit) some ducks.'
- c. [Wičháša ki wóte] ečhúhə, tha-wíču ki mní ikíčiču he?  
 man the eat while his-wife the water get.for Q  
 'While the man was eating, did his wife get him water?'  
 –Hiyá, Fred (mní ikíčiču/\*wóte).  
 'No, Fred (got it for him)', or 'No, (she got it for) Fred'  
 \*'No, Fred was eating.'

In (a) the embedded clause is an object complement, and as the potentially appropriate response indicates, focus may fall within the embedded clause, since it is felicitous to deny the subject NP of the complement in the response. (Note the switch from *etá* in the question to *eyá* in the answer.) This is further evidence in support of the conclusion reached above. In (b) the embedded clause is a definite restrictive relative clause. As always in this language, it is possible for the focus to fall on all of the matrix clause elements, including the NP interpreted as the head of the relative clause, but as the last response shows, it is impossible for an element within the relative clause to be the focus of the question. The final example involves an ad-core subordinate clause, and as the range of potential responses indicates, an element within the subordinate clause cannot be the focus of the question. Thus while the focus can fall on any major element of the matrix clause, it cannot fall within the embedded clause if it is a definite restrictive relative clause or ad-core subordinate clause, and this confirms the conclusion based on the distribution of the indefinite articles in these same constructions.

The potential focus domain in these Lakota constructions is summarized in (6.58).

- (6.58) Summary of potential scope of *he*: potential focus domain [in boldface]
- [Hokšíla **etá thaló ki manúpi**] iyúkčə he?
  - Wičháša ki [[šúka wə igmú eyá wičháxaxtake] **ki le**] wəyáka he?
  - [Wičháša ki wóte] ečhúhə, **tha-wíču ki mní ikíčiču** he?

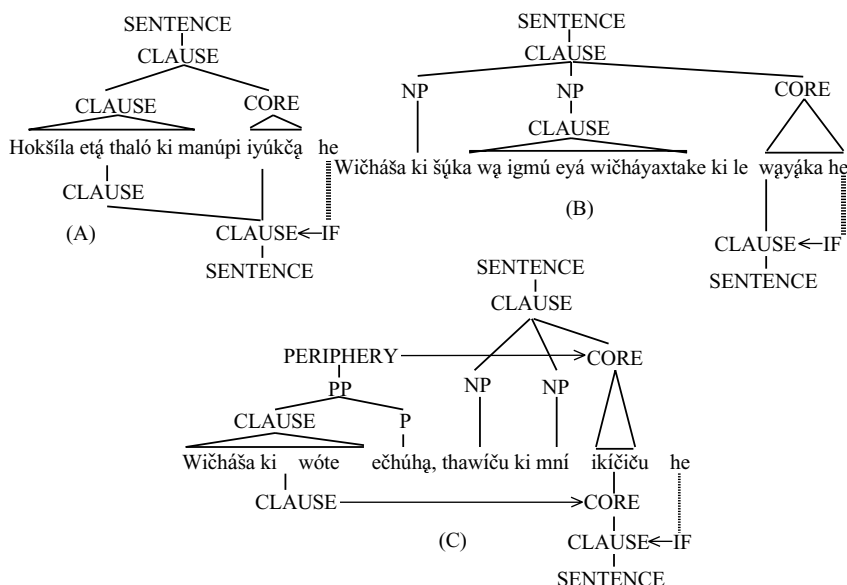


Figure 6.26 *The structure of Lakhota complex sentences in (6.58)*

Does the principle in (6.50) predict this distribution of the potential focus domain in Lakhota? As can be seen from the simplified representations of these constructions in Figure 6.26, the answer is ‘yes’. The (A) diagram in this figure represents (6.58a), in which the embedded clause is a direct daughter of the clause node modified by the illocutionary force operator. As predicted, the potential focus domain extends into the embedded clause. The (B) diagram is the restrictive relative clause in (6.58b), and because the clause is embedded inside a NP, there is no relationship at all between the embedded clause and the clause node modified by the illocutionary force operator. Accordingly, the principle in (6.50) correctly predicts that the constituents of the embedded clause are outside of the potential focus domain. Finally the (C) diagram represents the ad-core subordinate clause in (6.58c), and as in the English ad-core subordinate clause discussed earlier, the embedded clause is an adjunct modifier of the core and not a direct daughter of the clause node modified by the illocutionary force operator. Hence, the principle in (6.50) correctly predicts that the internal constituents of the embedded clause are not within the potential focus domain. Thus, the distribution of *eyá* and *etá* in Lakhota, the second of which must occur in the potential focus domain, is correctly predicted by the principle in (6.50).

## 6.8 Complex NPs

Relative clauses and noun complement constructions have not been discussed, because the theory of clause linkage applies to the joining of clauses and

subclausal units with each other; these constructions involve the linking of a clause with a nominal head. However, the concepts from the theory of clause linkage can be extended to provide a framework for their analysis. This is summarized in Table 6.1. See Van Valin and LaPolla (1997: section 8.6) for detailed discussion.

Table 6.1 *Juncture and nexus in the NP*

Level of juncture	Nexus type(s)	Example
NP	Coordinate	<i>the tall woman and the happy man</i>
	Cosubordinate	<i>the tall woman and happy man</i>
	Subordinate	<i>Chris, who loves soccer</i>
Core <sub>N</sub>	Cosubordinate	<i>the order from the general to attack the city</i>
	Subordinate	<i>the rumour that Fred saw a UFO</i>
Nuclear <sub>N</sub>	Cosubordinate	<i>duckhunter, woodchopper</i>
	Subordinate	<i>the woman who left the party early</i>

Noun complement constructions like *the rumour that Fred saw a UFO* involve a clause as a core argument of a nominal nucleus; this may be represented as in Figure 6.27. Hence it would be an example of core<sub>N</sub> subordination. Restrictive relative clauses in a language like English, on the other hand, are non-argument, i.e. peripheral, modifiers of the nominal; it was argued in section 1.6 that restrictive modifiers occur at the nuclear level. Hence it is an example of nuclear<sub>N</sub> subordination. This is represented in Figure 6.28.

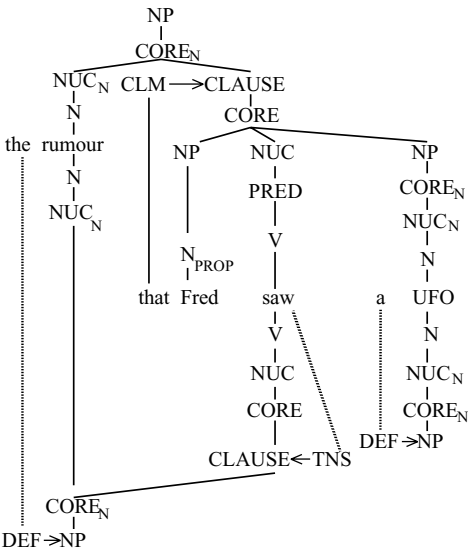


Figure 6.27 *Noun complement that-clause*

Non-restrictive relative clauses have the same internal structure as restrictive relatives, but their structural relationship to the head noun is different. First, they are set off by a pause in languages like English, whereas restrictive relatives are

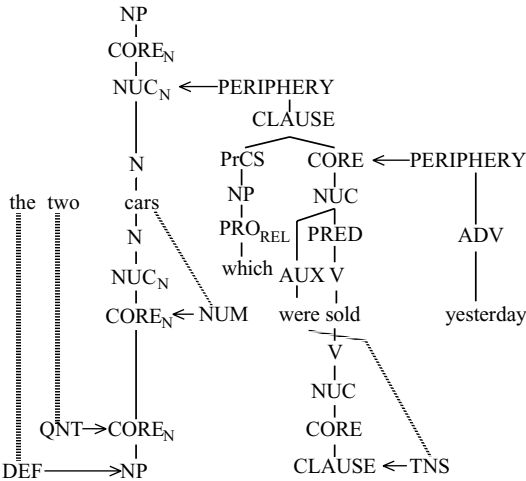


Figure 6.28 *English restrictive relative clause*

not. Second, as the name implies, they are not restrictive modifiers; their information content is additional information about the head noun, not information used by the interlocutor to determine the reference of the head noun. Third, since they often occur with proper nouns, which normally lack a layered structure, they cannot be in the periphery modifying the nominal nucleus, as in Figure 6.28. Hence they must be adjuncts at the NP rather than the nuclear<sub>N</sub> level. The structure of *Chris, who loves soccer*, is given in Figure 6.29. An important difference between restrictive and non-restrictive relative clauses is that non-restrictives

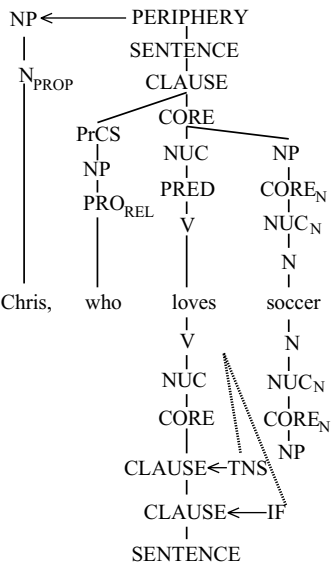


Figure 6.29 *Structure of English non-restrictive relative clause*

are embedded *sentences*, not clauses, because they have a distinct illocutionary force operator from the matrix clause. It is obligatorily declarative, since a non-restrictive relative is an assertion about the head noun. Appositive XPs, e.g. *Chris, a soccer lover*, or *Tom Smith, 81*, are in the same relation to the head noun as non-restrictive relatives.

## 6.9 Syntactic templates for complex sentences

The notion of ‘syntactic template’ was introduced in the discussion of the syntax of simple sentences in chapter 1, and syntactic templates are also relevant to the analysis of complex sentences. Certain complex constructions can be handled in terms of the templates introduced in chapter 1, whereas others require new templates specific to them. The constructions for which no special templates would be required involve subordination, both daughter and peripheral. In core subordination, for example, a core or a clause functions as a core argument, and all that needs to be stated is that a node in a core can be filled by core or a clause, as in Figure 6.11. Nothing special needs to be specified for peripheral subordination involving ad-core and ad-clausal subordinate clauses, as in Figure 6.8. In the case of ad-core peripheral subordination, there is a predicative preposition in the *periphery*<sub>CORE</sub> which takes a clause rather than a simple NP as its argument; the basic template for the matrix clause is the same regardless of whether the argument of the preposition is an NP or a clause. Ad-clausal subordinate clauses in the *periphery*<sub>CLAUSE</sub> are marked by a clause-linkage marker rather than a preposition. Ad-nuclear modifying nuclei, as in Figure 6.9, involve a nucleus occurring in the *periphery*<sub>NUCLEUS</sub>. In order to accommodate these constructions, it would be necessary to specify that clauses and nuclei, as well as PPs and adverbs, can occur as peripheral constituents.

Clausal subordination involving ‘object complements’ (e.g. *that*-clauses), as in Figure 6.12, would require a specific template, which is given in Figure 6.30, because of the occurrence of a clause node as a direct daughter of a clause node. This template can iterate, with the whole template replacing the embedded clause node, producing a sequence of embedded complement clauses, as in *Kim says that Chris thinks that Dana knows that Pat claims that Robin denies . . .*

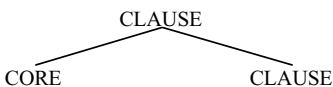


Figure 6.30 Template for clausal (daughter) subordination

There are general templates for coordination and cosubordination, independent of the level of juncture. They are given in Figure 6.31. The essential difference between the two templates is that in coordination the linked units are daughters of a node of the next highest layer of the clause, whereas in cosubordination they

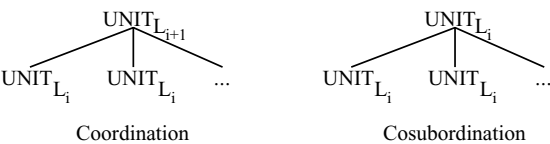


Figure 6.31 *Templates for non-subordinate nexus types*

are daughters of a node of the same layer of the clause. This is true at all levels of juncture.

Chomsky has often pointed out the human languages contain a potentially infinite set of sentences and achieve this with a finite set of mechanisms. In RRG, this aspect of linguistic creativity is captured by the theory of complex sentences: nuclei, cores, clauses and sentences can be combined recursively by means of the different nexus types to create the range of sentences that constitute a human language.



## 7 Linking syntax and semantics in complex sentences

### 7.0 General considerations

In this chapter the linking between semantic representations and syntactic representations in complex sentences is explored. An important question to be investigated is the extent to which the linking algorithms proposed in chapter 5 for simple sentences must be modified to deal with complex sentences. Most complex sentences pose no particular difficulties for the linking system developed in chapter 5. Clausal junctures, for example, are composed of clauses, each of which links like an independent clause. Moreover, nuclear junctures act for linking purposes like simple clauses containing a complex predicate, and they basically follow the algorithms for simple sentences. The real challenge comes from non-subordinate core junctures with their obligatory sharing of a core argument, as discussed in section 6.2. Accordingly, linking in clausal and nuclear junctures will be examined first. After the discussion of linking in the different juncture–nexus types and in complex NPs, reflexivization in complex constructions will be investigated, and again the question arises as to the extent to which the principles proposed in section 5.3 will have to be modified to deal with these new phenomena. In the final section an account of the restrictions on so-called ‘long-distance dependencies’ involved in WH-question formation, topicalization and relativization will be proposed. These restrictions, which fall under the principle known as ‘subjacency’ in the generative literature, are significant for linguistic theory, for theories of language acquisition and for related theories of cognitive organization.

#### 7.0.1 The semantics-to-syntax linking algorithm

The algorithm for linking semantic representations to syntactic representations for simple sentences which was developed in chapter 5 is repeated below.

- (7.1) Linking algorithm: semantics  $\rightarrow$  syntax
1. Construct the semantic representation of the sentence, based on the logical structure of the predicator.
  2. Determine the actor and undergoer assignments, following the actor–undergoer hierarchy in Figure 4.4.
  3. Determine the morphosyntactic coding of the arguments

- a. Select the privileged syntactic argument, based on the privileged syntactic argument selection hierarchy and principles in (4.14)–(4.15).
- b. Assign the arguments the appropriate case markers and/or adpositions.
- c. Assign the agreement marking to the main or auxiliary verb, as appropriate.
4. Select the syntactic template(s) for the sentence following the principles in (5.2).
5. Assign arguments to positions in the syntactic representation of the sentence.
  - a. Assign the [–WH] argument(s) to the appropriate positions in the clause.
  - b. If there is a [+WH] argument of a logical structure,
    1. assign it to the normal position of a non-WH-argument with the same function, or
    2. assign it to the precore or postcore slot, or
    3. assign it to a position within the potential focus domain of the clause (default = the unmarked focus position).
  - c. A non-WH argument may be assigned to the precore or postcore slot, subject to focus structure restrictions (optional).
  - d. Assign the [–WH] argument(s) of logical structure(s) other than that of the predicator in the nucleus to
    1. a periphery (default), or
    2. the precore or postcore slot, or
    3. the left- or right-detached position.

### 7.0.2 The syntax-to-semantics linking algorithm

The algorithm for linking syntactic representations to semantic representations for simple sentences which was developed in chapter 5 is repeated below.

(7.2) Linking algorithm: syntax → semantics

1. Determine the macrorole(s) and other core argument(s) in the clause.
  - a. If the verb is intransitive, then assign the privileged syntactic argument either macrorole or direct core argument status, depending upon the language (language-specific)
  - b. If the verb is transitive and the language lacks voice oppositions, determine the macroroles from case marking and/or word order (language-specific).
  - c. If the language has a voice opposition, determine the voice of a transitive verb (language-specific):
    1. If the construction is syntactically accusative:
      - a. If it is the unmarked voice, the privileged syntactic argument is actor.
      - b. If it is passive, the privileged syntactic argument is not the actor of the predicate in the nucleus;
        1. the actor may appear as a direct core argument (language-specific); or

2. the actor may appear in the periphery<sub>CORE</sub> marked by an adposition or an oblique case (language-specific); or
  3. if there is no actor in the core or the periphery, then replace the variable representing the highest ranking argument in the logical structure with 'Ø'.
2. If the construction is syntactically ergative:
    - a. If it is the unmarked voice, the privileged syntactic argument is undergoer.
    - b. If it is antipassive, the privileged syntactic argument is actor;
      1. the undergoer may appear as a direct core argument or as an oblique element (language-specific);
      2. if there is no undergoer in the core or the periphery<sub>CORE</sub>, then replace the variable representing the lowest ranking argument in the logical structure with 'Ø'.
  3. Assign macrorole status to the other direct core argument, if it is not dative or in an oblique case (language-specific).
  - d. If the language is head-marking and there are independent NPs in the clause, associate each NP with a bound argument marker (language-specific).
2. Retrieve from the lexicon the logical structure of the predicate in the nucleus of the clause and with respect to it execute step 2 from (7.1), subject to the following proviso:
    - a. If the language allows variable undergoer selection and if there is more than one choice for undergoer, do not assign undergoer to an argument in the logical structure.
    - b. Determine the linking of the non-macrorole core argument:
      1. If there is a two-place state predicate in the logical structure and if the non-macrorole core argument is marked by a locative adposition or dative or a locative-type case, then link it with the first argument position in the state predicate in the logical structure and link the other non-actor core argument (if there is one) to the second argument position in the state predicate, or
      2. If there is a two-place state predicate in the logical structure and if the non-macrorole core argument is not marked by a locative adposition or dative or a locative-type case, then link it with the second argument position in the state predicate and link the other non-actor core argument (if there is one) to the first argument position in the state predicate.
      3. Otherwise, link the animate NP with the first argument position in the state predicate in the logical structure.
  3. Link the arguments determined in step 1 with the arguments determined in step 2 until all core arguments are linked.
  4. If there is a predicative adpositional adjunct, then retrieve its logical structure from the lexicon, insert the logical structure of the core as the second argument in the logical structure and the object of the adposition as the first argument.
  5. If there is an element in the pre- or postcore slot (language-specific),

- a. Assign it the remaining unlinked argument position in the semantic representation of the sentence.
- b. And if there are no unlinked argument positions in the sentence, then treat the WH-word like a predicative preposition and follow the procedure in step 4, linking the WH-word to the first argument position in the logical structure.

## 7.1 Linking in clausal junctures

Since clausal junctures are made up of clauses, their linking properties are for the most part determined by the linking properties of the constituent clauses. Consider the following two examples of clausal juncture.

- (7.3) a. Dana jogged through the park, and Kim waved to him.  
 b. Bill went for a run, because he needed some fresh air.

In the first example, *Dana jogged through the park* and *Kim waved to him* are distinct clauses, and each is linked independently of the other, just as if each were a simple sentence on its own. The fact that there is a pronoun in the second clause referring (possibly) to *Dana* in the first clause does not affect the linking. The same is true in the (b) example, which involves peripheral subordination at the clause level; in it each clause links separately. A simplified logical structure for (b) is given in (7.4) (cf. (6.38o)).

- (7.4) [Bill went for a run] **BECAUSE'** [he needed some fresh air]

There is nothing in the linking algorithm in (7.1) which correctly assigns *because he needed some fresh air* to the periphery<sub>CLAUSE</sub>. This is not because this is a complex sentence; rather, it is because all of the adjuncts linked by the semantics-to-syntax algorithm in chapter 5 were ad-core adjunct PPs. There are ad-clausal PP adjuncts: if reason and concessive clauses occur in the periphery<sub>CLAUSE</sub>, then the corresponding reason and concessive adjunct PPs, e.g. (6.25a,b), should be in it, too. Consequently, step 5d1 in (7.1) is inadequate, for both simple and complex sentences. It may be revised as follows.

- (7.5) Revision of step 5d1 in (7.1)
- d. Assign the argument(s) or logical structure in logical structure(s) other than that of the predicator in the nucleus to
    1. a periphery (default)
      - a. If the representation is **pred'** (NP/LS, LS<sub>MAIN</sub>), where **pred'** is a prepositional predicate, then assign the P + NP/Core/Clause to the periphery<sub>CORE</sub>.
      - b. If the representation is LS<sub>MAIN</sub> **pred'/CONNECTIVE'** NP/LS, then assign the P + NP or CLM + Clause to the periphery<sub>CLAUSE</sub>.

This says that if the semantic representation is like (6.38n), then the predicative preposition plus its object, be it an NP, a core or a clause, is an ad-core modifier and is assigned to the periphery<sub>CORE</sub>. If, on the other hand, the semantic representation is like (6.38o–q) or the corresponding representation involving the predicative prepositions *because of* and *despite*, then the resulting adjunct PP or clause is linked to the periphery<sub>CLAUSE</sub>.

Step 4 in the syntax-to-semantics algorithm in (7.2) also needs revision, since it only deals with ad-core adjuncts. It can be reformulated as follows.

- (7.6) Revision of step 4 in (7.2)
4. If there is an adjunct phrase in a periphery,
    - a. and if it is in the periphery<sub>CORE</sub>, then retrieve the logical structure of the predicative adposition from the lexicon, insert the logical structure of the core as the second argument in the logical structure and the object of the adposition as the first argument;
    - b. and if it is in the periphery<sub>CLAUSE</sub>, then link the adjunct PP or clause logical structure to the matrix logical structure via the semantic representation of the adposition or clause-linkage marker.

The rule in 4a yields a representation like (6.38n), while 4b results in a representation like those in (6.38o–q).

An interesting issue is raised by sentences like the one in (7.7).

- (7.7) Kim<sub>i</sub> worked on the assignment in the morning and —<sub>i/\*j</sub> will finish it in the afternoon.

Clausal junctures such as this are found in English topic chains like (4.17a) and in the Tepehua topic chain in (4.22). The traditional name for them in the syntax literature is ‘conjunction reduction’. The logical structure for (7.7) is given in (7.8).

- (7.8) [be-in’ (morning, [(do’ (Kim<sub>i</sub>, [work.on’ (Kim<sub>i</sub>, assignment)]))])] &  
[be-in’ (afternoon, [[do’ (x<sub>i</sub>, Ø)] CAUSE [BECOME finished’ (3sgN)]])]

Only highly topical elements can receive zero coding, and therefore from the point of view of focus structure, constructions like (7.7) involve conjoined predicate-focus or narrow focus constructions in which the privileged syntactic arguments, which are pragmatic controllers and pivots, are topics (see (4.17)–(4.21)). The juncture–nexus type of this construction is clausal cosubordination, because illocutionary force must be shared across all conjuncts. This is illustrated in (7.9).

- (7.9) a. \*Did Kim work on the assignment in the morning, and will finish it in the afternoon?  
b. \*Kim worked on the assignment in the morning, and will finish it in the afternoon?

In the first example, only the first conjunct is questioned, and the result is ungrammatical, while in the second, only the second conjunct is questioned, which is

likewise ungrammatical. The whole sentence must be interpreted as either an assertion or a question, and the most felicitous way to question it is *Is it the case that Kim worked on the assignment in the morning and will finish it in the afternoon?* The constituent structure representation of (7.7) is given in Figure 7.1. There is no core-initial NP position in the second clause, because the argument position in the logical structure containing what would be the privileged syntactic argument is occupied by a lexically unfilled variable obligatorily coindexed with the privileged syntactic argument of the previous logical structure. Because the referent of this variable is recoverable from the construction as a whole, the completeness constraint is not violated.

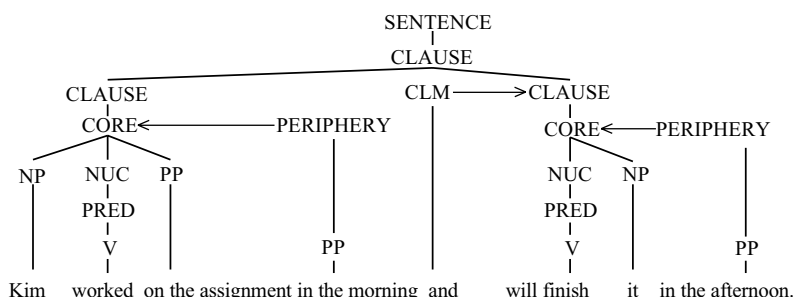


Figure 7.1 *Constituent projection for (7.7)*

Since this is a clausal juncture, each of the clauses links separately, but the construction as a whole imposes a constraint on the linking in the non-initial conjuncts: the argument obligatorily controlled by the privileged syntactic argument of the previous clause must be selected as the privileged syntactic argument of its clause, even though it is not lexically instantiated (see section 4.3).<sup>1</sup> This is captured in the constructional schema for this construction, which is given in Table 7.1 on p. 231. There are a number of new features in constructional schemas for complex sentences. First, there are specifications of the juncture type and the nexus type. Second, there is a specification of the construction type, with an abstract representation of its criterial features. In this case it is the occurrence of no privileged syntactic argument in the non-initial conjuncts and the obligatory coreference with the initial pragmatic controller. This requires that the semantic representation of each non-initial clause contains a lexically unfilled, obligatorily coindexed argument. ‘Unit template(s)’ refers to the template selection principles in (5.2) as well as any special properties of the syntactic templates of the constituent clauses, and special linking requirements are also specified.

The schema in Table 7.1 may appear to be overly specific in many respects, but it is in fact very general and also represents the essential features of the analogous construction in Tepehua in (4.22). Comrie (1988) discusses this construction in

<sup>1</sup> This construction is not a candidate for the discourse representation theory-based analysis proposed in section 5.4.1, because the antecedent of the pivot of the non-initial clause must be contained in the previous syntactically linked clause, regardless of the larger discourse context. Hence this antecedent (controller) is syntactically determined.

Table 7.1 *Constructional schema for English 'conjunction reduction'*

## CONSTRUCTION: English conjunction reduction

## SYNTAX:

Juncture: clausal

Nexus: cosubordination

Construction type: conjunction

[CL [CORE NP<sub>i</sub> [NUC . . .] . . .] . . .]<sub>1</sub>, [CL [CORE—i [NUC . . .] . . .] . . .]<sub>2</sub>, . . . CLM[CL [CORE—i [NUC . . .] . . .] . . .]<sub>n</sub>

Unit template(s): (5.2)

PSA: Clause 1: variable syntactic controller = pragmatic controller

Clause 1 + n: variable syntactic pivot = pragmatic pivot

Linking: controlled argument in clause 1 + n = pragmatic pivot (4.15a, c2)

## MORPHOLOGY:

CLM: coordinating conjunction or disjunction

## SEMANTICS:

Sequence of events sharing a common primary topical participant

## PRAGMATICS:

Illocutionary force: shared across all conjuncts

Focus structure: predicate focus in all conjuncts

Slavic languages like Croatian, which is a so-called 'pro-drop language' (see section 1.6), and shows that for coreference purposes it behaves like the English and Tepehua constructions. Hence it would appear that this schema would apply to these languages as well. Thus, the constructional schema in Table 7.1 can be taken to be the general schema underlying 'topic chains' in languages.

In the construction in (7.7), the default focus structure is predicate focus, and the construction requires highly topical pragmatic privileged syntactic arguments. There is another clausal juncture construction in which the focus structure is just the opposite; that is, in this construction the privileged syntactic argument in the second clause must be focal and the remainder of the second clause must be non-focal. Traditionally called 'VP ellipsis', it is exemplified in (7.10).

- (7.10) a. Kim is eating an ice cream cone, and Sandy is, too.  
 b. Sam washed his car, and Bill did, too.  
 c. Leslie may go to the concert, and Pat may, too.  
 d. Donna has been interviewed by Channel 7, and Pedro will be, too.  
 d'. \*Donna has been interviewed by Channel 7, and Pedro will, too.  
 e. Yolanda didn't see the UFO, and Vanessa didn't, either/\*too.  
 f. Yolanda didn't see the UFO, but Vanessa did (\*either/\*too).

All of these sentences have focal stress on the NP in the second conjunct, which is the only lexical element in the constituent projection of the second conjunct. The auxiliary configurations need not be identical in the two clauses, as (d) shows, but when they are different, all of the diverging auxiliary elements must be present in the second conjunct, as (d') shows. If the two conjuncts both contain negative

operators, as in (e), then *either* rather than *too* must be used. If the two clauses have different polarity, as in (f), then neither *either* nor *too* can be used. Not only may tense and other operators be different in the two clauses, but illocutionary force may also be different in each clause. This can be seen in (7.11).

(7.11) Mary is working on the assignment, but is Sam (\**either*/\**too*)?

When the illocutionary force is different across clauses, as when polarity is different, neither *too* nor *either* can occur. Accordingly, the nexus type is coordination. The syntactic structure of (7.10c) is given in Figure 7.2. *Too* is treated as a presuppositional adverb (Soames 1982), and consequently it must be a clausal modifier at the same level as the illocutionary force operator. The new feature of this representation is the constituent projection of the core of the second clause, since it contains only a single argument and the nucleus node dominates nothing and connects directly with its operator projection counterpart. Recall from chapters 1 and 6 that the constituent and operator projections are mirror images of each other, and accordingly there must be a full layered structure in each, due to the occurrence of a core argument in the constituent projection and at least two clausal operators (illocutionary force and tense) in the operator projection.

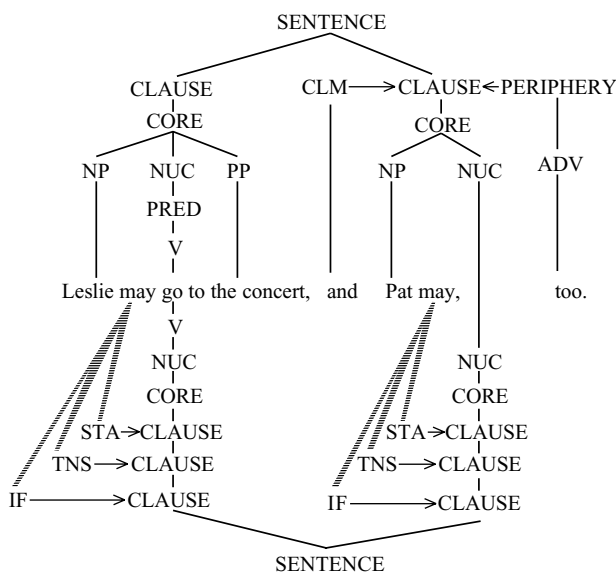


Figure 7.2 The syntactic representation of (7.10c)

The primary complexity in this construction lies in the linking between the syntactic and semantic representations. In the semantics-to-syntax linking, the elements in the semantic representation of the second clause which are identical to those in the semantic representation of the first clause are not mapped into the syntax. It might appear that this is technically a violation of the completeness constraint, since elements in the semantic representation of a clause



are not being mapped into the syntactic representation of that clause. It is not, however, as a close reading of the completeness constraint reveals. It is repeated in (7.12).

- (7.12) 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 referring expressions 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 crucial phrase is ‘must be realized syntactically *in the sentence*’; because the semantic information in the second clause is recoverable from the first clause, which is part of the same sentence, the constraint is satisfied.<sup>2</sup>

In the linking from syntax to semantics, the semantic representation of the second conjunct must be projected from the semantic representation of the first conjunct. The semantic representation of the first clause in (7.10a) is given in (7.13).

- (7.13)  $\langle_{\text{IF}} \text{DEC} \langle_{\text{TNS}} \text{PRES} \langle_{\text{ASP}} \text{PROG} ([\text{do}' (\text{Kim}, [\text{eat}' (\text{Kim}, \text{ice cream cone}))])$   
& INGR **eaten'** (ice cream cone))]]))

This semantic representation is projected as the semantic representation for the second clause, with a variable replacing the argument corresponding to the privileged syntactic argument of the first clause; this yields (7.14).

- (7.14)  $\langle_{\text{IF}} \text{DEC} \langle_{\text{TNS}} \text{PRES} \langle_{\text{ASP}} \text{PROG} ([\text{do}' (x, [\text{eat}' (x, \text{ice cream cone}))])$   
& INGR **eaten'** (ice cream cone))]]))

Since there is only one element in the constituent projection of the second clause, it will be linked to the *x* argument in (7.14), thereby giving the correct interpretation. When the operators in the two clauses are different, as in (7.10d) and (7.11), then only the logical structure(s) will be projected, as the operators are represented overtly in the clause.

One final complication arises in examples like (7.10b) with respect to the interpretation of the pronoun *his*. It has long been noted that such sentences are ambiguous, because the second clause can be interpreted as meaning that Bill washed Sam’s car, that Bill washed his own car or that they washed some third party’s car, just as the full, unreduced sentence can. This follows from the fact that the pronoun *his*, unlike a reflexive, is not constrained to take a

<sup>2</sup> There also seems to be discourse ‘VP’ ellipsis, as in (i).

- (i) Speaker 1: Kim is eating an ice cream cone.  
Speaker 2: Sandy is, too.

In this instance the completeness constraint would be violated, since Speaker 2’s utterance is a different sentence from Speaker 1’s. While a complete solution to this problem is beyond the scope of this discussion, the approach proposed in section 5.4.1 using discourse representation theory would be able to handle the interpretation of the second utterance.

particular antecedent, and therefore can refer to any of the possible antecedents. It must be specified, then, that, when the semantic representation is projected from the first clause, no non-obligatory coindexing is projected. By ‘non-obligatory coindexing’ is meant coindexing not associated with reflexives, which require obligatory coindexing. Hence the semantic representation of the second clause of (7.10b) would be as in (7.15).

- (7.15)  $\langle_{\text{IF}} \text{DEC} \langle_{\text{TNS PAST}} \langle \text{do}' (x, [\text{wash}' (x, [\text{have}' (3\text{sgM}, \underline{\text{car}}))]) \rangle \rangle \rangle \& \text{INGR}$   
**washed'** ( $[\text{have}' (3\text{sgM}, \underline{\text{car}})]) \rangle \rangle \rangle$

The 3sgM possessor can be construed as coreferential with *x*, with an NP in the previous clause, or with a discourse antecedent. In the following examples, the coindexing would be projected into the second clause and adjusted to reflect the fact that there is a different privileged syntactic argument in the second clause.

- (7.16) a. Dana saw herself, and Sally did, too.  
 b. Sam washed his own car, and Bill did, too.

Thus, if (7.17a) is the semantic representation for the first clause in (7.16a), then (7.17b) would be the projected semantic representation for the second clause.

- (7.17) a. **see'** ( $\text{Dana}_i, \text{herself}_i$ )  
 b. **see'** ( $x_j, x\text{-self}_j$ )

The constructional schema for English ‘VP’ ellipsis is given in Table 7.2 on the next page. These two constructions, ‘VP’ ellipsis and conjunction reduction, have been taken as evidence for the existence of a VP node in English clause structure, because the part of the clause left in the non-initial conjunct in conjunction approximates a VP and the part of the clause missing in the ellipsis construction also approximates a VP. It has, however, been possible to account for these constructions in terms of the interaction of the layered structure of the clause and focus structure, following the proposal sketched in section 3.5.

## 7.2 Linking in nuclear junctures

Many nuclear junctures have logical structures very much like lexical causative verbs and, not surprisingly, they have very similar linking properties. The argument structures of the component logical structures are pooled to yield the composite argument of the structure of the entire logical structure; hence their linking properties are the same as two- or three-argument lexical verbs. The linking in nuclear junctures with a linked intransitive verb is straightforward, whereas it becomes more complicated when the linked nucleus contains a transitive verb, as in (6.16b) from French, repeated below as (7.18a).

Table 7.2 *Constructional schema for English ‘VP’ ellipsis*

## CONSTRUCTION: English ‘VP’ ellipsis

## SYNTAX:

Juncture: clausal

Nexus: coordination

Construction type: conjunction

[CL [CORE . . . [NUC . . .] . . .] CLM [CL [CORE NP [NUC]]]

Unit template(s): clause 1 – (5.2)

clause 2 – PSA only, remainder structurally empty

Linking: voice must be the same in both conjuncts.

## MORPHOLOGY:

CLM: coordinating conjunction

AUX in Clause 2: default

ADV in clause 2, if same IF, polarity: *too* (positive polarity) / *either* (negative polarity)

## SEMANTICS:

Semantic representation of second clause is projected from the first clause:

(1) The PSA argument is replaced by a variable;

(2) All operators are projected, except those overtly present in Clause 2.

(3) Obligatory coindexing is preserved.

## PRAGMATICS:

Illocutionary force: shared across all conjuncts (default)

Focus structure: non-initial PSA must be focal, remainder of clause topical

- (7.18) a. Je            fer-ai            mang-er les            gâteaux à    Jean.  
           1sgNOM make-1sgFUT eat-INF the.Mpl cakes    DAT John  
           ‘I will make John eat the cakes.’
- b. Je            fer-ai            mang-er les            gâteaux par Jean.  
           1sgNOM make-1sgFUT eat-INF the.Mpl cakes    by John  
           ‘I will have John eat the cakes.’
- c. [do’ (1sg, Ø)] CAUSE [do’ (Jean, [eat’ (Jean, gâteaux)]) & INGR  
           eaten’ (gâteaux)]

When the linked nucleus contains an intransitive verb, its single argument will be the undergoer. When it contains a transitive verb, on the other hand, the question arises as to which argument will function as undergoer. Since this is a nuclear juncture, the logical structure in (c) maps into a single core. By the actor–undergoer hierarchy, *je* ‘1sgNOM’ would be actor, and, of the remaining two arguments, the patient *les gâteaux* is clearly the lowest ranking argument with respect to the undergoer end of the hierarchy and therefore will be undergoer. That leaves the effector *Jean* as a non-macrorole direct core argument, and assuming that French has the same basic case-marking rules as other accusative languages, i.e. the ones in (4.25) and (4.29), it will be assigned dative case, which in French is realized

by the preposition *à*. This accounts for (7.18a), and the linking from semantics to syntax is diagrammed in Figure 7.3. This basic linking accounts for what Comrie (1976) shows to be the predominant case-marking pattern found in this type of causative construction.<sup>3</sup>

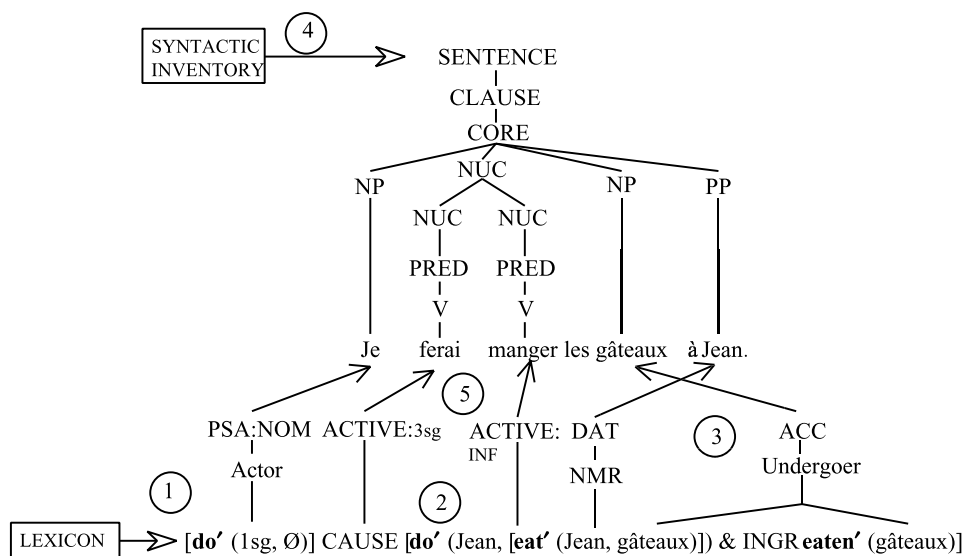


Figure 7.3 Semantics to syntax linking in the French nuclear juncture causative in (7.18a)

There is a second linking possibility for the logical structure in (7.18c), and it yields (7.18b), in which *Jean*, the causee, is marked by *par*, the preposition which marks passive agents in French passive constructions. The difference between the (a) and (b) sentences in (7.18) is more than just the choice of preposition; as in a passive construction, the PP *par Jean* can be omitted, yielding *Je ferai manger les gâteaux* 'I will have the cakes eaten', or 'I will have someone eat the cakes', whereas the dative PP *à Jean* cannot be omitted. Hence *par Jean* acts like an adjunct in the periphery<sub>CORE</sub>, whereas *à Jean* acts like a core argument. How can this be explained? Nuclear junctures have the logical structure of a transitive verb and therefore have actor and undergoer arguments. When the linked verb is intransitive, it contributes the argument that will function as undergoer. When it is transitive, it likewise contributes the argument that will function as undergoer, but it also contributes another argument which is a potential actor; indeed, if the embedded logical structure were to occur on its own, that argument would be the actor in the clause. What French allows, and what many other languages with this construction do not, is for the embedded transitive logical structure to

<sup>3</sup> See Van Valin and LaPolla (1997: section 9.2.2), for detailed discussion of case marking in nuclear juncture causative constructions cross-linguistically. It should be noted that secondary object languages work differently with respect to undergoer selection in these constructions; see the discussion of (4.60) from Yaqi in section 4.5 above.

take two macroroles, just as if it were an independent logical structure. Since the effector of *faire* 'make, cause' is also an actor, a problem arises: how can there be two actors in a single core? The answer is, there cannot be, and accordingly the actor which does not serve as the privileged syntactic argument appears in the periphery marked by *par*, just as in a passive construction, in which the actor is not a core argument. Which actor functions as the privileged syntactic argument? The actor of the matrix logical structure, that of *faire*, appears as the privileged syntactic argument. This follows from the fact that this actor is the first effector in a causal sequence, and it was argued in section 4.5 that the first effector in a causal sequence has priority for actor; in the rare circumstance when there are two actors, as in (7.18b), this principle may be extended to give the actor of the first effector in a causal sequence priority for selection as the privileged syntactic argument as well, since, in syntactically accusative languages, the norm is for the highest ranking argument in the logical structure to function as the privileged syntactic argument. This linking is presented in Figure 7.4. It should be clear that the linking from syntax to semantics in both (7.18a,b) can be handled by the linking algorithm in (7.2) without modification.

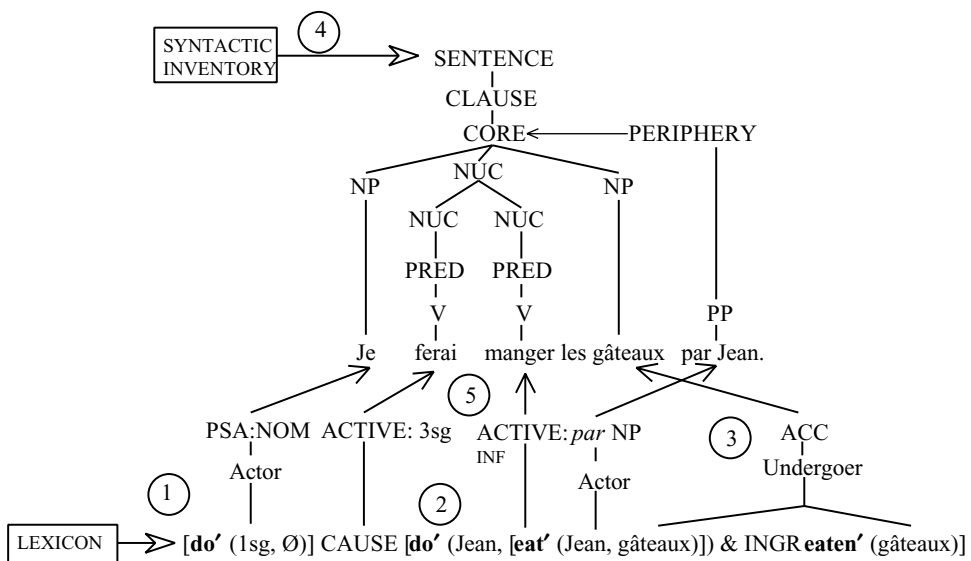


Figure 7.4 Semantics to syntax linking in the French nuclear juncture causative in (7.18b)

The constructional schema for the French nuclear juncture causative is given in Table 7.3 on the next page.

In addition to the syntactic difference regarding the causee in these two constructions, there is a semantic contrast as well, one which is captured somewhat in the English translations by means of the contrast between 'make' and 'have' as the gloss for *faire*. Hyman and Zimmer (1976) argue that in the construction in (7.18a) the causee may be interpreted as not acting volitionally, whereas in the

Table 7.3 *Constructional schema for French nuclear juncture causative construction in (7.18)*

CONSTRUCTION: French causative construction
SYNTAX:
Juncture: nuclear
Nexus: cosubordination
Construction type: serial verb
[CL [CORE NP [NUC [NUC . . .] [NUC . . .] NP . . .] . . .]
Unit template(s): (5.2)
PSA: none
Linking: default; or if verb in NUC <sub>2</sub> is transitive, then its logical structure may assign two MRs
MORPHOLOGY: none
SEMANTICS: [PRED <sub>NUC1</sub> ] CAUSE [PRED <sub>NUC2</sub> ]
PRAGMATICS:
Illocutionary force: unspecified
Focus structure: unspecified

construction in (b) the causee may be interpreted as acting volitionally. Another way of putting this is that the secondary effector, the causee, can more easily be construed as an agent in (b) than in (a), in terms of the implicature theory of agency proposed in section 2.4.1. Thus, *par* encourages the agent implicature, while *à* is basically neutral with respect to it. This difference in interpretation is evidence that the PP which is omitted in a sentence like *Je ferai manger les gâteaux* is *par* NP, not *à* NP. The translation is ‘I will *have* the cakes eaten’ or ‘I will *have* someone eat the cakes’, not ‘I will make the cakes be eaten’ or ‘I will make someone eat the cakes’, which is the interpretation of causatives with the causee marked by *à*.

Resultative constructions like *Vince has wiped the table clean* in (6.30a) are the best examples of nuclear junctures in English. Like the French constructions discussed above, they have a causative meaning, and they in fact have a logical structure like that of a lexical causative accomplishment: activity causes change of state with result. The logical structure for this example is given in (7.19b).

- (7.19) a. Vince has wiped the table clean.
- b. [do' (Vince, [wipe' (Vince, table)])] CAUSE [BECOME clean' (table)]

Unlike the lexical causative accomplishments discussed in chapter 2, both the causing activity and the change of state and result are explicitly specified. The linking here is straightforward: *Vince* is the actor and *the table* the undergoer, and because English is a strict SVO language, the undergoer occurs between the two nuclei (see Figure 6.10). The constructional schema for this construction is given in Table 7.4.

Table 7.4 *Constructional schema for English resultative construction in (7.19a)*

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CONSTRUCTION: English resultative construction
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---

SYNTAX:
Juncture: nuclear
Nexus: cosubordination
Construction type: serial verb
[CL [CORE NP [NUC [NUC <sub>1</sub> . . .] NP [NUC <sub>2</sub> . . .]]], NUC <sub>2</sub> ≠ V
Unit template(s): (5.2)
PSA: none
Linking: default
MORPHOLOGY: none
SEMANTICS: [PRED <sub>NUC<sub>1</sub></sub> ] CAUSE [PRED <sub>NUC<sub>2</sub></sub> ], PRED <sub>NUC<sub>2</sub></sub> [+static]
PRAGMATICS:
Illocutionary force: unspecified
Focus structure: unspecified

---

This schema can be applied to Goldberg's (1995) much-discussed example in (7.20).

- (7.20) a. Chris sneezed the napkin off the table.  
       b. [SEML **do'** (Chris, [**sneeze'** (Chris)])] CAUSE [BECOME NOT **be-on'** (table, napkin)]

This is a resultative construction with two somewhat unusual features, compared with resultatives like (7.19): first, the first logical structure is a semelfactive rather than an activity logical structure, and second, the first verb in the construction is intransitive rather than transitive. The second nucleus contains a predicative PP (cf. Figure 1.6), and this is common in motion resultatives like *Kim pushed the chair into the room*. Despite these differences, the basic semantics of the constructions fits the constructional schema, and the linking is straightforward: *Chris* is the actor, *the napkin* is the undergoer, and *off the table* is the result PP. Note that there is no reason to claim that *sneeze* has suddenly become transitive in this construction; because the arguments of the component logical structures are pooled to create a composite argument structure in a nuclear juncture, *the napkin* is an argument of the whole logical structure but not one of *sneeze*. Thus the basic constructional schema for English resultative constructions handles sentences like (7.20) without modification.

## 7.3 Linking in core junctures

Neither clausal nor nuclear junctures have required any revision of the linking algorithms in chapter 5, but some types of core junctures do. There are two

basic types of core junctures, subordinate and non-subordinate, each with rather different linking properties. Subordinate core junctures in English are illustrated in (7.21); they both involve daughter subordination.

- (7.21) a. Kim regretted Pam's dying her hair green.  
 a'.  $\langle_{\text{IFDEC}} \langle_{\text{TNS PAST}} \langle \text{regret}' (\text{Kim}, [[\text{do}' (\text{Pam}, [\text{dye}' (\text{Pam}, \text{her hair})])]) \text{CAUSE} [\text{BECOME green}' (\text{her hair})]]]) \rangle \rangle \rangle$   
 b. That Pam dyed her hair green shocked everyone.  
 b'.  $\langle_{\text{IFDEC}} \langle_{\text{TNS PAST}} \langle [[\langle_{\text{TNS PAST}} \langle [\text{do}' (\text{Pam}, [\text{dye}' (\text{Pam}, \text{her hair})])]) \text{CAUSE} [\text{BECOME green}' (\text{her hair})]] \rangle] \text{CAUSE} [\text{feel}' (\text{everyone}, [\text{shocked}'])]] \rangle \rangle \rangle$

The embedded logical structure in (7.21a') lacks clausal operators, and therefore it will be realized as a non-finite core, in this case a gerund. The one in (7.21b'), on the other hand, carries the clausal operator of tense, and therefore it will be instantiated as a tensed clause. The embedded logical structure links internally independently of the matrix logical structure, but as a whole unit it is part of the linking of the matrix logical structure, because the embedded logical structure is an argument of the matrix logical structure in the semantics and a core argument of the matrix predicate in the syntax. Thus, daughter subordination at the core level requires no revision of the linking algorithms from chapter 5.

Peripheral subordination at the core level also does not require any revision of the linking algorithms in (7.1) and (7.2).

- (7.22) a. Bill went for a run, after he finished his homework.  
 b. **be-after'** ([he finished his homework], [Bill went for a run])

In this example, *Bill went for a run* and *he finished his homework* are distinct clauses, and each is linked independently of the other, just as if each were a simple sentence on its own. The fact that there is a pronoun in the second clause referring (possibly) to *Bill* in the first clause does not affect the linking. A simplified logical structure for (b) is given in (7.22b). The first logical structure is the argument of *after*, while the second one is the logical structure of the matrix core, just as in a simple sentence like *Sandy presented the flowers to Chris at the party* in Figure 5.9. Step 5d1 in the semantics-to-syntax linking algorithm in (7.1) handles the assignment of *after* + clause to the periphery<sub>CORE</sub>. The revised version in (7.5) accomplishes this as well.

Non-subordinate core junctures do require revision of the linking algorithms. In chapter 6 it was argued that the criterial feature of non-subordinate core junctures is a shared semantic argument between or among the linked cores. This shared argument will require modification of the syntax-to-semantics linking algorithm. The discussion of non-subordinate core junctures begins with control constructions, and then moves on to matrix-coding (a.k.a. 'raising to subject', 'raising to object', 'exceptional case marking') constructions.



### 7.3.1 Control constructions

Examples of (obligatory) control constructions are given in (7.23).

- (7.23) a. Chris tried to see Pat.  
 b. Kim persuaded Pat to go to the party.  
 c. Robin promised Sandy to wash the dishes.

As discussed in section 4.2, there is a syntactic argument missing from the linked core which must be interpreted as being the same as one of the syntactic arguments of the matrix core. The matrix core argument interpreted as being the same as the missing syntactic argument in the linked core is the controller. Example (7.23a) shows ‘subject’ control, since the controller is the ‘subject’ of the matrix core. The (b) sentence illustrates ‘object’ control, since the controller is the ‘object’ of the matrix core. Finally, the (c) example involves ‘subject’ control. Since ‘subject’ and ‘object’ have no theoretical status in this framework, it is necessary to find an alternative analysis using the appropriate theoretical terms, i.e. syntactic pivot or controller, actor or undergoer. The theory of obligatory control refers to hypotheses about how the controller of the missing syntactic argument in the linked unit is to be determined. One of the most striking facts about control phenomena is how consistent control properties are across languages, regardless of their typological differences. The following examples illustrate control phenomena from Dyirbal, a syntactically ergative language, and Lakhota, a head-marking language; the Dyirbal examples are from Dixon (1972, 1994).

- (7.24) a. Bayi yaṛa-Ø walma-nu wayṇḍi-li. Dyirbal  
 NM.ABS man-ABS get.up-TNS go.uphill-PURP  
 ‘The man got up to go uphill.’  
 b. Balan yabu-Ø baṅgul ṇuma-ṇgu giga-n banagay-gu.  
 NM.ABS mother-ABS NM.ERG father-ERG tell-TNS return-PURP  
 ‘Father told mother to return.’
- (7.25) a. Wówapi ki Ø-yawá i-bl-úthe. Lakhota  
 book the INAN-read stem-1sgA-try  
 ‘I tried to read the book.’  
 b. Wówapi ki hená Ø-yawá-wičha-wa-ši.  
 book the those INAN-read-3plU-1sgA-tell  
 ‘I told them to read those books.’

Dyirbal does not express notions like ‘want’ or ‘try’ with complex sentence constructions, and accordingly a purpose construction is used to illustrate the first type of control construction. In Dyirbal and Lakhota, the control relations are analogous to those in the English examples in (7.23a,b), despite the major typological differences among the three languages.

From a purely syntactic perspective, languages like Dyirbal present an interesting problem: verbs meaning ‘tell’ are supposed to be ‘object’ control verbs, yet

in Dyirbal, the absolutive NP, the ‘subject’ (privileged syntactic argument), is the controller. Dyirbal is not the only syntactically ergative language that shows this control pattern. It is also found in Sama, another syntactically ergative language; the examples are from C. Walton (pers. comm.); see also Walton (1986).

- (7.26) a. Baya’ aku N-b’lli tinapay. Sama  
 want 1sgABS ANTI-buy bread  
 ‘I want to buy some bread.’
- b. Logos ku iya N-k’llo daing ma si ina’.  
 persuade 1sgERG 3sgABS ANTI-get fish OBL PM mother  
 ‘I persuaded him to get fish for mother.’
- c. Janji’ ku iya bayad-an saung.  
 promise 1sgERG 3sgABS pay-LOC tomorrow  
 ‘I promised him to pay [him] tomorrow.’

The single NP in the matrix core in (a) is *aku*, the first singular absolutive pronominal form, and as the only NP it must be the controller of the missing argument in the linked core. The actor in the matrix core in the last two sentences is expressed by *ku*, which is the first singular, ergative pronominal form, and the undergoer in the matrix core in both is expressed by *iya*, the third singular absolutive pronominal form. In (b) the matrix verb is *logos* ‘persuade’, and accordingly there is expected to be ‘object’ control; but because Sama is syntactically ergative, the controller *iya* is in fact the syntactic ‘subject’ (privileged syntactic argument). In (c) the matrix verb is *janji* ‘promise’, and accordingly, the expectation is for ‘subject’ control. But again, because this is a syntactically ergative language, the controller is not in fact the subject; it is the non-‘subject’ actor, *ku*.

In chapter 4 it was argued that Acehnese (Durie 1985, 1987) appears to lack grammatical relations (syntactic controllers and pivots) altogether. Yet the control facts in this language are just like those in all of the other languages looked at so far.

- (7.27) a. Geu-tém [(\*)geu-)taguen bu]. Acehnese  
 3-want (3A-)cook rice  
 ‘She wants to cook rice.’
- b. Geu-yue lôn [(\*)lôn-)peugöt kuwéh].  
 A-order 1sg (1sgA-)make cake  
 ‘(S)he ordered me to make a cake.’

In Acehnese, the control facts are exactly like those in English, Dyirbal, Lakshota and Sama. Thus, the basic control facts involving intransitive and transitive matrix verbs appear to be the same, regardless of whether the language is configurational like English or not, whether it has grammatical relations or not, or whether it is syntactically ergative or syntactically accusative.

Accounting for the controller in sentences in which there is only one possible controller, such as all of the (a) examples, is trivial. The interesting problem is posed by the control facts in the (b) and (c) examples. All of these sentences

involving verbs like *persuade* and *tell* have *undergoer* control. That is, the undergoer of the matrix core is the controller of the missing syntactic argument in the linked core; it is the undergoer of the matrix core which is the shared argument with the linked core, the core argument which functions as a semantic argument in the logical structure of each core. In Foley and Van Valin (1984) it was argued that this follows directly from the semantics of the verbs involved, and in particular from the semantics of causation, which may be represented roughly as in (7.28).

- (7.28) Actor acts on undergoer (by verbal or non-verbal means) → Undergoer  
does action

In the prototypical case, the actor acts on the undergoer by either verbal or non-verbal means with the intention that the undergoer do some action or be involved in some process or other change. Verbs denoting states of affairs in which the actor acts on the undergoer by non-verbal means are usually called ‘causative’ verbs, e.g. *make*, *force* or *cause* in English, whereas if the actor uses verbal means, the verbs denoting these states of affairs are called ‘jussive’ verbs, e.g. *tell*, *order* or *persuade* in English (cf. (6.37)). The resulting theory of obligatory control, proposed originally in Foley and Van Valin (1984), is stated in (7.29).

- (7.29) Theory of obligatory control  
1. Causative and jussive verbs have undergoer control.  
2. All other (M-)transitive verbs have actor control.

This theory applies to matrix verbs which are (M-)transitive; if the matrix verb is (M-)intransitive, then the single argument will be the controller by default.

This semantically based theory has numerous positive features. First, it applies without modification to all of the languages we have discussed, regardless of their typological characteristics. That is, because it is stated in terms of macroroles, it applies equally to Sama and to Lakhota, to Acehnese and Dyirbal and to English. Second, it predicts that sentences like (7.23c) should have actor control; that is, verbs like *promise* are not exceptional in this theory. In terms of (7.29), commissives are neither causative nor jussive and therefore should have actor control. Third, because the control facts are a function of the semantics of the matrix verb, they also carry over as preferences to other constructions involving these verbs, as illustrated in (7.30).

- (7.30) a. Tom promised Sam that he would wash the car.  
b. Tom persuaded Sam that he should wash the car.

The pronoun *he* in the *that*-clause is technically free to refer to either of the NPs in the matrix core or even to a discourse referent, but the preferred interpretations of both of these sentences follow the predictions of the theory of obligatory control: *Tom* is the preferred antecedent for *he* in (a), and *Sam* is the preferred antecedent for *he* in (b). Fourth, because the choice of the controller is tied to the semantics of

the verb, this analysis predicts that if a verb can be used alternatively as causative or non-causative or as jussive or non-jussive, then its control properties should change. This seems to be the case with a number of verbs of saying.

- (7.31) a. Larry asked Sally to leave.  
 b. Larry made a polite request to Sally that she leave.  
 c. Larry requested permission from Sally so that he could leave.

For many English speakers (7.31a) is ambiguous, and the two interpretations are given in (b) and (c). *Ask* can be construed either as a jussive verb, as in (b), or a verb for requesting something, as in (c); when it has a jussive interpretation, there is undergoer control, as in (b), and when it is non-jussive, there is actor control, as in (c), exactly as predicted. Fifth, because control choices are characterized in terms of macroroles, rather than grammatical relations, the behaviour of these verbs under passivization is predicted. Consider the examples in (7.32).

- (7.32) a. Pat was persuaded (by Kim) to go to the party. (cf. (7.23b))  
 b. \*Sandy was promised (by Robin) to help with the party. (cf. (7.23c))

Recall that the controller is the syntactic argument in the matrix core which also functions as a semantic argument in the linked core, and this entails that the controller must be a core argument in the matrix core. With a jussive verb like *tell* or *persuade*, the undergoer functions as privileged syntactic argument in a passive construction, and since it is a core argument, it continues to function as controller and the resulting sentence is fine, as (a) shows. As Cutrer (1987, 1993) points out, however, with a non-jussive verb like *promise*, the actor functions as an oblique peripheral constituent, not a core argument, in a passive construction, and consequently there is no core-argument controller in the matrix core; the resulting sentence is therefore ungrammatical, as (b) shows. The fact that 'subject'-controlled complements cannot be passivized is known in the literature as 'Visser's generalization', and it follows directly from the account of passive in chapter 4 and the theory of obligatory control in (7.29).

The theory of obligatory control in (7.29) and the completeness constraint in (7.12) play crucial roles in both phases of linking in these constructions. On the syntactic side, the linked core in a non-subordinate core juncture is missing a syntactic argument position, which is the syntactic pivot of the construction. In order to capture the fact that there is a syntactic argument slot missing in the linked core, it is necessary to add a universally valid qualification to the syntactic template selection principle in (5.2), namely, the occurrence of the core as the linked core in a non-subordinate core juncture reduces the number of core slots by 1. The revised principles are given in (7.33).

- (7.33) a. Syntactic template selection principle (revised formulation):  
 The number of syntactic slots for arguments and argument-ad adjuncts within the core is equal to the number of distinct specified argument positions in the semantic representation of the core.

- b. Universal qualification of the principle in (a):  
The occurrence of a core as the linked core in a non-subordinate core juncture reduces the number of core slots by 1.
- c. Language-specific qualifications of the principle in (a):
  1. All cores in the language have a minimum syntactic valence of 1.
  2. Argument-modulation voice constructions reduce the number of core slots by 1.
  3. The occurrence of a syntactic argument in the pre/postcore slot reduces the number of core slots by 1 (may override c1).

The statement in (b) does not specify which syntactic slot is missing, since that is a construction-specific feature. The linked core in the constructions in (7.23) will always be ‘subjectless’, and this is the central fact about these constructions that the linking system must accommodate.

The discussion of linking in control constructions will begin with the simplest example, (7.23a); its logical structure is given in (7.34b).

- (7.34) a. **do'** ( $x_i$ , [**try'** ( $x_i$ , [**see'** ( $y_i$ ,  $z$ ))])])  
 b. **do'** ( $\text{Chris}_i$ , [**try'** ( $\text{Chris}_i$ , [**see'** ( $y_i$ ,  $\text{Pat}$ ))])])

The verb *try* takes a non-subordinate core juncture because it is a psych-action verb, in terms of the interclausal relations hierarchy in Figure 6.22; this follows from the meaning of psych-action: the verb codes a mental disposition on the part of its actor to be involved in a state of affairs, and accordingly the actor must also be a semantic argument of the embedded logical structure, because the participant with the mental disposition must also be a participant in the state of affairs denoted by the embedded logical structure. Thus the actor of *try* must control the missing argument in the linked core, i.e. it must also function as a semantic argument in the embedded logical structure. Hence *Chris*, the only argument in the matrix core, is the controller. The crucial syntactic feature of non-subordinate core junctures is that the linked core lacks a syntactic argument position, following (7.33b). The missing argument is the syntactic pivot of the linked core, and in these constructions the pivot is the traditional ‘subject’; therefore it is the prenuclear core argument position that is missing in the linked core. Because there is an obligatorily shared semantic argument in the construction, one of the arguments in the embedded logical structure is not filled by lexical material but is coindexed with the controller in the matrix logical structure. The result is the logical structure in (7.34b), and how it links into the syntax is presented in Figure 7.5 on the next page. Given the logical structure in (7.34b), the linking algorithm in (7.1) can handle this case without modification. Even though the *y* argument in the embedded logical structure is not directly linked to an expression in the syntax, it is coindexed with *Chris*, which is linked to the syntax, thereby satisfying the completeness constraint.

There are other coindexing possibilities in the logical structure in (7.34); they are given in (7.35).

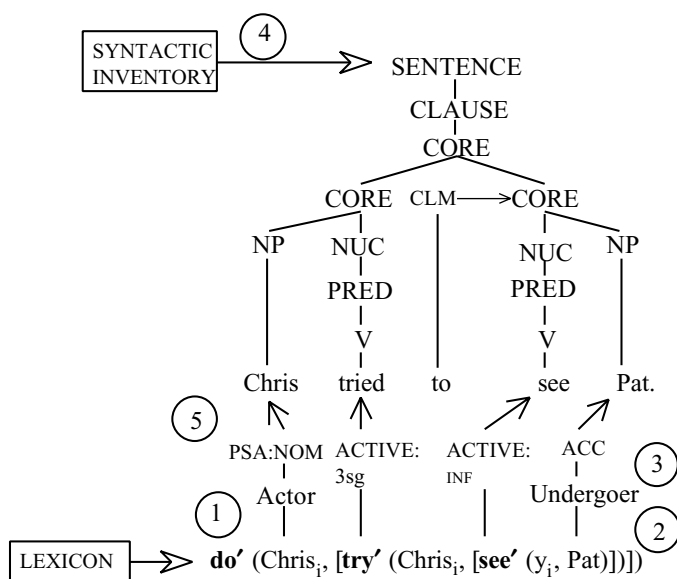


Figure 7.5 Linking from semantics to syntax in English control construction in (7.23a)

- (7.35) a. \*Chris<sub>i</sub> tried [Pat] to see—<sub>i</sub>.  
 a'. **do'** (Chris<sub>i</sub>, [**try'** (Chris<sub>i</sub>, [**see'** (Pat, z<sub>i</sub>))]))  
 b. Chris tried to be seen by Pat.  
 b'. **do'** (Chris<sub>i</sub>, [**try'** (Chris<sub>i</sub>, [**see'** (Pat, z<sub>i</sub>))]))  
 c. \*Chris<sub>i</sub> tried [Pat] to be seen [by —<sub>i</sub>].  
 c'. **do'** (Chris<sub>i</sub>, [**try'** (Chris<sub>i</sub>, [**see'** (y<sub>i</sub>, Pat)]]))

For each of the possible coindexings, there is only one grammatical output. What rules out the impossible linkings? The answer is, the completeness constraint. In (a), the actor of *try* is coindexed with the second argument of *see*. This means that *Chris* is the actor of *try* and *Pat* is the actor of *see*, and when these assignments are mapped into the syntactic structure in Figure 7.5 a problem immediately arises: there is no syntactic position in the second core for an actor to appear in, since the second core has an active voice verb. Hence *Pat* cannot be realized in the syntactic representation, and this violates the completeness constraint. This is given in Figure 7.6. It is impossible to link an actor to the post-nuclear core argument slot, since actors may only be linked to the generalized privileged syntactic argument ('subject') position in an active-voice core in English. Hence no special constraints or principles are needed to explain the impossibility of this potential linking.

The other two sentences involve passive voice in the second core, and here too only one of the two possible linkings is permitted. The sentence in (7.35b) has the same logical structure as in (7.35a), but the second core is passive. This

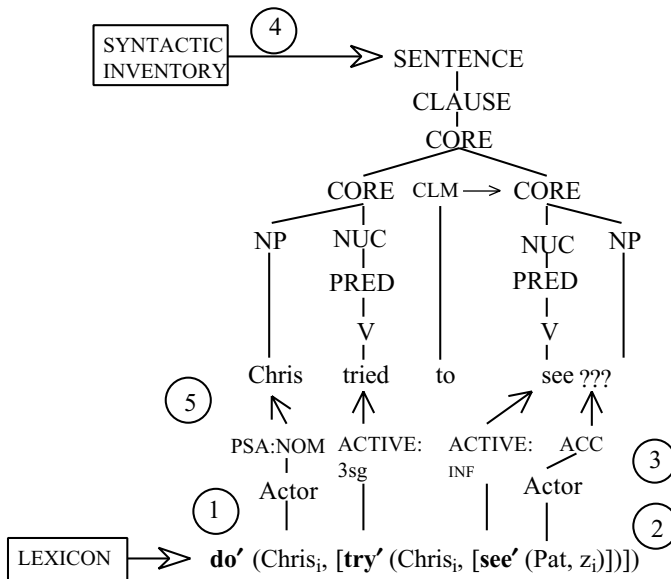


Figure 7.6 Failed linking from semantics to syntax in (7.35a)

makes possible a linking which does not violate the completeness constraint, as Figure 7.7 shows. The final possible combination is the syntactic representation of Figure 7.7 with the logical structure in (7.34); this combination cannot be successfully linked, as Figure 7.8 shows. The first thing to note here is that the sentence *Chris tried to be seen* is perfectly grammatical, but it is not a

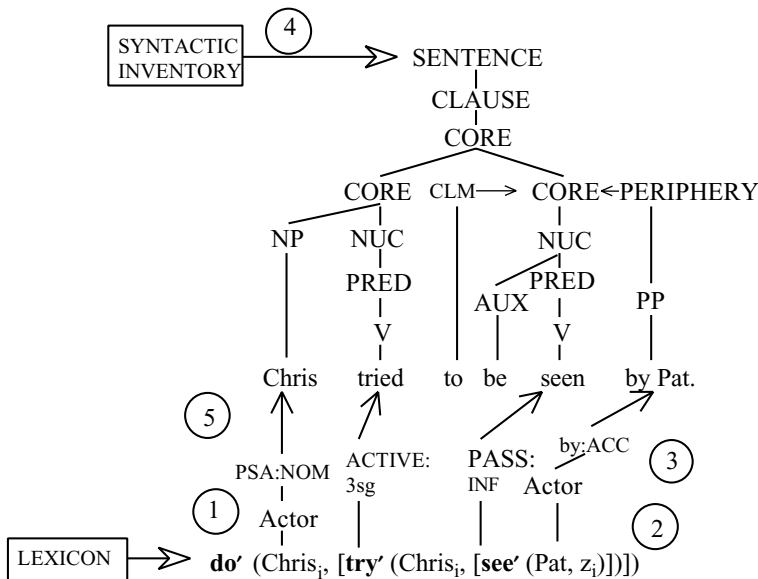


Figure 7.7 Linking from semantics to syntax in (7.35b)

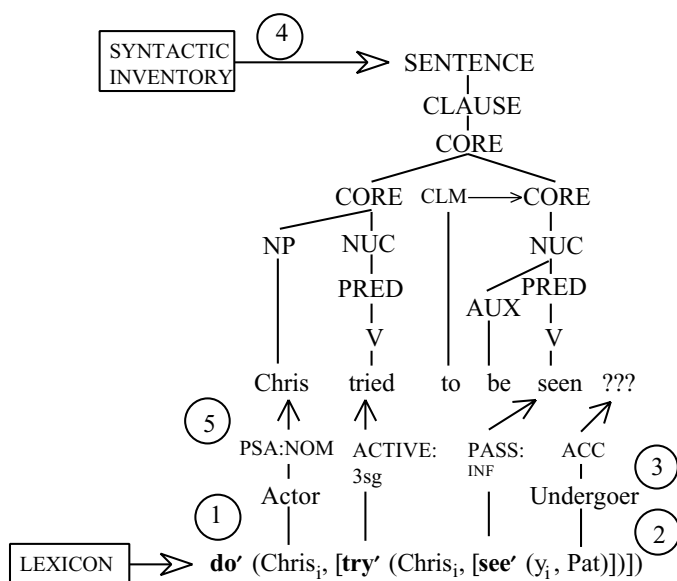


Figure 7.8 Failed linking from semantics to syntax in (7.35c)

possible realization of the logical structure in (7.35c'). Its logical structure is **do'** (Chris<sub>i</sub>, [**try'** (Chris<sub>i</sub>, [**see'** (Ø, z<sub>i</sub>)])]), where the actor of the embedded logical structure is unspecified. The linking in Figure 7.8 violates the completeness constraint, because the undergoer *Pat* cannot be realized overtly in this syntactic structure. An undergoer in English can only be realized as a core argument, either in its default post-nuclear position or as privileged syntactic argument in a passive, and neither of these options is available in this structure. The only possible realization for this logical structure is as in Figure 7.5, as noted above.

The four possibilities in (7.34) and (7.35) have been accounted for in terms of the linking algorithm in (7.1) and the completeness constraint; no special principles or constraints are required. In particular, it is not necessary to stipulate in the lexical entry for *try* that it must share an argument with its complement logical structure. Thus, there is no need to rule out via stipulation that **do'** (Chris, [**try'** (Chris, [**see'** (Dana, Pat)])]) is an impossible logical structure, since there is no possible linking between it and any of the syntactic structures in Figures 7.5–7.8 that could satisfy the completeness constraint. Moreover, the same is true with respect to the more complex examples in (7.23b,c); they are handled in exactly the same way. The only complexity they raise is that the theory of control in (7.29) specifies which argument in the matrix logical structure is coindexed with the lexically unfilled argument in the embedded logical structure. No stipulations would be required regarding which argument in the embedded logical structure would be lexically unfilled and coindexed with the argument in the matrix logical



structure, because the correct coindexings fall out exactly as in (7.34) and (7.35) (as in Figures 7.5–7.8).

The problem of linking from syntax to semantics in these constructions requires the theory of obligatory control, because the correct interpretation of the sentence depends upon the correct assignment of the controller in the matrix core. Since the issue of the controller is trivial in clauses with M-intransitive matrix verbs, attention will be focussed on clauses with M-transitive matrix verbs like *promise* and *persuade* in English and other languages. The syntax to semantic linking in the Dyrbal example in (7.24b), following the algorithm in (7.2), is presented in Figure 7.9; the numbers refer to the steps in (7.2). The bulk of the linking is just as for the simple sentences discussed in chapter 5. Having determined the voice of the verb, the NPs functioning as actor and undergoer can be identified (step 1c2), and after accessing the lexical entries for the verbs in the lexicon and constructing the composite logical structure for the whole sentence, the actor and undergoer assignments for the arguments in it can be determined (step 2). The third step is to match the actor and undergoer of *gigal* ‘tell’ in the syntax with the actor and undergoer of its logical structure. At this point, all of the relevant steps in (7.2) have been executed, and yet there is, crucially, an unlinked argument, the actor of *banagay* ‘return’; the completeness constraint remains unsatisfied. This is where the theory of obligatory control in (7.29) comes into play: because *gigan* ‘tell’ is a jussive verb, its undergoer is the controller, and accordingly, the undergoer of *gigan* is linked to the actor of *banagay*, yielding the correct interpretation of the sentence and satisfying the completeness constraint. The obligatory control linking is represented by the thick, solid black line.

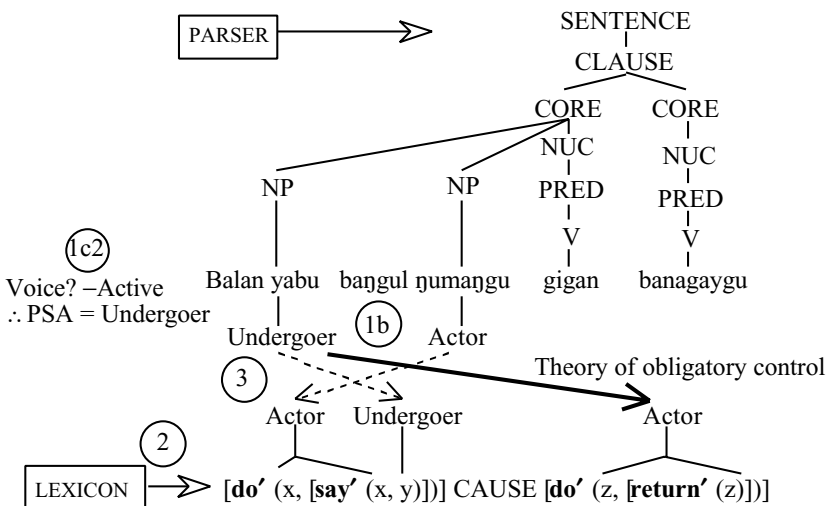


Figure 7.9 Linking from syntax to semantics in Dyrbal control construction in (7.24b)

It is clear that it is necessary to add a step to the syntax to semantics linking algorithm to accommodate the crucial role that the theory of obligatory control plays. Accordingly, the following step may be added to (7.2); it follows step 3, and consequently step 4 in (7.2) is now step 5 and step 5 in (7.2) is now step 6. The final version of the linking algorithm will be given in (7.74).

- (7.36)
4. In non-subordinate core junctures, one of the arguments of the matrix core must be linked to an argument position in the embedded logical structure, following (7.29).

The constructional schema for the English obligatory control construction is given in Table 7.5. The schema covers all of the constructions with *persuade*- and *promise*-type verbs discussed in this section. The controller is in core 1 and is determined by (7.29). The pivot of the construction is in core 2, not core 1, and it is the highest ranking core macrorole. The linking is specified as ‘default’, as it follows (7.36) without modification.

Table 7.5 *Constructional schema for English control constructions in (7.23)*

CONSTRUCTION: English obligatory control construction
SYNTAX:
Juncture: core
Nexus: co(sub)ordination
Construction type: serial verb
[CL [CORE NP [NUC . . .] (NP)] CLM [CORE [NUC . . .] . . .]
Unit template(s): Core 1: (7.33a,c)
Core 2: (7.33a,b,c)
PSA: Core 1: controller = semantic controller, following (7.29)
Core 2: pivot = variable syntactic pivot (4.15a,c2)
Linking: Default
MORPHOLOGY: CLM <i>to</i> , <i>from</i> or Ø
SEMANTICS: psych-action, causative/jussive; commissive, directive speech acts
PRAGMATICS:
Illocutionary force: unspecified
Focus structure: unspecified

7.3.2

Matrix-coding constructions

Matrix-coding constructions have gone by a number of names in the history of linguistics; the term ‘matrix coding’ is taken from Frajzynger (1995), who proposed it as a theory-neutral label. There are two basic types of matrix-coding constructions: what is called ‘raising to subject’ in the generative literature, as in (7.37a), and the construction in (b) which was originally called ‘raising to

object' in transformational grammar but is known in the principles and parameters literature as the 'exceptional case marking' construction.

- (7.37) a. Mary seems to know the answer.  
 a'. It seems that Mary knows the answer.  
 b. Pat believes Chris to have eaten the bagel.  
 b'. Pat believes that Chris ate the bagel.

Each of these constructions has an alternative form in which there is a finite *that*-clause complement, and in both the core argument which is the 'subject' of the finite embedded clause in the alternative construction appears as a core argument in the matrix core, as 'subject' in (7.37a) or 'object' in (b), hence the names from transformational grammar. The two sentences in each pair have the same logical structure but different semantic representations. This is illustrated for (7.37b,b') in (7.38), in which the logical structure for both sentences is given in (a) and abbreviated semantic representations for them are given in (b) and (c).

- (7.38) a. **believe'** (Pat, [**do'** (Chris, [**eat'** (Chris, bagel))] & INGR **eaten'** (bagel))]  
 b.  $\langle \text{IFDEC} \langle \text{TNS PRES } \langle \text{believe' (Pat, [}_{\text{ASP PERF}} \langle \text{do' (Chris, [eat' (Chris, bagel)]}) \& \text{ INGR eaten' (bagel)]}) \rangle \rangle \rangle \rangle \rangle \rangle$  = (7.37b)  
 c.  $\langle \text{IFDEC} \langle \text{TNS PRES } \langle \text{believe' (Pat, [}_{\text{TNS PAST}} \langle \text{do' (Chris, [eat' (Chris, bagel)]}) \& \text{ INGR eaten' (bagel)]}) \rangle \rangle \rangle \rangle \rangle \rangle$  = (7.37b')

The lack of the obligatory tense operator modifying the embedded logical structure in (b) entails that it will not be realized as a tensed clause, i.e. as a *that*-clause. Hence the semantic representation in (b) is for a core juncture. In (c), on the other hand, there is a tense operator modifying the embedded logical structure, and therefore it will be realized as a tensed clause. There are subtle differences in meaning between the two forms, which have been investigated in, e.g., Borkin (1984) and Langacker (1995).

The 'raising to subject' or 'matrix-coding as privileged syntactic argument' construction is illustrated in (7.39) from Icelandic (Thr  nsson 1979) and Kinyarwanda (Bantu; Kimenyi 1980); cf. also the examples from Acehnese in (4.5).

- (7.39) a. Harald-ur vir  ist haf-a far-i   heim. Icelandic  
 Harold-MsgNOM seem.3sgPRES have-INF go-PSTP home  
 'Harold seems to have gone home.'  
 b. Ab  -ny  shuur ba-kwii-ye gu-some ibitabo. Kinyarwanda  
 2-student 2-essential-ASP INF-read 8-book  
 'Students must read the books.'  
 b'. Bi-r  -kwii-ye ko ab  -ny  shu  ri ba-s  m-a ibitabo.  
 8-PRES-essential-ASP CLM 2-student 2-read-ASP 8-book  
 'It is essential that students read the books.'

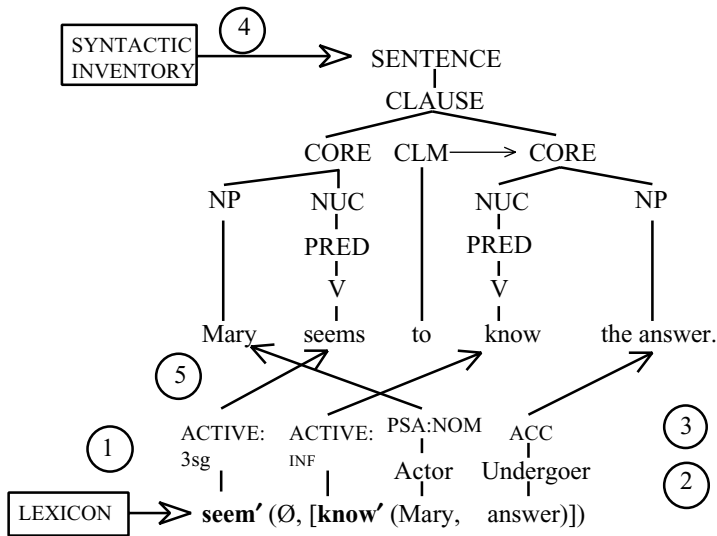
There is no Icelandic counterpart to (7.37a') involving the verb *virðast* 'seem' plus a tensed complement. The counterpart to the Kinyarwanda matrix-coding construction is given in (b'). The primary predicates which allow this construction in English are *seem*, *appear*, *be likely* and *be certain*, while only *virðast* 'seem' allows it in Icelandic, according to Thráinsson (1979). Kimenyi (1980) describes the verbs that occur in this construction in Kinyarwanda as 'modality impersonal verbs' (e.g. *-shobok-* 'be possible', *-kwû-* 'be essential' and *-bujijw-* 'be forbidden'), and factitive verbs like *-babaj-* 'be sad' and *-taangaj-* 'be fascinating'.

The essential feature of the verbs in this construction is that they are either atransitive, like English *seem* and Icelandic *virðast*, or they are intransitive like English *be likely* and *be certain*. The logical structure for English *seem* and Icelandic *virðast* is **seem'** (x, y) [MR0], where the x argument is a perceiver which is optionally realized in English by a *to* PP and in Icelandic by a dative NP, as illustrated by the Icelandic example in (7.40) and its English translation.

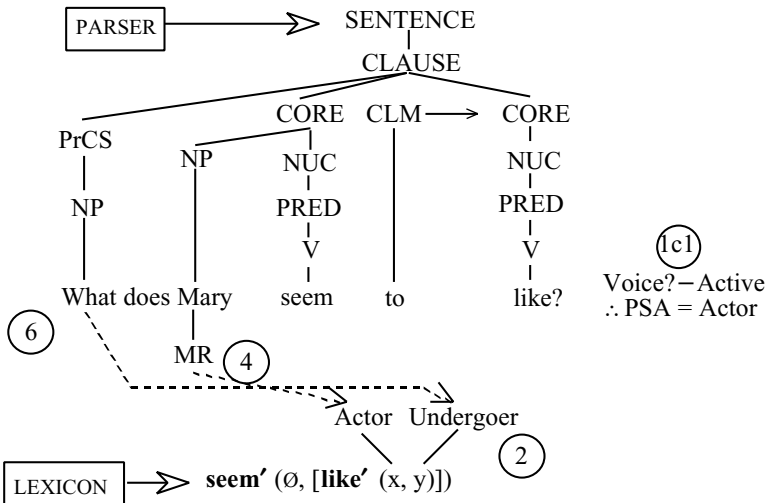
- (7.40) Harald-ur virðist mér ver-a besti dreng-ur.  
 Harold-MsgNOM seem.3sgPRES 1sgDAT be-INF best boy-MsgNOM  
 'Harold seems to me to be a nice guy.'

The y argument is a proposition; hence it is filled by another logical structure. The occurrence of an argument from the embedded logical structure in the core headed by *seem* comes about as follows. There is a direct core argument slot in the matrix core, but the verb has no arguments which can fill it; moreover, since this is a core juncture, the second core is missing the prenuclear core argument position, following (7.33b). The semantic argument that would normally function as the privileged syntactic argument in the second core cannot be realized in it, due to the absence of its syntactic slot, and this would normally lead to a completeness constraint violation, as in, e.g., Figure 7.6. However, there is an open core argument position within the clause, namely the one in the matrix core. The argument may be linked to this position, thereby avoiding a completeness constraint violation. This linking across a core boundary is permitted by step 5a in (7.1), because it specifies the assignment of [–WH] arguments 'to the appropriate positions in the clause'. This step in the linking is clause-bound but not core-bound; hence this linking is allowed.

The linking from semantics to syntax in (7.37a) is given in Figure 7.10 on the next page. *Mary* is the actor of *know* but a core argument in the core headed by *seem*. The syntactic structure in Figure 7.10 is similar to that in the control constructions with *try* in Figure 7.5, but differs in terms of nexus. *Try*-constructions are cosubordinate, due to the shared deontic modality operator across the two cores. Sharing a core operator across the two cores is ruled out in principle in this construction, however, because the matrix predicate does not have an argument that can be modified by a deontic modal operator. Hence the nexus is coordinate. The essential difference between the two constructions lies not in the syntactic structure but rather in how the linking works, which is primarily a function of the semantic properties of the predicate in the matrix core.



The linking from syntax to semantics in this construction requires only a minor modification of the linking algorithm in (7.2) and (7.36). The linking for *What does Mary seem to like?* is given in Figure 7.11. As before, the numbers refer to the steps in the linking algorithm in (7.2) as modified in (7.36). Step 1 applies in each core; since the first core is intransitive, the only conclusion that can be drawn is that *Mary* is a macrorole argument; there is no evidence in the first core



as to whether it is actor or undergoer. In the infinitival core the voice is active, and therefore the privileged syntactic argument NP would be the actor, if there were one in the core. Step 2 is straightforward. In order to execute step 3, the information from step 1 must be used. The core argument *Mary* cannot be linked to an argument position in the logical structure of *seem*, because the first argument is unspecified and the second one is filled by a propositional logical structure. There are no core arguments in the second core to be linked to the embedded logical structure *like'* (x, y), and therefore *Mary* can be linked to an argument position in the embedded logical structure; the question is, which one? As in the control constructions discussed above, the obligatorily missing argument in the linked core is the syntactic pivot, and since step 1 revealed that the privileged syntactic argument of the second core is the actor, *Mary* must be linked to the actor argument in the semantic representation. Finally, the WH-word in the precore slot is linked to the remaining unlinked argument position, following step 6. The result is the correct linking, with *Mary* interpreted as the actor of *like* and *what* as the undergoer.

The only modification of (7.36) that is required is to specify that, in step 4, the theory of obligatory control in (7.29) applies only to control verbs. This may be stated as in (7.41).

- (7.41) 4. In non-subordinate core junctures, one of the arguments of the matrix core must be linked to an argument position in the embedded logical structure:
- a. If the matrix predicate is a control verb, this follows (7.29); otherwise,
  - b. If the matrix predicate is not a control verb, then link the unlinked syntactic argument in the matrix core to the logical structure argument position of the privileged syntactic argument of the linked core.

An example of a matrix-coding as non-privileged syntactic argument ('raising to object') construction from Icelandic (Thráinnsson 1979) is given in (7.42).

- (7.42) a. Jón-Ø                      tel-ur                      í barnaskap sínum  
 John-MsgNOM believe-3sgPRES in foolishness his  
 að Harald-ur                      haf-i                      tek-ið                      bók-in-a.  
 CLM Harold-MsgNOM have.SBJ-3sgPRES take-PSTP book-DEF-FsgACC  
 'John believes in his foolishness that Harold has taken the book.'
- b. Jón-Ø                      tel-ur                      Harald-Ø                      í barnaskap sínum  
 John-MsgNOM believe-3sgPRES Harold-MsgACC in foolishness his  
 haf-a                      tek-ið                      bók-in-a.  
 have-INF take-PSTP book-DEF-FsgACC  
 'John believes in his foolishness Harold to have taken the book.'

The (a) sentence involves a finite complement and no matrix coding, whereas the (b) form shows the construction in question. In the Icelandic examples the adverbial phrase *í barnaskap sínum* 'in his foolishness' modifies *Jón telur* 'John believes' and hence is a constituent of the matrix core. The fact that the accusative NP *Harald* 'Harold' occurs between it and *telur* 'believes' shows that *Harald* is in

fact a constituent of the matrix core in (b). It is clear, then, that in the (b) example the accusative NP in the matrix core is a semantic argument of the verb in the linked core.

As in the construction discussed in the previous section, there must be a core argument position in the matrix core which cannot be filled by a semantic argument from the logical structure of the matrix predicate. Since these verbs are obviously not (M)-atransitive like *seem*, the explanation for this open syntactic slot must lie elsewhere. In Foley and Van Valin (1984) it was noted that there is a systematic relationship between the S-transitivity of a verb when it takes NP or clausal syntactic arguments and that when it functions as a complement-taking predicate in a core juncture; namely, its s-transitivity is reduced by one in core junctures. This is illustrated in (7.43).

- (7.43) a. Three core arguments → two  
*Phil told Dana a story* [3] → *Phil told Dana to . . .* [2]  
*Kim promised Sandy a picture of Chris* [3] → *Kim promised Sandy to . . .* [2]
- b. Two core arguments → one  
*Eileen remembered her purse* [2] → *Eileen remembered to . . .* [1]  
*Beckie wants a new Porsche* [2] → *Beckie wants to . . .* [1]

It appears, then, that not only is the S-transitivity of the linked core reduced by 1 but that of the matrix core is as well. This is the case only when the linked core is a semantic argument of the matrix verb in logical structure. In purpose constructions, e.g. *Bill brought the book for Sam to read*, the purpose clause [core] is not a semantic argument of the matrix verb, and consequently there is no reduction of the S-transitivity of the matrix core. It is necessary, therefore, to amend (7.33b) to reflect this. The revised template selection principles are given in (7.44).

- (7.44) a. Syntactic template selection principle (revised formulation):  
 The number of syntactic slots for arguments and argument-adjuncts within the core is equal to the number of distinct specified argument positions in the semantic representation of the core.
- b. Universal qualification of the principle in (a):  
 The number of slots in a core is reduced by 1 if:
1. it is the matrix core in a non-subordinate core juncture in which the linked core is a semantic argument of the matrix verb, and
  2. it is the linked core in a non-subordinate core juncture.
- c. Language-specific qualifications of the principle in (a):
1. All cores in the language have a minimum syntactic valence of 1.
  2. Argument-modulation voice constructions reduce the number of core slots by 1.
  3. The occurrence of a syntactic argument in the pre/postcore slot reduces the number of core slots by 1 (may override c1).

What happens with *believe*? If it followed the pattern in (7.43) and (7.44b1), then we should have *Juan believed the story* [2] → *\*Juan believed to . . .* [1] as the only two patterns with this verb. But this is not the case. Rather, with *believe*

we have *Juan believed the story* [2] → *Juan believed Carlos to . . .* [2]. This is also true for the other verbs which license the construction in (7.37b), e.g. *expect*, *consider* and *find*. Hence the crucial property of the verbs in this construction is that they are exceptions to the general pattern in (7.43) and therefore to (7.44b1) and have one more syntactic argument position in their core than they should.

The actual linking in this construction is the same as that in the other matrix-coding construction, and it is illustrated for the Icelandic example in (7.42b) in Figure 7.12; the adverbial phrase *í barnaskap sínum* ‘in his foolishness’ is omitted. If the linking in the second core had been passive, then the undergoer *bók-* ‘book’ would have appeared in the open matrix core slot, yielding the Icelandic equivalent of ‘John believes the book to have been taken by Harold’, *Jón telur bókina hafa verið tekið af Haraldi*.

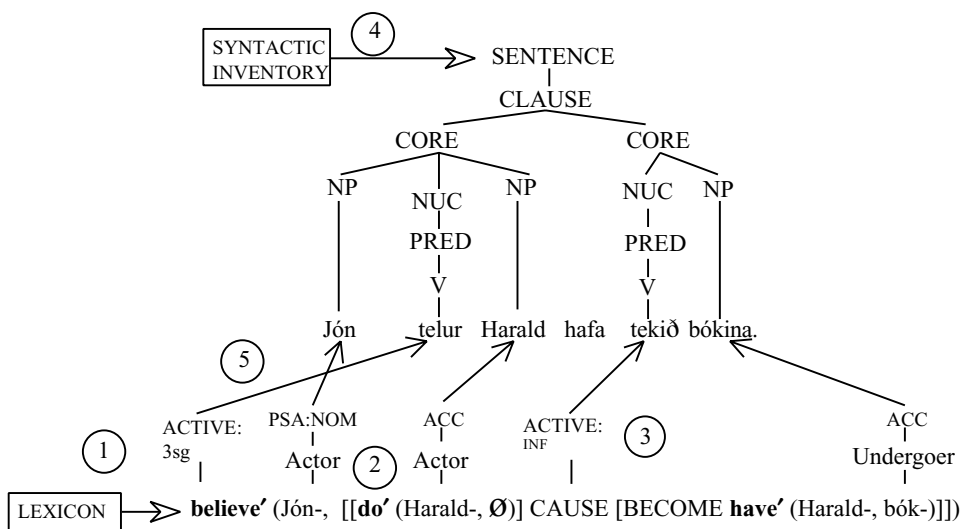


Figure 7.12 Linking from semantics to syntax in the Icelandic construction in (7.42b)

The syntax to semantics linking algorithm in (7.41) applies to matrix-coding constructions with *believe/telja*, *expect*, etc., in exactly the same way as to the ones with *seem/virðast* discussed in the previous section. This should come as no surprise, since the two constructions are basically the same in terms of linking. The linking from syntax to semantics for *Chris was believed by Pat to have eaten the bagel* is given in Figure 7.13 on the next page. As before, the numbers refer to the steps in (7.41). Each core contains an M-transitive verb, and therefore step 1 applies to both. Because the verb in the first core is passive, and *Chris* must be a macrorole argument and is not the actor of *believe*, the actor of *believe*, *Pat*, is in the periphery<sub>CORE</sub> marked by the preposition *by*. In the second core, the verb is active, and therefore its privileged syntactic argument is an actor and *the bagel* is an undergoer. Step 2 is straightforward, and in step 3 it is possible to link *Pat* with the actor of *believe* and *the bagel* with the undergoer of *eat*.



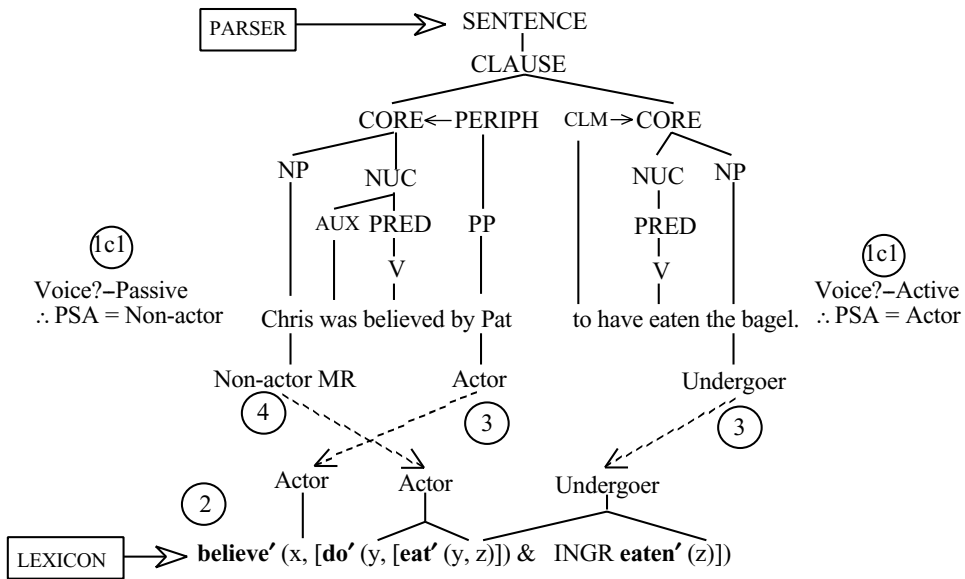


Figure 7.13 Linking from syntax to semantics in English matrix-coding construction

There was no argument position available for *Chris* in the logical structure of *believe*, and therefore step 4 comes into play. The actor of *eat* is the only unlinked argument position in the logical structure, and it is the argument that would be the privileged syntactic argument of *eat*, were it to occur as the main verb in a simple clause. By step 4 *Chris* may be linked to the actor of *eat*, which yields the correct interpretation of the sentence and satisfies the completeness constraint. Note that the label ‘non-actor MR’ under *Chris* in Figure 7.13 means that *Chris* is not the actor of *believe*; it does not mean that the NP cannot be interpreted as the actor of a different verb.

The constructional schemas for the English matrix-coding constructions are given in Table 7.6 on the next page. There are two schemas here, as the crucial feature of the second construction is the violation of (7.44b1); the first construction follows it. As in control constructions, the syntactic pivot is in core 2, not core 1, and it is, following the hierarchy for English, the highest ranking core macrorole. The linking is specified as ‘default’, since it follows (7.41) without modification. These schemas would also work for the Icelandic constructions, with the exception that there is no clause linkage marker in the Icelandic matrix-coding constructions.

### 7.3.3 Core junctures and the domain of case assignment

The two types of non-subordinate core junctures we have discussed, control and matrix-coding constructions, interact with the case-marking rules proposed in chapter 4 in different ways.

Table 7.6 *Constructional schemas for English matrix-coding constructions*

CONSTRUCTION: English matrix-coding as PSA construction
SYNTAX:
Juncture: core
Nexus: coordination
Construction type: serial verb
[CL [CORE NP [NUC . . .] (PP)] CLM [CORE [NUC . . .] . . .] . . .]
Unit template(s): Core 1: (7.44)
Core 2: (7.44)
PSA: syntactic pivot of Core 2 – variable syntactic pivot (4.15a,c2)
Linking: default
MORPHOLOGY: CLM <i>to</i>
SEMANTICS: propositional attitude, perception, evidential
PRAGMATICS:
Illocutionary force: unspecified
Focus structure: unspecified
CONSTRUCTION: English matrix-coding as non-PSA construction
SYNTAX:
Juncture: core
Nexus: coordination
Construction type: serial verb
[CL [CORE NP [NUC . . .] NP] CLM [CORE [NUC . . .] . . .] . . .]
Unit template(s): Core 1: violates (7.44b1)
Core 2: (7.44)
PSA: syntactic pivot of Core 2 – variable syntactic pivot (4.15a,c2)
Linking: default
MORPHOLOGY: CLM <i>to</i>
SEMANTICS: propositional attitude, perception, cognition
PRAGMATICS:
Illocutionary force: unspecified
Focus structure: unspecified

There is no real problem with case marking in the matrix core of control constructions. The basic rules for case assignment in accusative constructions from chapter 4 are repeated in (7.45).

- (7.45) Case assignment rules for accusative constructions:
- assign nominative case to the highest ranking macrorole argument.
  - assign accusative case to the other macrorole argument.

In a sentence like *They persuaded us to go to the party*, the third-plural actor is the highest ranking macrorole and therefore nominative, and the first-plural undergoer is the other macrorole and therefore accusative. The interesting examples are those

involving matrix coding, such as the Icelandic example in (7.42b) and its English equivalent, *John believes Harold to have taken the book*. In Icelandic, *Jón* ‘John’ is nominative and *Harald* ‘Harold’ is accusative, and the same pattern holds in English if we replace the proper nouns with pronouns, i.e. *he believes him to have taken the book*. *Jón* and *he* are the actor arguments of *telja* and *believe*, but *Harald* and *him* are the actor arguments of *taka* and *take*. Thus the matrix core contains two actor arguments; how is their case to be decided? The logical structure of these sentences is given in (7.46).

(7.46)      **believe’** (x, [[**do’** (y, Ø)] CAUSE [BECOME **have’** (y, z)])

*Jón* or *he* is the *x* argument, and *Harald* or *him* is the *y* argument. There is a very simple solution to the problem at hand: only *Jón* and *he* are arguments of *telja* or *believe*, while *Harald* and *him* are not, and therefore *Jón* and *he* are the highest ranking arguments of *telja* and *believe* and receive nominative case, following (7.45a). *Harald* and *him* are the other macrorole arguments and therefore receive accusative case. Note that there would have been a serious problem if (7.45b) had been ‘assign accusative case to the undergoer’, since the accusative NPs in these examples are not undergoers. In sentences like (7.37a) and (7.39a), the only macrorole in the matrix core is a semantic argument of the predicate in the linked core; since it is the only macrorole in the core, it counts as the highest ranking and gets nominative case. Thus, the case assignment rules proposed in chapter 4 for simple sentences can account for case marking in the matrix cores in these examples.

In section 4.4, it was stated that the case-marking rules in (4.25) apply to direct syntactic arguments within the core or in the pre/postcore slot, and since only simple sentences were discussed there, this was the only possible domain they could apply in. However, in core junctures there is more than one core in a clause, and so the question arises, do the case-marking rules apply to each individual core separately, or do they apply to all of the cores jointly within the clause? It turns out that languages vary with respect to the domain of case assignment: in some it is the clause, while in others it is the core.

Icelandic presents the clearest example of a language in which the domain of case marking is the core. The case-assignment rules for Icelandic are given in (7.45). That the core is the domain of case assignment in Icelandic can be seen most readily in sentences like (7.47).

(7.47)      *Jón-Ø*                      *tel-ur*                      *mér*                      (*í barnaskap sínum*) *haf-a*                      *alltaf*  
                  John-MsgNOM believe-3sgPRES 1sgDAT (in foolishness his)                      have-INF always  
                  *þótt*                      *Ólaf-ur*                      *leiðinleg-ur*.  
                  think.PSTP Olaf-MsgNOM boring-MsgNOM  
                  ‘John believes me (in his foolishness) to have always considered Olaf boring.’

What is crucial about this example is the occurrence of two nominative NPs, one in each core. If the core is the domain for the application of the case-marking

rules in (7.45), then the case pattern in (7.47) is accounted for, because *Jón* is the highest ranking macrorole in the matrix core and *Ólafur* is the highest ranking macrorole in the second, linked core. If the clause were the domain, then only one nominative NP would be possible, namely the highest ranking macrorole in the matrix core, *Jón*; all other macrorole arguments would be assigned accusative case, which they are not.

In English, on the other hand, because the clause is the domain of case assignment only the highest ranking macrorole in the matrix core can be nominative; all other macroroles are accusative. This is illustrated in (7.48).

- (7.48) a. Pat believed her to have told him to ask us to help them.  
 b. For her to hire them would shock us.

The (b) example is particularly interesting, because it contains no nominative NP at all. This is because the highest ranking macrorole argument, the actor, is realized by an infinitival core, *for her to hire them*, and cores functioning as arguments do not carry case in English and many other languages. In Huallaga Quechua (Weber 1989), on the other hand, embedded cores and clauses do carry accusative case.

Thus, languages vary with respect to the domain of case assignment: in Icelandic the rules apply independently in each core, while in English they apply to all of the cores in a clause jointly.

## 7.4 Linking in complex noun phrases

The primary issue regarding linking in complex NPs concerns relative clauses, in particular, the linking of the head noun to both the matrix clause and to the relative clause, since it functions in both. There are two main types of relative clauses, head-external and head-internal, and each presents a different linking problem: with head-external relatives, the problem is determining the function of the head inside the relative clause, whereas with head-internal relatives, the problem is determining which argument or adjunct in the relative clause also functions in the matrix clause. Within the class of head-external relatives, the two main types are those which have a relative pronoun, such as in English relative clauses with *who* or *which*, and those which have no relative pronoun and a gap in the relative clause, as exemplified by English sentences like *The man (that) I saw is a spy*. Linking in internally headed relative clauses will not be explicated here; see Van Valin and LaPolla (1997: section 9.3). The discussion will begin with the most common type cross-linguistically, externally headed relative clauses with no relative pronoun.

Both English and Malagasy have this type of relative clause, but Malagasy has an extra twist: there is a restricted neutralization with respect to the head noun of the relative clause (Keenan 1976), while English lacks such a restriction.

- (7.49) a. Na-hita ny vehivavy (izay) nan-asa ny zaza Rakoto.  
 PRFV.ATV-see DET woman CLM PRFV.ATV-wash DET child Rakoto  
 ‘Rakoto saw the woman that washed the child.’  
 \*‘Rakoto saw the woman that the child washed.’
- a'. Na-hita ny zaza (izay) nan-asa ny vehivavy Rakoto.  
 PRFV.ATV-see DET child CLM PRFV.ATV-wash DET woman Rakoto  
 ‘Rakoto saw the child that washed the woman.’  
 \*‘Rakoto saw the child that the woman washed.’
- a''. Na-hita ny zaza (izay) sas-an'ny vehivavy Rakoto.  
 PRFV.ATV-see DET child (CLM) wash-PASS-DET woman Rakoto  
 ‘Rakoto saw the child that was washed by the woman.’
- b. Trevor talked to the woman (that) Colin introduced him to.
- b'. Trevor talked to the woman \*(that) introduced Colin to him.

In the first two of the Malagasy examples, the head noun, which precedes the relative clause, can only be interpreted as the privileged syntactic argument of the relative clause; since Malagasy is an accusative language and the voice of the verb is active, it is always interpreted as the actor. In the third example it is interpreted as the undergoer, because the voice of the verb in the relative clause is passive. The only restriction that English has on this construction is that if the head noun is the privileged syntactic argument of the relative clause, as in (b'), then the clause-linkage marker *that* is obligatory; otherwise it is optional.

The logical structure for (7.49a) is given in (7.50a), while the one for (7.49a'') is given in (7.50b).

- (7.50) a. **see'** (Rakoto, [**be'** (vehivavy<sub>i</sub>, [**do'** (x<sub>i</sub>, [**wash'** (x<sub>i</sub>, zaza)]))]))
- b. **see'** (Rakoto, [**be'** (zaza<sub>j</sub>, [**do'** (vehivavy, [**wash'** (vehivavy, y<sub>j</sub>)]))]))

Following the convention introduced in section 2.3, the head noun in the complex nominal logical structure is indicated by the thick dashed underlining. The underlining indicates that *vehivavy* ‘woman’ will be interpreted as the argument of *-hita* ‘see’, not the entire logical structure, in (a); the same holds for *zaza* ‘child’ in (b). Restrictive relative clauses are attributive modifiers, and accordingly they will be represented in an attributive logical structure, **be'** (x, [**pred'**]), with the logical structure of the relative clause filling the ‘**pred'**’ slot in the attributive logical structure. While this is not a control construction, the same mechanism may be used for representing the function of the head noun within the logical structure of the relative clause; the head noun is coindexed with a lexically unfilled variable in the logical structure of the verb in the relative clause. In the linking from semantics to syntax, the head of the relative clause must be the privileged syntactic argument of the relative clause in Malagasy, and therefore if the head noun had been coindexed with a variable that would function as a non-actor, then passive or one of the other Malagasy voices would be necessary, as in (7.49a''). The linking from semantics to syntax in (7.49a) is illustrated in Figure 7.14.

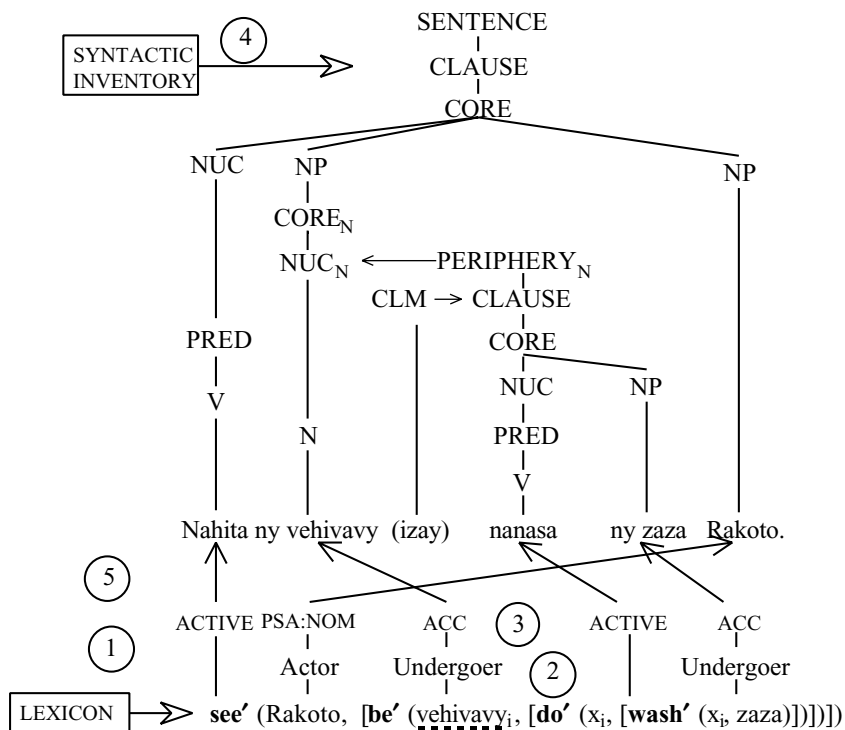


Figure 7.14 Linking from semantics to syntax in Malagasy relative clause in (7.49a)

The core template in the relative clause is missing a core argument position, one corresponding to the head noun, and so (7.44) must be revised to handle this. It already refers to syntactic arguments occurring in the precore slot, and this would account for relative clauses with relative pronouns. For other types of externally headed relative clause, however, there is no element in the precore slot, and therefore technically (7.44c3) does not apply to them. Since it is a universal feature of externally headed relative clauses that the core is missing an argument position when the head noun is a semantic argument of the verb or predicate in the relative clause, the relative clause provision to (b) should be added, rather than (c) in (7.44). Nothing needs to be said regarding cases in which the head noun is not an argument of the verb in the relative clause, because peripheral constituents are always optional in the syntactic templates. The revised version is given in (7.51).

- (7.51) a. Syntactic template selection principle (final formulation):  
 The number of syntactic slots for arguments and argument-adjuncts within the core is equal to the number of distinct specified argument positions in the semantic representation of the core.
- b. Universal qualification of the principle in (a):  
 The number of slots in a core is reduced by 1 if:

1. it is the matrix core in a non-subordinate core juncture in which the linked core is a semantic argument of the matrix verb, and
  2. it is the linked core in a non-subordinate core juncture;
  3. it occurs in an externally headed relative clause construction in which the head noun is a semantic argument of the predicate.
- c. Language-specific qualifications of the principle in (a):
1. All cores in the language have a minimum syntactic valence of 1.
  2. Argument-modulation voice constructions reduce the number of core slots by 1.
  3. The occurrence of a syntactic argument in the pre/postcore slot reduces the number of core slots by 1 (may override c1).

The main complication which relative clauses introduce to the linking from syntax to semantics is that when the relative clause is recognized, an attributive logical structure must be introduced into the argument position occupied by the head noun, with the head noun functioning as the first argument of it, and the logical structure of the verb in the relative clause filling the ‘**pred**’ slot in it. Since there will be an unlinked argument position in the semantics after all of the NPs in the clause are linked, the head must be linked to this position, in order to satisfy the completeness constraint. Hence it will be necessary to add a construction-specific condition to the linking specification in the constructional schema for relative clauses to deal with these additional complexities; this would be a general condition which all constructional schemas for externally-headed relative clauses would have. It can be formulated as in (7.52).

- (7.52) Conditions governing linking from syntax to semantics in externally headed relative clauses
- a. Retrieve from the lexicon an attributive logical structure and substitute the logical structure of the verb in the relative clause for the second argument.
  - b. Link the head noun to the first argument in the attributive logical structure.
  - c. Coindex the head noun in the attributive logical structure with either the unlinked argument position in the relative clause logical structure, or, if there is a relative pronoun, to the argument position linked to the relative pronoun.
  - d. Insert the attributive logical structure into the argument position in the matrix logical structure occupied by the head noun, underlining the head noun.

Provision for externally headed relative clauses with relative pronouns (see (7.53) below) is made in (7.52c). The steps in (7.52) would come into play as soon as a relative clause is encountered; the steps in (7.41) apply within the relative clause just as within the matrix clause.

The linking from syntax to semantics in (7.49a'') is given in Figure 7.15. Since Malagasy has a rich voice system, the first step is to determine the voice of the verb in the main clause; since it is active, we may conclude that the privileged

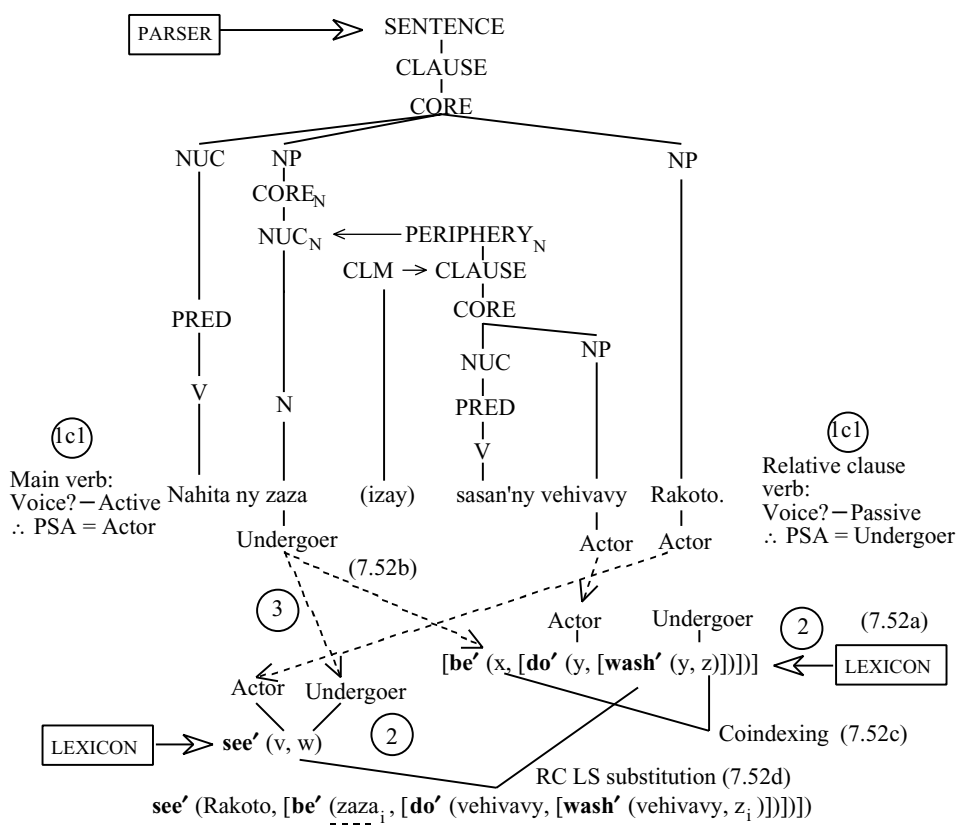


Figure 7.15 Linking from syntax to semantics in Malagasy relative clause in (7.49a'')

syntactic argument is the actor and that the NP immediately following the nucleus is the undergoer. With respect to the relative clause, the voice is passive, which means that the privileged syntactic argument is the undergoer and that the NP immediately following the nucleus is the actor. The head noun, *ny zaza* 'the child', is linked both to the second argument position in the logical structure of the matrix verb *-hita* 'see' and to the first argument position in the attributive logical structure containing the logical structure of the relative clause. Following (7.52c), the head noun in the first argument position in the attributive logical structure is coindexed with the unlinked argument in the relative clause logical structure. The logical structures of the main and relative clause verbs are related only indirectly through the common linking to the head noun. In the final step the *w* variable in the matrix logical structure is replaced with the attributive logical structure after the coindexing mandated by (7.52c), yielding the logical structure in (7.50b).

The constructional schema for Malagasy relative clauses is given in Table 7.7.



Table 7.7 *Constructional schema for Malagasy relative clause constructions*

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CONSTRUCTION: Malagasy relative clause construction

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SYNTAX:

Juncture: nuclear<sub>N</sub>

Nexus: subordination (peripheral)

Construction type: clausal modifier

Unit template(s): main clause: (7.51)

relative clause template: external head, [-PrCS], (7.51b2)

PSA: head noun = variable syntactic pivot of relative clause (4.15a,c1)

Linking: semantics → syntax – if actor ≠ PSA, then marked voice

syntax → semantics – (7.52)

MORPHOLOGY: CLM *izay* (optional)

SEMANTICS: restrictive modifier; **be'** ( $x_i$ , [**pred'** ( . . .  $y_i$  . . . )]), where  $y$  is lexically unfilled

PRAGMATICS:

Illocutionary force: none (outside of potential focus domain)

Focus structure: all elements are non-focal

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The logical structure of relative clauses with relative pronouns differs from those discussed above only in that instead of the logical structure of the verb in the relative clause containing a lexically unfilled variable, the WH-word fills that position and is coindexed with the head. An example of this type of relative clause from English and its logical structure are given in (7.53).

- (7.53) a. Pat liked the puppies which Kim saw.  
 b. **like'** (Pat, [**be'** (puppies <sub>$i$</sub> , [**see'** (Kim, which <sub>$i$</sub> )])])

The linking from semantics to syntax follows the linking algorithm in (7.1), and the relative pronoun is linked to the precore slot, just as a WH-word is in a WH-question. The linking for (7.53a) is given in Figure 7.16 on the next page. The linking from syntax to semantics parallels that for the Malagasy example, with the exception that instead of linking the head noun with an unfilled argument position in the logical structure of the relative clause, it is coindexed with the WH-word in it. This is given in Figure 7.17 also on the next page. The relationship between the two main logical structures is expressed by the coindexing required by (7.52c). In order to integrate the two logical structures, the first argument in the attributive logical structure must be coindexed with the argument in the embedded logical structure containing the relative pronoun, following (7.52c). The whole attributive logical structure then fills the matrix verb logical structure argument variable which was coindexed with the relative pronoun by (7.52c). The result of the linking, when all of the logical structures are integrated, is (7.53b). Several crucial steps in the linking are supplied by the construction-specific linking requirements in (7.52), which are stated in the constructional schema for English relative clauses given in Table 7.8 on p. 267.

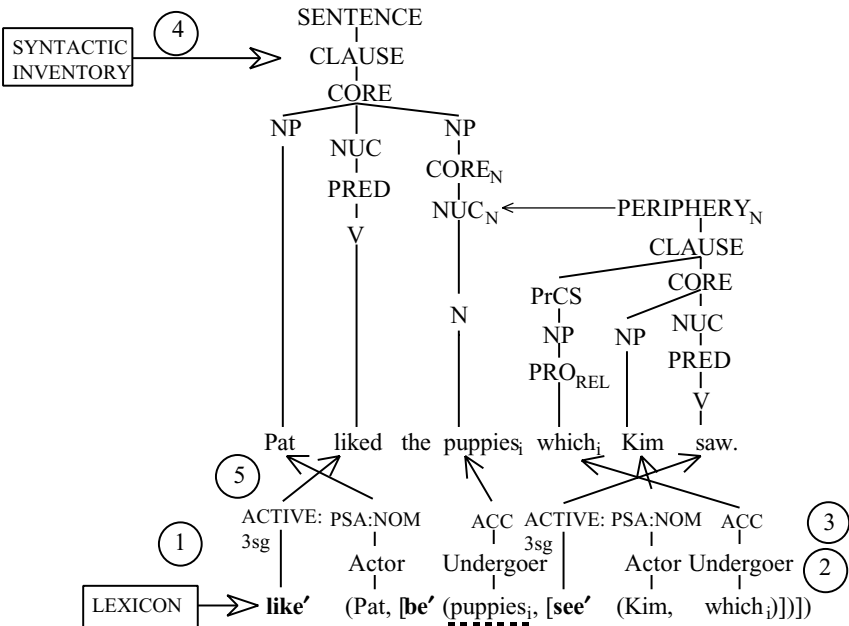


Figure 7.16 Linking from semantics to syntax in English relative clause in (7.53a)

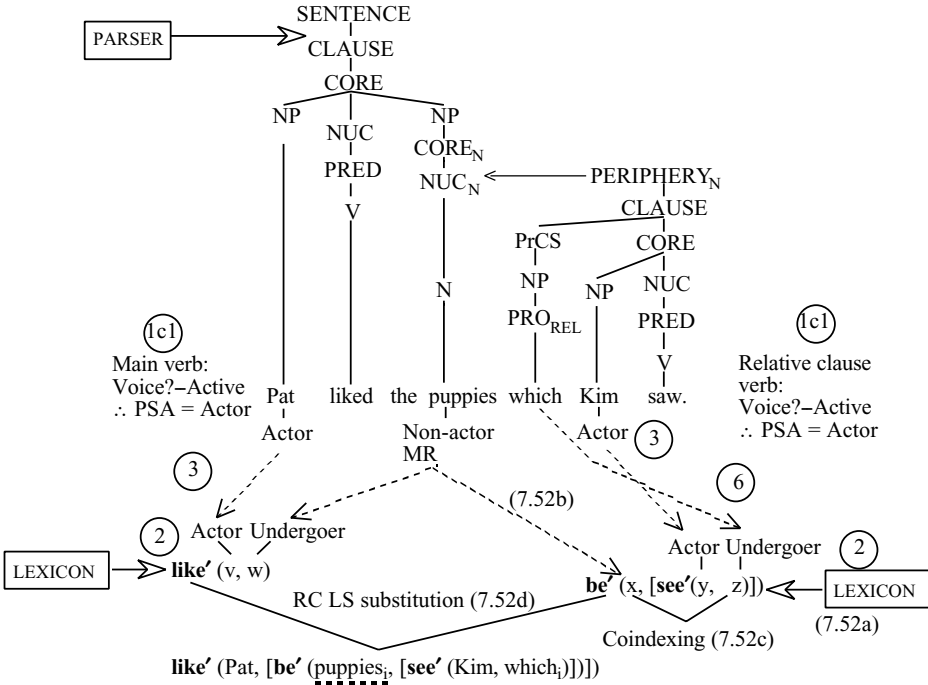


Figure 7.17 Linking from syntax to semantics in English relative clause in (7.53a)

Table 7.8 *Constructional schema for English relative clause constructions*

## CONSTRUCTION: English relative clause construction

## SYNTAX:

Juncture: nuclear<sub>N</sub>

Nexus: subordination (peripheral)

Construction type: clausal modifier

Unit template(s): Main clause: (7.51)

relative clause template: external head

relative clause: [ $\pm$ PrCS], (7.51b2)

PSA: none

Linking: syntax  $\rightarrow$  semantics – (7.52)MORPHOLOGY: CLM *that* (required if there is no relative pronoun and if head noun = PSA of subordinate clause; otherwise optional)SEMANTICS: restrictive modifier; **be'** ( $x_i$ , [**pred'** ( $\dots y_i \dots$ )]), where  $y$  is either a relative pronoun or lexically unfilled

## PRAGMATICS:

Illocutionary force: none (outside of potential focus domain)

Focus structure: all elements are non-focal

## 7.5 Reflexivization in complex sentences

In section 5.2 a set of principles was presented which govern reflexivization in simple sentences, i.e. constructions with a single nucleus in a single core in a single clause. They are repeated in (7.54).

- (7.54) a. Role hierarchy condition on reflexivization: (= (5.20))  
the reflexive pronoun must not be higher on (4.14) (as applied to selection of privileged syntactic arguments in the language in (4.15c,d)) than its antecedent.
- b. Logical structure superiority (LS-superiority) (= (5.27))  
A constituent P in logical structure is LS-superior to a constituent Q iff there is a constituent R in logical structure such that
- i. Q is a constituent of R, and
  - ii. P and R are primary arguments of the same logical structure.
- c. Superiority condition on reflexivization:  
a bound variable may not be LS-superior to its binder.
- d. Domain of obligatory reflexivization constraint: (= (5.29))  
one of two coreferring semantic co-arguments within a simple clause must be realized as a reflexive, while one of two coreferring syntactic arguments (which are not semantic co-arguments) within a simple clause may be realized as a reflexive.

Complex sentences present challenges to the hierarchy and domain conditions. With respect to the first issue, nuclear junctures create composite logical

structures; do all of the arguments in the derived logical structures behave like those in the logical structures of simple verbs? See Van Valin and LaPolla (1997: section 9.4.1), for detailed discussion. Matrix-coding constructions treat semantic arguments from different verbs as syntactic co-arguments; is reflexivization obligatory or optional in this instance? With respect to the domain condition, it is well known that some languages allow what is known as ‘long-distance reflexivization’, as illustrated in the following Icelandic example (Thránsson 1991).

- (7.55) Jón-Ø<sub>i</sub> sag-ð-i að ég hef-ð-i  
 John-MsgNOM say-PAST-3sg CLM 1sgNOM have.SBJ-PAST-1sg  
 svik-ið sig<sub>i</sub>.  
 betray-PSTP SELF  
 ‘John<sub>i</sub> said that I had betrayed himself<sub>i</sub>.’

The ungrammaticality of the English translation indicates that this construction is not found in English.

Core junctures raise a number of important questions. English does not appear to allow reflexivization across a core boundary within a clause containing a core juncture, but other languages do, as the following example from Icelandic (Maling 1986) illustrates; note again the ungrammaticality of the English translation.

- (7.56) Harald-ur<sub>i</sub> skipa-ð-i mér að rak-a sig<sub>i</sub>.  
 Harold-MsgNOM order-PAST-3sg 1sgDAT CLM shave-INF SELF  
 ‘Harold<sub>i</sub> ordered me to shave himself<sub>i</sub>.’

In (7.56) the controller and the reflexive are in different cores in the same clause. This seems to show that ‘within a simple clause’ in (7.54d) should be replaced by ‘within a core’. Control constructions of the type illustrated in (7.57) in English and other languages pose no problems for (7.54), however, since the controller and the reflexive are part of the same logical structure.

- (7.57) a. Max persuaded himself to call Dana.  
 b. Sally persuaded Tom to perjure himself.

The undergoer of *persuade* is a semantic argument of both verbs, and therefore it is a semantic co-argument of *Max* in (a) and of *himself* in (b). Hence both of these sentences meet the condition in (7.54d).

A construction which does present a problem for (7.54d) is reflexivization in the matrix-coding construction, as illustrated in (7.58).

- (7.58) a. Laura<sub>i</sub> believed herself<sub>i</sub>/\*her<sub>i</sub> to have been elected treasurer.  
 b. Miguel<sub>i</sub> believes himself<sub>i</sub>/\*him<sub>i</sub> to be the heir to the Spanish throne.

Even though *Laura* and *herself* are arguments of different logical structures, the role hierarchy condition as formulated in (7.54a) applies naturally here, since the actor of the matrix verb is the highest ranking argument in the logical structure.

Consequently, *\*Herself believed Laura to have been elected treasurer* is ruled out; since *herself* in this sentence is the actor of the matrix logical structure and *Laura* is the undergoer in the embedded logical structure, the reflexive is higher on (4.14) than the controller, violating (7.54a). On the other hand, reflexivization is obligatory in this construction, and yet the antecedent and the reflexive are not semantic co-arguments; *Laura* and *Miguel* are semantic arguments of *believe*, and the reflexive is a semantic argument of the embedded logical structure. Accordingly the problem is with the revised version of (7.54d). Replacing ‘semantic co-arguments within a core’ with ‘syntactic co-arguments within a core’, for example, would work fine for the sentences in (7.58) and (7.57a), but it would not work for (7.57b), since *Tom* and *himself* are in different cores, or for the sentences in (7.59), in which the antecedent and the reflexive are also in different cores.

- (7.59) a. Tanisha<sub>i</sub> seems to have injured herself<sub>i</sub>/*\*her*<sub>i</sub>.  
 b. Hamid<sub>i</sub> was believed to have recognized himself<sub>i</sub>/*\*him*<sub>i</sub> in the picture.

If the restriction were changed to ‘syntactic co-arguments within a clause’, which would cover all of these cases, then there would be no explanation for the ungrammaticality of the English equivalent to (7.56), *\*Harold ordered me to shave himself*. The primary difference between this sentence and the ones in (7.57b) and (7.59) is that the antecedent and the reflexive are not semantic co-arguments in *\*Harold ordered me to shave himself*, while they are semantic co-arguments in (7.57b) and (7.59). This strongly suggests that in English the domain restriction on the reflexivization of semantic co-arguments is different from the domain restriction on the reflexivization of co-referring syntactic arguments which are not semantic co-arguments. Thus, the domain restrictions seem to be as in (7.60).

- (7.60) Domain restrictions on obligatory reflexivization in English:  
 a. Co-referring semantic co-arguments: can be in different cores within a clause  
 b. Co-referring syntactic co-arguments which are not semantic co-arguments: cannot be in different cores within a clause (one may be in PrCS with co-argument in the adjacent core)

This contrast falls out from the linking algorithms for complex sentences, in particular the syntax to semantics linking algorithm in (7.2). Semantic co-arguments are by definition part of the same logical structure in the semantic representation of the sentence, and therefore it is possible to recover their semantic co-argumenthood across core boundaries in non-subordinate core junctures but not across clause boundaries, since clauses link independently of each other. In matrix-coding constructions like (7.58), the controller in the matrix core is linked to an argument position in the same logical structure as the reflexive; hence, even if they are in different cores, the controller and the reflexive will be linked to argument positions in the same logical structure. In control constructions like

(7.57b), in which the controller and the reflexive are in different cores, the theory of control in (7.29) links the controller in the matrix core to an argument position in the same logical structure as the reflexive. This is not the case in *\*Harold ordered me to shave himself*, however; *Harold* is a semantic argument of *order* and *himself* of *shave*. They are not semantic co-arguments and are not in the same core, and therefore the sentence is ungrammatical. Because the obligatory sharing of a semantic argument in non-subordinate core junctures is the basis of the semantic co-argumenthood across a core boundary, this analysis predicts that reflexivization across core boundaries should not be possible in core subordination, due to the lack of any argument sharing, and this is correct, as (7.61) shows.

- (7.61) a. *\*Dana<sub>i</sub> regretted Bob's kissing herself<sub>i</sub>.*  
 b. *\*Debra<sub>i</sub> wanted very much for Sam to kiss herself<sub>i</sub>.*

It may be predicted, then, that the clause will universally be the syntactic domain for obligatory reflexivization of semantic co-arguments. On the other hand, there is nothing in the linking system that would constrain the interpretation of syntactic (co-)arguments which are not semantic co-arguments, and therefore it may be predicted that languages will vary quite substantially with respect to the treatment of syntactic arguments of this type. This is exactly what is seen in (7.56): in Icelandic coreferring syntactic co-arguments which are not semantic co-arguments can have a domain larger than a core, while in English they cannot. Indeed, Icelandic reflexivization is not even restricted by clause boundaries in some cases, as (7.55) shows.

It is necessary, then, to reformulate the domain of obligatory reflexivization constraint for English in (7.54d) as in (7.62).

- (7.62) Obligatory reflexivization constraint in English:
- a. For semantic co-arguments, the domain of obligatory reflexivization is the clause: one of two coreferring core arguments which are semantic co-arguments must be realized as a reflexive.
  - b. For coreferring syntactic co-arguments that are not semantic co-arguments, the domain of possible reflexivization is the core (and the precore slot):
    - (1) if they are both direct arguments, then one of them must be realized as a reflexive;
    - (2) if the lower ranking one in terms of (7.54a) is an argument-adjunct, then it may optionally be realized as a reflexive, subject to semantic conditions.

The condition in (a) accounts for the sentences in (7.57) and (7.59); the condition in (b1) accounts for the obligatory reflexives in (7.58), while the one in (b2) accounts for the pattern of reflexivization in (5.19b,c). The semantic condition of affectedness, proposed by Kuno and discussed in section 5.3, accounts for the impossibility of the reflexive in (5.19b) and its possibility in (5.19c). Thus, it appears that English does in fact have a type of long-distance reflexivization,

namely reflexivization involving semantic co-arguments across a core boundary. It does not, however, have long-distance reflexivization involving syntactic arguments which are not semantic co-arguments, unlike Icelandic and many other languages.

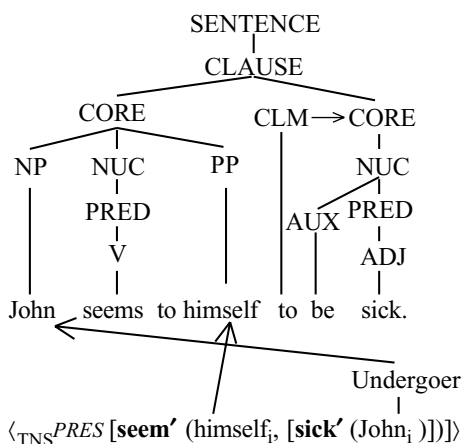
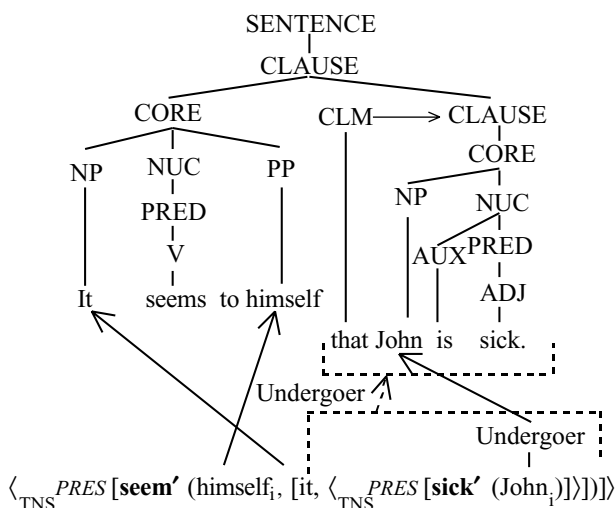
There is a group of matrix-coding examples which raise a rather different problem for the principles in (7.54); they are given in (7.63) along with simplified semantic representations.

- (7.63) a. John seems to himself to be sick.  
 a'.  $\langle_{\text{TNS}} \text{PRES} [\text{seem}' (\text{himself}_i, [\text{sick}' (\text{John}_i)])]\rangle$   
 b. John is certain to appear to himself to be sick.  
 b'.  $\langle_{\text{TNS}} \text{PRES} [\text{certain}' (\text{appear}' (\text{himself}_i, [\text{sick}' (\text{John}_i)]))]\rangle$   
 c. \*It seems to himself that John is sick.  
 c'.  $\langle_{\text{TNS}} \text{PRES} [\text{seem}' (\text{himself}_i, [\text{it}, \langle_{\text{TNS}} \text{PRES} [\text{sick}' (\text{John}_i)])]\rangle]\rangle$

The sentences in (7.63a,b) are interesting for two reasons. First, they have been cited as evidence against semantic accounts of reflexivization and in favor of syntactic accounts involving movement and traces, and second, native speakers have quite variable reactions to them, with some finding them fine and others finding them ungrammatical. Is it possible to account for both types of native speaker reactions within the framework of (7.54)?

At first glance it might appear that (7.63a,b) violate the role hierarchy condition in (7.54a), since the reflexive seems to be higher on (4.14) than the controller. This, however, is an illusion. As argued in section 5.3, the hierarchy for English is actor > undergoer > other, and in these examples *John* is an undergoer and *himself* is a non-macrorole oblique core argument. Consequently, the binding is 'undergoer binds other', which follows (7.54a). The problem lies in (7.54c), the superiority condition: the reflexive appears to be LS-superior to its controller. This is not necessarily the case, however, and herein lies the crux of the different native speaker reactions. For those who find these sentences ungrammatical, the interpretation of (7.63a,b) with respect to (7.54b,c) is that because (1) *himself* is an argument of the matrix predicate **seem'** and (2) *John* is the single argument of the embedded predicate **sick'**, *himself* is LS-superior to *John*, and the binding violates the superiority condition. There is, however, another way to view the linking in these sentences. Because these are matrix-coding constructions, the embedded predicate **sick'** and its argument *John* link independently and not as a unit. Hence for linking purposes *John* is not treated as part of the second argument of *seem*. This is illustrated in Figure 7.18 on the next page. This linking contrasts sharply with that in (7.63c), in which *John* and **sick'** link as a unit, because the nexus is subordinate. This is illustrated in Figure 7.19.<sup>4</sup> In this sentence *John is sick* links as a single unit, and therefore the superiority condition is unambiguously violated, rendering the sentence ungrammatical. Thus, speakers

<sup>4</sup> See Van Valin and LaPolla (1997: section 9.1.1), for discussion of the semantic representation of sentences involving extraposition.

Figure 7.18 *Linking from semantics to syntax in (7.63a)*Figure 7.19 *Linking from semantics to syntax in (7.63c)*

who find (7.63a,b) grammatical are interpreting the linking in such a way that the superiority condition is not violated, while those who reject them are construing it in such a way that the condition is contravened.

## 7.6 Constraints on linking in WH-questions and related constructions

In the discussion of linking in WH-questions in chapter 5, it was noted that the WH-word can be mapped into the syntactic representation in one



of four ways: into the precore slot, as in English; into the postcore slot, as in Dhivehi (Cain and Gair 2000); into the normal position for an NP argument or PP adjunct, as in Lakhota; or into the core-internal focus position, as in Turkish. There was no discussion of any restrictions on the linking from syntax to semantics, because there seem to be few if any of them in simple sentences. The picture is very different in complex sentences. Consider the following examples involving complex NPs.

- (7.64) a. Mulder believes that Scully hid the files.  
       a'. What does Mulder believe that Scully hid?  
       b. Mulder believes the rumour that Scully hid the files.  
       b'. \*What does Mulder believe the rumour that Scully hid?  
       c. Scully interviewed the witness who saw the alien spacecraft.  
       c'. \*What did Scully interview the witness who saw?

It is grammatical in English to form a WH-question with the question word functioning as the undergoer of the embedded clause, when the embedded clause is an object complement, as in (a'). When the embedded clause is a noun phrase complement, as in (b), or a relative clause, as in (c), the result is very different, as (b') and (c') clearly show. Ross (1967) argued that NP complements and relative clauses share a common structural feature, namely, the subordinate clause is embedded within a complex NP with a lexical head noun, and it is this property which blocks question formation. It also blocks the formation of related constructions, namely topicalization and relativization, as illustrated in (7.65).

- (7.65) a. Those files Mulder believes Scully hid.  
       a'. \*Those files Mulder believes the rumour that Scully hid.  
       a''. \*The alien spacecraft Scully interviewed the witness who saw.  
       b. The files which Mulder believes that Scully hid were actually in the trunk of his car.  
       b'. \*The files which Mulder believes the rumour that Scully hid were actually in the trunk of his car.  
       b''. \*The alien spacecraft which Scully interviewed the witness who saw is stored in an abandoned missile silo in North Dakota.

The explanation proposed for these restrictions is the general principle of *subjacency* (Chomsky 1973). This principle has undergone a number of reformulations over the past three decades, but the basic idea is still that movement transformations cannot move an element across particular structural configurations. The idea that subjacency violations like those in (7.64b',c') and (7.65a',a'',b',b'') are caused by a syntactic rule moving an element across more than one bounding node runs into difficulties in languages like Lakhota in which questions words do not appear in the precore slot but rather occur in the normal core-internal position for a corresponding non-WH element, i.e. *in situ*. This might lead one to expect that there

would be no subadjacency violations in such a language, but this is incorrect, as the following Lakhota examples show.

- (7.66) a. Wičháša ki [[šýka wá igmú ki Ø-Ø-yaxtáke] ki le] wá-Ø-Ø-yáke yelo.  
 man the dog a cat the 3sgU-3sgA-bite the this 3sgU-3sgA-see DEC  
 'The man saw the dog which bit the cat.'
- b. Wičháša ki [[šýka wá táku Ø-Ø-yaxtáke] ki le] wá-Ø-Ø-yáke yelo.  
 man the dog a 3sgU-3sgA-bite the this 3sgU-3sgA-see DEC  
 'The man saw the dog which bit something.'
- c. Wičháša ki [[šýka wá táku Ø-Ø-yaxtáke] ki le] wá-Ø-Ø-yáke he?  
 man the dog a 3sgU-3sgA-bite the this 3sgU-3sgA-see Q  
 'Did the man see the dog which bit something?'  
 \*'What did the man see the dog which bit?'

In (b) the undergoer of the relative clause has been replaced by *táku* 'what, something (specific)', and the result is a sentence with an indefinite-specific undergoer. In (c), the crucial example, the sentence has the question particle *he* and must be interpreted as a question. In section 5.4.3 it was mentioned that simple Lakhota sentences with *táku* and the question particle *he* are ambiguous between WH-question and yes–no question interpretations, as (5.40d) showed; it is repeated below.

- (7.67) Šýka ki táku Ø-Ø-yaxtáka he?  
 dog the 3sgU-3sgA-bite Q  
 'What did the dog bite?', or 'Did the dog bite something?'

What is striking about (7.66c) is that it is *unambiguous*, even though it might be expected to be ambiguous just like (7.67). It cannot have the WH-question interpretation, unlike (7.67); it can only have the yes–no question reading. Put another way, *táku* cannot be interpreted as a question word in (7.66c); it can only be interpreted as an indefinite-specific pronoun. This is a subadjacency effect, just as in (7.64c') in English; in both examples, it is impossible to form a WH-question if the WH-word functions as (in these cases) a semantic argument in a definite restrictive relative clause.

This is a very important fact. The account in terms of subadjacency crucially refers to the movement of WH-words and other elements across certain phrase-structure configurations; the result of this movement is a long-distance dependency between the WH-word and a syntactic 'gap' in an embedded clause which spans these configurations. English, which has been analysed as having syntactic movement rules due to the displacement of the WH-word to the precore slot, shows subadjacency effects, as demonstrated in (7.64) and (7.65). Lakhota, which presents no *prima facie* evidence for the existence of displacement in its grammar, also shows subadjacency effects, as in (7.66c). Hence languages with 'movement' show subadjacency effects, and languages without 'movement' also show subadjacency

effects. It may, therefore, be concluded that ‘movement’ (displacement) is *irrelevant* to the explanation of these subjacency effects. It is necessary to look for some other feature common to the grammars of both types of languages for the explanation.

An important clue to what this feature could be comes from the Lakhota sentence in (7.67). In section 5.4.3, it was argued that the two interpretations of this sentence result from different construals of what the focus of the question is. That is, if the focus of the question is on *táku*, then it is interpreted as a question word, yielding the meaning ‘What did the dog bite?’ If, on the other hand, the focus is on another constituent, then *táku* must be construed as an indefinite-specific pronoun, resulting in the reading ‘Did the dog bite something?’ If the question word being the focus of the question is the crucial precondition for the WH-question interpretation, then it follows that the reason (7.66c) is not ambiguous is that it is impossible to interpret *táku* as the focus of the question, leaving only the yes–no question reading possible. Why should it be impossible to interpret *táku* as the focus of the question? In section 3.3 the notion of the *potential focus domain* was introduced, the part of the sentence in which focal elements can occur; the actual focus domain, where focal elements actually occur in a particular utterance, must be within the potential focus domain. With respect to (7.66c), if *táku* cannot be the focus of the question, then there is no possible utterance in which it is in the actual focus domain, and from this it follows that it must be outside the potential focus domain of the sentence.

The idea that some types of embedded clause are outside the potential focus domain is one encountered originally in section 6.7 in the discussion of focus structure in complex sentences. In that section a general principle governing the extent of the potential focus domain in complex sentences was introduced in (6.50), taken from Van Valin (1993b, 1995); it is repeated in (7.68).

- (7.68) The potential focus domain in complex sentences:  
 The potential focus domain extends into a subordinate clause if and only if the subordinate clause is a direct daughter of (a direct daughter of) the clause node which is modified by the illocutionary force operator.

As discussed in section 6.7, there is no limit in principle to the number of direct daughters involved, and accordingly the specification in parenthesis should be considered to be recursive. In terms of cross-linguistic variation, there appear to be only two possibilities: the potential focus domain is restricted to main clauses only, in which case (7.68) is irrelevant to the language, or the potential focus domain can extend into the deepest subordinate clause in any sentence, as long as the condition is not violated.

The application of the principle in (7.68) to the Lakhota examples in (7.66) begins with an analysis of the structure of the sentences. The structure of Lakhota relative clauses was given in (B) in Figure 6.26. In addition, two more

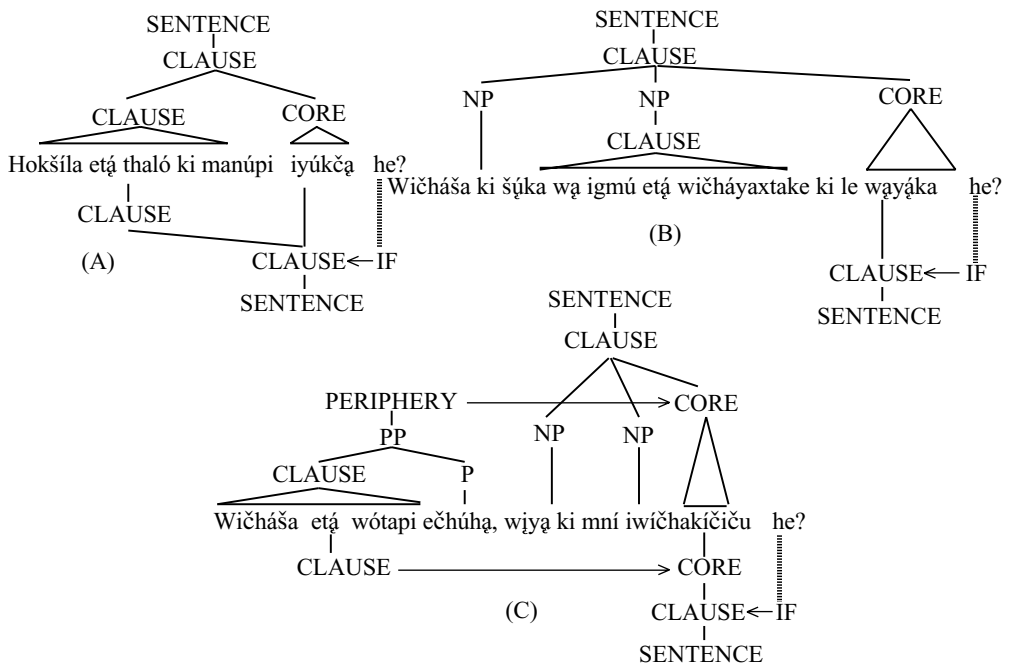


Figure 7.20 *The structure of Lakhota complex sentences in (7.66c) and (7.69)*

complex sentence types were given in Figure 6.26; these structures are repeated in (7.69).

- (7.69) a. [Hokšíla etá thaló ki ma-Ø-Ø-nú-pi] i-Ø-Ø-yúkčā he?  
 boy some[-SPEC] meat the INAN-3A-steal-pl INAN-3sgA-think Q  
 'Does he think some boys stole the meat?'
- b. Wičháša etá Ø-wóta-pi ečhúhā, wíyā ki mní i-Ø-wíčha-Ø-kičiču he?  
 man some 3A-eat-pl while woman the water INAN-3plU-3sgA-get.for Q  
 'While some men were eating, did the woman get them water?'

Simplified representations of each construction were given in Figure 6.26; they are repeated in Figure 7.20. In (A), the embedded clause is a direct daughter of the clause modified by the illocutionary force operator, and, consequently, the constituents of the embedded clause are within the potential focus domain. In (B) and (C), on the other hand, the embedded clause is not a direct daughter of the clause modified by the illocutionary force operator, and therefore the constituents of the embedded clauses are outside the potential focus domain. This conclusion is independently confirmed by the distribution of the indefinite-non-specific articles and by the possible felicitous responses to yes–no questions in these same complex sentences (cf. (6.53)–(6.57)). The fact that the relative clause in B is outside the potential focus domain predicts the impossibility of a WH-question reading in (7.66c). The results of the application of (7.68) to the structures in Figure 7.20 is given in (7.70).

- (7.70) Summary of potential scope of *he*: potential focus domain (in boldface)
- a. [**Hokšíla** **etá** **thaló ki manúpi**] **iyúkčə** he?  
 boys some meat the steal think Q  
 'Does he think some boys stole the meat?'
  - b. **Wičháša ki** [[šúka wə igmú etá wičháxaytake] **ki le**] **wəyáka** he?  
 man the dog a cat some bite the this see Q  
 'Did the man see the dog which bit some cats?'
  - c. [Wičháša ki wóte] **ečhúhə, tha-wíču ki mní ikíčiču** he?  
 man the eat while his-wife the water get.for Q  
 'While the man was eating, did his wife get him water?'

Only in (7.70a) do the individual constituents of the embedded clause function as independent information units; in (7.70b,c), on the other hand, the embedded clauses as a whole count as single information units. The internal constituents of the embedded clauses in these sentences are not included in the potential focus domain.

The explanation for the impossibility of the WH-question interpretation of *táku* when it is in a definite restrictive relative clause makes a specific prediction about object complements and adverbial clauses: words like *táku* should be construable as question words in object complements but not in adverbial clauses. These predictions are correct, as (7.71) shows.

- (7.71) a. [Tuwá thaló ki manú] **iyúkčə** he?  
 who meat the steal think Q  
 'Who does he think stole the meat?', or 'Does he think someone stole the meat?'
- b. [Wičháša ki **táku yúte**] **ečhúhə, tha-wíču ki mní ikíčiču** he?  
 man the eat while his-wife the water get.for Q  
 'While the man was eating something, did his wife get him water?'  
 \*'What did his wife get him water, while the man was eating?'

It is clear, then, that in order for *táku*, *tuwá* or one of the other question words/indefinite-specific pronouns in Lakhota to be interpreted as a question word, it must occur in the potential focus domain of the sentence. This may be expressed in a preliminary fashion as the constraint on question formation in (7.72).

- (7.72) Constraint on question formation (preliminary formulation):  
 The element questioned (the question word in a simple, direct WH-question<sup>5</sup> or the focal NP in a simple, direct yes–no question) must function in a clause into which the potential focus domain of the sentence extends.

It was shown in section 6.7 that the possible interpretation of the focus in a yes–no question is affected by the constraint in (7.68), and therefore the restriction in (7.72) applies to both types of questions. Thus, the principles in (7.68) and (7.72) provide an explanation for the observed subjacency effects in Lakhota.

<sup>5</sup> This constraint does not apply to echo questions, rhetorical questions or metalinguistic questions.

Can this analysis be applied to languages like English, in which questions words do not occur *in situ* but rather in the precore slot? In languages of this type, the position of the WH-word in the question is not relevant to explaining the subadjacency effects, because in all questions of this kind the WH-word occurs in the precore slot, regardless of the grammaticality of the question. Rather, what is relevant is whether the potential focus domain extends into the clause in which the question word functions semantically. In applying the principle in (7.68) to English in section 6.7, it was found that the potential focus domain extends into object complements (see Figure 6.24) but not into ad-core subordinate clauses (see Figure 6.25). If the principle in (7.68) is applied to the English relative clause in Figure 7.16, it is readily apparent that the embedded clause is not a direct daughter of the clause modified by the illocutionary force operator, and therefore relative clauses in English, as in Lakhota, function as a single information unit.<sup>6</sup> Finally, given the structure of the noun complement clause in Figure 6.27, the embedded clause is within a NP and therefore could not be a direct daughter of the clause modified by the illocutionary force operator; accordingly, it too counts as a single information unit. These results may be summarized in Table 7.9. With respect to the examples in (7.64), the results in Table 7.9 together with the principle in (7.72) account for the grammaticality or ungrammaticality of all of the sentences. Forming a question in which the WH-word functions in an object complement, as in (7.64a') is grammatical, as predicted, whereas forming a question in which the WH-word functions in a relative clause or noun complement clause, as in (c') and (b'), respectively, is ungrammatical, again as predicted. It also explains the ungrammaticality of the English translation of the Lakhota example in (7.71b), where the WH-word functions in an ad-core subordinate clause.

Table 7.9 *Potential focus domain in English complex sentence constructions*

Construction	Structure represented	Direct daughter?	Potential focus domain?
Object complement	Figures 6.17, 6.24,	Yes	Yes
Ad-core clauses	Figure 6.25	No	No
Relative clause (rest.)	Figures 6.28, 7.16,	No	No
Noun complement	Figure 6.27	No	No

An explanation has been provided for the subadjacency effects in both English and Lakhota which does not require the existence of a long-distance dependency between a WH-word in the precore slot and a syntactic ‘gap’ in an embedded clause. Rather, what is common to the two languages is the crucial role of the potential focus domain in constraining question formation. This is captured in the principles in (7.68) and (7.72), which apply equally to both languages, despite their

<sup>6</sup> Non-restrictive relative clauses would also be outside the potential focus domain, since they do not meet the structural condition in (7.68), and in addition, because they are embedded sentences, they have their own illocutionary force operator, which is obligatorily declarative (see Figure 6.29); they are a distinct focus domain from that of the matrix clause. Hence extraction should be impossible out of them, which is the case.

manifest syntactic differences. The principle in (7.72) can be integrated naturally into the linking algorithms. In order to block the generation of sentences like (7.64b'), it is necessary to modify step 5b of the semantics to syntax algorithm as in (7.73); the modification is in boldface.

- (7.73) Linking algorithm: semantics  $\rightarrow$  syntax (Revised)
1. Construct the semantic representation of the sentence, based on the logical structure of the predicator.
  2. Determine the actor and undergoer assignments, following the actor–undergoer hierarchy in Figure 4.4.
  3. Determine the morphosyntactic coding of the arguments
    - a. Select the privileged syntactic argument, based on the privileged syntactic argument selection hierarchy and principles in (4.14)–(4.15).
    - b. Assign the argument(s) the appropriate case markers and/or adpositions.
    - c. Assign the agreement marking to the main or auxiliary verb, as appropriate.
  4. Select the syntactic template(s) for the sentence following the principles in (7.51).
  5. Assign argument(s) to positions in the syntactic representation of the sentence.
    - a. Assign the [–WH] argument(s) to the appropriate positions in the clause.
    - b. If there is a [+WH] argument **in the semantic representation of a clause into which the potential focus domain extends**,
      1. assign it to the normal position of a non-WH-argument with the same function, or
      2. assign it to the precore or postcore slot, or
      3. assign it to a position within the potential focus domain of the clause (default = the unmarked focus position).
    - c. A non-WH argument may be assigned to the precore or postcore slot, subject to focus structure restrictions (optional).
    - d. Assign the arguments(s) or logical structure in logical structure(s) other than that of the predicator in the nucleus to
      1. a periphery (default)
        - a. If the representation is **pred'** (NP/LS, LS<sub>MAIN</sub>), where **pred'** is a prepositional predicate, then assign the P + NP/Core/Clause to the periphery<sub>CORE</sub>.
        - b. If the representation is LS<sub>MAIN</sub> **pred'/CONNECTIVE'** NP/LS, then assign the P + NP or CLM + Clause to the periphery<sub>CLAUSE</sub>.
      2. the precore or postcore slot, or
      3. the left- or right-detached position.

The addition of the requirement 'in the semantic representation of a clause into which the potential focus domain extends' makes it impossible to link a WH-word to any position in the syntactic representation if this condition is not met, resulting in a completeness constraint violation. This condition in step 5b

requires that focus structure information be available to the linking system, as in Figure 5.35. In order to constrain the linking from syntax to semantics, it is necessary to modify step 6 in (7.2) as follows.

- (7.74) Linking algorithm: syntax  $\rightarrow$  semantics (revised formulation)
1. Determine the macrorole(s) and other core argument(s) in the clause.
    - a. If the verb is intransitive, then assign the privileged syntactic argument either macrorole or direct core argument status, depending upon the language (language-specific)
    - b. If the verb is transitive and the language lacks voice oppositions, determine the macroroles from case marking and/or word order (language-specific).
    - c. If the language has a voice opposition, determine the voice of a transitive verb (language-specific):
      1. If the construction is syntactically accusative:
        - a. If it is the unmarked voice, the privileged syntactic argument is actor.
        - b. If it is passive, the privileged syntactic argument is not the actor of the predicate in the nucleus;
          1. the actor may appear as a direct core argument (language-specific); or
          2. the actor may appear in the periphery<sub>CORE</sub> marked by an adposition or an oblique case (language-specific); or
          3. if there is no actor in the core or the periphery, then replace the variable representing the highest ranking argument in the logical structure with 'Ø'.
      2. If the construction is syntactically ergative:
        - a. If it is the unmarked voice, the privileged syntactic argument is undergoer.
        - b. If it is antipassive, the privileged syntactic argument is actor;
          1. the undergoer may appear as a direct core argument or as an oblique element (language-specific);
          2. If there is no undergoer in the core or the periphery<sub>CORE</sub>, then replace the variable representing the lowest ranking argument in the logical structure with 'Ø'.
      3. assign macrorole status to the other direct core argument, if it is not dative or in an oblique case (language-specific).
    - d. If the language is head-marking and there are independent NPs in the clause, associate each NP with a bound argument marker (language-specific).
  2. Retrieve from the lexicon the logical structure of the predicate in the nucleus of the clause and with respect to it execute step 2 from (7.73), subject to the following proviso:
    - a. If the language allows variable undergoer selection and if there is more than one choice for undergoer, do not assign undergoer to an argument in the logical structure.
    - b. Determine the linking of the non-macrorole core argument:



1. If there is a two-place state predicate in the logical structure and if the non-macrorole core argument is marked by a locative adposition or dative or a locative-type case, then link it with the first argument position in the state predicate in the logical structure and link the other non-actor core argument (if there is one) to the second argument position in the state predicate, or
2. If there is a two-place state predicate in the logical structure and if the non-macrorole core argument is not marked by a locative adposition or dative or a locative-type case, then link it with the second argument position in the state predicate and link the other non-actor core argument (if there is one) to the first argument position in the state predicate.
3. Otherwise, link the animate NP with the first argument position in the state predicate in the logical structure.
3. Link the arguments determined in step 1 with the arguments determined in step 2 until all core arguments are linked.
4. In non-subordinate core junctures, one of the arguments of the matrix core must be linked to an argument position in the embedded logical structure:
  - a. If the matrix predicate is a control verb, this follows (7.29); otherwise,
  - b. If the matrix predicate is not a control verb, then link the unlinked syntactic argument in the matrix core to the logical structure argument position of the pivot of the linked core.
5. If there is an adjunct phrase in a periphery,
  - a. and if it is in the periphery<sub>CORE</sub>, then retrieve the logical structure of the predicative adposition from the lexicon, insert the logical structure of the core as the second argument in the logical structure and the object of the adposition as the first argument;
  - b. and if it is in the periphery<sub>CLAUSE</sub>, then link the adjunct PP or clause logical structure to the matrix logical structure via the semantic representation of the adposition or clause-linkage marker.
- 6. If there is an element in the pre- or postcore slot, or a WH-word *in situ* (language-specific),**
  - a. assign it the remaining unlinked argument position in the semantic representation of the sentence, provided that the logical structure to which it is linked is for a clause into which the potential focus domain extends.**
  - b. if there are no unlinked argument positions in the sentence, then treat the WH-word like a predicative preposition and follow the procedure in step 5.**
    - 1. Treat the entire logical structure of the sentence as the linked part of the prepositional or clause-linkage marker logical structure (default); or**
    - 2. If the potential focus domain extends into the embedded clause, then treat only the logical structure of the embedded clause as the linked part of the prepositional or clause-linkage marker logical structure (optional).**

The constraint in step 6a prevents a WH-word from being linked to the semantic representation unless the condition in (7.72) is met. In a language like English it would leave the WH-word stranded in the precore slot, resulting in a completeness constraint violation. In a language like Lakhota, on the other hand, it would block the linking if *táku* is construed as a question word, likewise resulting in a completeness constraint violation. But there is another option in Lakhota; *táku* can also be interpreted as an indefinite-specific pronoun, and on this interpretation the condition in (7.72) does not apply, thereby allowing the linking of *táku* to a variable in the logical structure, satisfying the completeness constraint, and yielding the yes–no question reading.

The reformulation of step 6b makes it possible to capture well-known constraints on the interpretation of adjunct WH-questions, as exemplified in (7.75).

- (7.75) a. When did Skinner say that Krycek would be at the missile silo?  
       b. When did Scully interview the witness who saw the alien spacecraft in the silo?

The sentence in (a) is ambiguous; it can be a question about when something was said or about when someone would be somewhere. The sentence in (b), however, is not ambiguous; it can only be a question about when the interview took place, not about when someone saw something. The issue here is again what can be questioned: more specifically, what can be questioned with respect to the time of its occurrence. It would be expected, then, that the potential focus domain would play a key role in constraining the interpretation of the question, and this seems to be the case. Example (7.75a) involves a structure which is compatible with the potential focus domain extending into the embedded clause, and accordingly it is ambiguous with respect to the interpretation of the scope of *when*. The structure in (b), however, does not meet the condition in (7.68) (cf. Table 7.9), and therefore the potential focus domain does not extend into the embedded clause; hence it cannot be the focus of the question, and *when* must be interpreted as modifying the matrix clause.

Ad-clausal subordinate clauses have an interesting property not shared with ad-core subordinate clauses. They are like ad-core clauses in that extraction out of them is impossible, since they do not satisfy the principle in (7.68); they are a ‘sister’ of the clause node modified by the illocutionary force operator, not a daughter (see Figure 6.7). The impossibility of extraction out of them is illustrated in (7.76).

- (7.76) a. \*Who was John upset, because Mary kissed —?  
       b. \*Who would John cry, if Mary had been seeing —?  
       c. \*Who was Mary happy, even though John had kissed —?

However, like object complements, which are daughters of the matrix clause node, and unlike ad-core subordinate clauses, ad-clausal subordinate clauses do allow inversion; the following examples are from Haumann (1997).

- (7.77) a. She said that [under no circumstances] would she marry him.  
 b. Max thinks that [because Tom left early] he was angry at him.  
 c. He left early because [never again] does he want to end up completely drunk.  
 d. Bill would cry if [while in London] Mary had been seeing John.  
 e. \*I haven't talked to him since [when I least expected it] he got divorced.  
 f. \*He got ill while [in Italy] he was on holiday.

It has been recognized since at least Hooper and Thompson (1973) that inversion is a property of asserted clauses, and for an embedded clause to be asserted, it must be within the potential focus domain. The principle in (7.68) correctly predicts the grammaticality of (7.77a,b) and the ungrammaticality of (7.77e,f), but it fails to predict the grammaticality of (7.77c,d). Moreover, there is something of a paradox here: extraction is impossible out of these clauses, which follows from them being outside of the potential focus domain, while inversion is possible in them, which follows from them being within the potential focus domain. How can this apparent paradox be resolved?

Bickel (1993) suggests that the potential focus domain (and therefore the actual focus domain) can be in either the main clause or the ad-clausal subordinate clause but not both in this construction. He calls this a 'Rubin effect', which is the famous phenomenon from Gestalt psychology whereby an ambiguous figure, e.g. a duck-rabbit, can be seen as only one form or the other at any given instant. In order to extract out of an ad-clausal subordinate clause, the potential focus domain has to encompass both clauses, which he argues is impossible. In a normal extraction out of an embedded clause, the potential focus domain includes the whole structure, with the actual focus domain being in the embedded clause.

Why should there be such a 'Rubin effect' with this construction? Why should it be impossible for the potential focus domain to encompass both clauses? A clue can be found in the semantic representation of these constructions, which is given in (6.38). An examination of the representations in (6.38) reveals that in all of the complex sentence types in which the potential focus domain can extend through the whole sentence, there is an embedding relationship among the logical structures. That is, in (6.38d–l) the linked logical structure is embedded in the matrix logical structure. If one assumes, reasonably, that each logical structure supplies the propositional content for a potential assertion, then when the linked logical structure is embedded in a higher logical structure, it contributes its propositional content to the entire representation, which may be expressed as a single speech act.<sup>7</sup> Hence the potential focus domain can extend into the entire sentence, matrix plus embedded clauses. The representations in (6.38n–s) are quite different, however: each logical structure is independent of the other, and they are linked by some kind of connective. Consequently, logical structures are not

<sup>7</sup> Direct discourse constructions in (6.38m) are not included here, because they have the unique property of allowing an independent illocutionary force operator on the embedded logical structure; hence the embedded logical structure always underlies a distinct speech act from the matrix logical structure.

part of a single complex proposition which can be expressed as a single speech act; rather, because they are independent of each other, they are potentially independent utterances. With respect to the representations in (6.38r,s), this is indeed the case; they are realized as conjoined clauses, each with its own independent illocutionary force operator. Reason, conditional and concessive clauses, on the other hand, are not linked by coordinating conjunctions but rather by subordinating conjunctions, each with their own substantial semantic content to contribute to the sentence. Because they are not daughters of the sentence node, they cannot have their own illocutionary force operator. This means that the semantic representation for these three types of ad-clausal subordinate clauses would be as in (7.78):

(7.78)  $\langle_{\text{IF}} \text{DEC} [\text{LS}_1] \text{CONNECTIVE}' [\text{LS}_2] \rangle$

Because there are two independent logical structures and only one illocutionary force operator, only one of the logical structures can be construed as asserted at a time. This is the 'Rubin effect'. Inversion is possible in the ad-clausal subordinate clause because it is possible for the potential focus domain to extend into the clause instantiating either  $\text{LS}_1$  or  $\text{LS}_2$ .

If this is the case, then why is extraction impossible out of the clause instantiating  $\text{LS}_2$ ? As stated earlier, in order for there to be extraction out of an embedded clause, the potential focus domain must extend into the whole sentence, and that is not possible in this construction. In this regard, the sentences in (7.76) are similar to conjoined constructions with respect to extraction, as (7.79) illustrates.

- (7.79) a. John cleaned the garage, and Mary washed the dishes.  
 b. \*What did John clean the garage, and Mary washed \_\_\_?

The overt marking of interrogative illocutionary force is in the first clause, while the WH-word is in fact related to the logical structure of a clause with a distinct illocutionary force operator, a clause whose form indicates declarative illocutionary force; accordingly, it is impossible to link the WH-word in the first clause to an argument position in the logical structure of the second clause. Likewise in (7.76), the interrogative marking is in the matrix clause and hence applies to the matrix clause only; the ad-clausal subordinate clause cannot be construed as interrogative, and thus the same linking problem exists as in (7.79b). Note that it is possible to have a rhetorical WH-question inside a *because*-clause.

- (7.80) It's good that Chris took on solving the problem, because who else is crazy enough to try it?

This could only be possible if the scope of the illocutionary force operator in (7.78) were over the clause instantiating  $\text{LS}_2$ .

The discussion thus far has concentrated on WH-question formation, but, as shown in (7.65), topicalization and restrictive relativization are also subject to the same constraints. In many languages these constructions are syntactically very similar, but functionally they differ in terms of the discourse function of the

Table 7.10 *Discourse functions of 'extracted' element in 'extraction' constructions*

Construction	Function of 'extracted' element
WH-question	Focus
Topicalization	Focus or Topic
Relativization	Topic

WH-word in a question, the non-WH NP in the precore slot in a topicalization construction, and the head of a relative clause. This is summarized in Table 7.10.

There is an obvious connection between WH-elements, which are always focal, and focal non-WH elements in the precore slot, on the one hand, and the potential focus domain, on the other, and this is the basis for the provisions in the linking algorithms introduced in (7.73) and (7.74). Why should topicalization and restrictive relativization also be constrained by the potential *focus* domain, given that the NP in the precore slot in a topicalization construction can be topical and that the head noun is always topical with respect to the relative clause? The essential feature that these two constructions share is that the clause in which the displaced NP functions is always *about* the referent of the NP (Kuno 1987). The central notion, then, is *pragmatic* aboutness; the restrictive relative clause must be interpretable as being about its head, and the sentence fragment following a topical element in the precore slot must likewise be interpretable as being about the precore slot element. This condition may be formulated as in (7.81); Kuno (1987) presents a similar constraint.

- (7.81) Pragmatic-aboutness condition on topicalization and relativization:  
The sentence fragment following a topical element in the precore slot or a restrictive relative clause must be pragmatically interpretable as being about the precore slot element or the head noun.

Reinhart (1981) presents an analysis of pragmatic aboutness. She argues that in order for a sentence to be about the referent of an NP, it must be possible to form an alternative sentence (with the same essential structure) in such a way that the NP at issue functions as the focus of a possible assertion that the sentence can be used to make. To illustrate what she means here, look again at (7.65a), *Those files Mulder believes Scully hid*. Reinhart's analysis requires that, in order for the sentence fragment *Mulder believes Scully hid* to be construable as pragmatically about the precore slot NP *those files*, there must be an alternative form of this sentence in which the NP *those files* serves as the focus of an assertion. The sentence in (7.64a), *Mulder believes that Scully hid the files*, is such a sentence; how can it be shown that *the files* can serve as the focus of (7.64a)? As discussed in section 6.7, only the asserted part of an utterance can be interpreted as being negated, and, accordingly, if the constituent can be negated or denied in a conversational exchange, then it is a possible focus. This is illustrated in (7.82).

- (7.82) Speaker 1: Mulder believes that Scully hid those files.  
 Speaker 2: No, the keys to his car.

The fact that this is a felicitous exchange shows that *the files* can be negated and therefore is a possible focus in (7.64a). This meets Reinhart's criterion for pragmatic aboutness, and consequently it may be concluded that the sentence fragment *Mulder believes Scully hid* is interpretable as being about the NP *those files* in (7.65a). Hence the construction in (7.65a) meets the condition in (7.81) and is predicted to be grammatical, which it is. Her criterion makes crucial reference to the constituent serving as the focus of a possible assertion that the sentence can be used to make, and here is where the potential focus domain comes in: in order for a constituent to be the focus of a possible assertion that a sentence can be used to make, it must be within potential focus domain.

Now compare (7.65a) with (7.65a''), *\*The alien spacecraft Scully interviewed the witness who saw*. In order to determine whether the sentence fragment *Scully interviewed the witness who saw* can be interpreted pragmatically as being about the NP *the alien spacecraft*, it is necessary to take an alternative form of the sentence and ascertain if *the alien spacecraft* is a possible focus in it. The alternative sentence is (7.64c), *Scully interviewed the witness who saw the alien spacecraft*; it is necessary to place it in the same type of context as in (7.82) to see if this NP can be negated.

- (7.83) a. Speaker 1: Scully interviewed the witness who saw the alien spacecraft.  
 Speaker 2: \*No, some lights in the sky.  
 b. Speaker 1: Scully interviewed the witness who saw the alien spacecraft.  
 Speaker 2: No, Skinner.(= 'Skinner interviewed the witness', = 'Scully interviewed Skinner', but not = 'the witness who saw Skinner')

The results are very different from (7.82). In both interchanges it is impossible to deny *the alien spacecraft*, and this means that it cannot be interpreted as the focus of a possible assertion that (7.64c) can be used to make. If that is the case, then the sentence fragment *Scully interviewed the witness who saw* cannot be interpreted pragmatically as being about *the alien spacecraft*, and therefore the condition in (7.81) is not met, and the topicalization construction in (7.65a'') is predicted to be ungrammatical, which it is.

In order for a constituent to be negatable (deniable) as in (7.82), i.e. without repeating the whole previous utterance, it must be interpretable as the focus of the assertion, and this requires it to be in the actual focus domain. This in turn requires that the potential focus domain extend into the clause containing the constituent. Restrictive relativization and the occurrence of topical elements in the precore slot are constrained by the condition in (7.81), which crucially builds on Reinhart's analysis of pragmatic aboutness. In her analysis, in order for a sentence fragment or relative clause to be about the referent of an NP, it must be possible to form an alternative sentence (with the same essential structure) in such a way that the constituent at issue functions as the focus of a possible

assertion that the sentence can be used to make. This requires the constituent to be in the potential focus domain. Thus, even if the displaced NP is a topic, the interpretation of the construction is still constrained by the potential focus domain. If it is focal, then the interaction with the potential focus domain is the same as for WH-questions. Thus, all of the constructions in Table 7.10 are constrained by the potential focus domain, and therefore the provisions in the linking algorithms regarding the potential focus domain will work for them, too.

There is still one puzzle remaining regarding relative clauses. While it makes sense to talk about the sentence asserting something about the topic NP in the precore slot in a construction like (7.65a), for example, it is not possible to say the same thing about (7.65b), in which *the files* is the head noun and *which Mulder believes Scully hid* is the relative clause. Restrictive relative clauses do not assert anything; as restrictive modifiers, they are presupposed. Why, then, should the potential focus domain restrict the interpretation of constructions which are by definition not asserted? A plausible answer lies in the connection between assertion and predication. Cattell (1984) and Kluender (1992) argue that the constraints being investigated are derived from restrictions on the formation of complex predication structures. This goes back to the point made earlier with respect to the logical structure of ad-clausal subordination and related peripheral subordination structures in contrast to daughter subordination. When logical structures are embedded in a higher logical structure, the resulting complex representation can be interpreted as a single complex predication underlying a single speech act. This is true of (6.38d–l), all of which roughly have the structure ‘**pred**’ (x, [. . . **pred**’ (y, [. . . **pred**’ (z, . . . ’), in which each logical structure is an argument of the logical structure in which it is embedded. This is not the case in (6.38n–s), in which the logical structures do not have this nested structure and do not form a single complex predication. The impossibility of extraction out of ad-clausal subordinate clauses would follow from the constraints that Cattell and Kluender propose.

It has long been recognized that the subject–predicate opposition is fundamentally one of topic and comment, with the predicate being an assertion about the topic (see the discussion of predicate focus in section 3.2, also Lambrecht (1994:232)). If this is the case, then limits on what can be construed as an assertion about a topic are also limits on what can be construed as a possible predication about a ‘subject’. Restrictive relative clauses are complex predications modifying an NP; note that the logical structure of a head noun + relative clause is the same as that of an attributive construction. Thus the predication relationship between *The boy* and *is tall* in *The boy is tall* is analogous to that between *the files* and *which Mulder believes that Scully hid* in (7.65b). It is uncontroversial that the predicate *is tall* asserts something about *the boy* in *The boy is tall*, and there it is clear that predication and ‘assertion about’ are fundamentally related notions. If this is the case, then the application of constraints on ‘assertion about’ to predication follows naturally. Hence, the head noun must be related to the relative clause in such a way that if the relative clause were an independent sentence and the

head noun a topic, the relative clause could be construed as an assertion about that topic. And the precondition for this is that the NP serving as the head noun must function within the relative clause in such a way that if the relative clause were an independent assertion containing the NP, the NP would be in the potential focus domain. Thus, despite the different functions of the displaced elements in these three constructions, they are all ultimately constrained by whether the potential focus domain extends into the embedded clause in question, and this follows from (7.68).

The constraint in (7.68) represents the default distribution of the potential focus domain in complex sentences. There are a number of other factors which interact with it to reduce or extend the potential focus domain. In particular, lexical semantic factors may also influence the potential focus domain, both in terms of preventing a position in the potential focus domain from being the actual focus domain and of overriding the principle in (7.68) and permitting the actual focus domain to be in structural configurations where it would otherwise be impossible. These two possibilities can be illustrated in English. The principle in (7.68) predicts that WH-question formation, etc., should be possible out of object complements, but this is not always true. It has long been noted that while it is very easy to form a question out of the complement of *say*, it is highly odd to do this out of the complements of verbs of manner of speaking, e.g. ?? *What did Fred murmur/chortle/lisp that Mary had bought?* There is a straightforward Gricean explanation for this (Grice 1975). The focus of an utterance is the most informationally rich part, and the selection of *say*, the most semantically neutral verb of saying, together with an unmarked intonation pattern, indicates that the primary information content of the utterance is the substance of the communication, which is syntactically expressed in the complement clause. Hence the focus can fall in the *that*-clause, making question formation, etc., possible. The choice of a verb which highlights the way in which something is said rather than what is said, such as *murmur*, *chortle* and *lisp*, causes the focus to shift to the verb in the main clause, because of the maxim of relevance: the speaker's choice of an informationally richer expression (*murmur*) over another, more neutral possibility (*say*) only makes sense in terms of the cooperative principle if the manner of expression is in fact highly relevant to the main point of the utterance. Hence the focus must fall on the matrix verb, keeping the complement from being the actual focus domain despite the fact that the structure as a whole meets the condition in (7.68). The same thing occurs in 'extraction' out of NPs: when the main verb is not informationally distinctive, as in *Who did you read a book about —?*, forming a question out of the PP in the undergoer NP is fine; however, when the verb is informationally rich, it naturally draws the focus for the same Gricean reason as above, precluding the possibility of the object NP being the actual focus domain, e.g. \**Who did you deface/lose/destroy a book about —?* The second type of lexical semantic effect is exemplified with complex NPs like *make the claim* or *hold the belief*. The structure of a sentence like *Fred made the claim that Mary stole the money* does not meet the condition in (7.68), because



the subordinate clause is part of an NP and is not a direct daughter of the matrix clause node; hence the potential focus domain should not extend into it, and question formation out of it should be impossible. However, it has long been known that question formation is in fact possible for at least some speakers, e.g. *What did Fred make the claim that Mary stole?*, and it has usually been argued that this question is acceptable because *make the claim that X* is virtually synonymous with *claim that X*, an expression whose structure meets the principle in (7.68). When there is no simple object complement paraphrase, as in e.g. *\*What did Fred investigate the claim that Mary stole?*, then the question is ungrammatical as predicted. In the *make the claim* examples, lexical semantic factors have overridden the principle in (7.68) to permit an otherwise excluded structure to fall within the actual focus domain.

Finally, discourse considerations may also affect the interpretation of the focus domains, as Kuno (1987) has argued. For example, the odd extraction-from-NP question above can be made rather more acceptable if it is part of an exchange like the one in (7.84), from Kuno (1987).

- (7.84) A: 'Right after Chairman Mao died, they started taking pictures of Committee members off the walls.'  
 B: 'Who did they destroy more pictures of, Chairman Mao or Jiang Qing?'

It has also been long known that these constructions are strongly affected by the definiteness of the head noun, as the examples in (7.85) show.

- (7.85) a. Who did you read a book about?  
 b. ?\*Who did you read the book about?  
 c. \*Who did you read the green book about?  
 d. \*Who did you read Pat's book about?

The only difference among these four sentences is the definiteness and the restrictive modification of the head noun; the basic syntactic structure of the four is the same. Hence whatever rules out (b)–(d) cannot be syntactic in nature. The NP headed by *book* is increasingly presupposed in (b)–(d), with concomitantly increasing difficulty of extracting out of it. Relative clauses in some languages can be affected by the definiteness and semantic content of the head noun. In Danish, for example, it is possible to form a question out of a relative clause if the main clause is relatively empty semantically and the head noun is non-specific or generic, according to Erteschik-Shir (1973) and Erteschik-Shir and Lappin (1979); they show that the Danish equivalent of *what are there many who like?* is perfectly acceptable. Jensen (2000) shows that even apparently definite restrictive relatives can permit extraction, as exemplified in (7.86).

- (7.86) Det<sub>i</sub> kender jeg den mand som har købt —<sub>i</sub>.  
 that know 1sg the man CLM has bought  
 'That I know the man who bought.'

Such a construction is acceptable only if it immediately follows an utterance introducing the referent of *det* 'that', as in (7.87).

- (7.87) Speaker 1: Jeg tror det faldeførdige funkishus er blevet solgt.  
 1sg think the tumble.down cubisthouse is been sold  
 'I think the tumble-down cubist house has been sold.'
- Speaker 2: Det<sub>i</sub> kender jeg den mand som har købt —<sub>i</sub>.  
 'That [= cubist house] I know the man who bought.'

Outside of this context (7.86) is unacceptable; hence language-specific contextual constraints serve to override the basic principle in (7.68). These facts show that restrictions on WH-question formation and related constructions cannot be treated as a purely structural phenomenon but rather must be seen as involving the interaction of syntactic structure, pragmatic functions and lexical semantics. Indeed, the fact that the same syntactic configuration may permit WH-question formation in one context or with one main verb but not allow it in a different context or with a different main verb is strong evidence that the restrictions are not purely syntactic in nature.

It seems to be the case that (7.68) is not operative in the grammar of some languages at all. Japanese appears to be such a language. Kuno (1973) and others have claimed that subjacency restrictions are not found in Japanese, because it is possible to form WH-questions, relative clauses and topicalizations out of the structures in Table 7.9. This is an oversimplification, however. As Shimojo (2002) has shown, not all WH-questions, relative clauses and topicalizations out of the structures in Table 7.9 are grammatical, and the factors that condition the acceptability of these constructions are primarily pragmatic and lexical semantic. In Japanese they seem to impose restrictions on interpretations, rather than overriding (7.68) as in English and other languages.

An important example of a structure which meets the condition in (7.68) but which is nevertheless incompatible with question formation, etc., is illustrated in (7.88).

- (7.88) a. Scully said (that) Mulder interviewed the suspect.  
 b. Who did Scully say interviewed the suspect?  
 c. \*Who did Scully say that interviewed the suspect?  
 d. Who did Scully say (that) Mulder interviewed?

The basic sentence, given in (a), meets the condition in (7.68), and, as expected, WH-question formation is possible out of it, as in (b) and (d). The embedded clause is in the potential focus domain. What is surprising is the ungrammaticality of (c); the only difference between (b) and (c) is the presence of the complementizer *that* in (c). The presence or absence of *that* has no effect on questions in which the WH-word is related to a post-verbal position; it is relevant only when the WH-word is interpreted as the 'subject' of the clause. This phenomenon is not universal, by any means. In Lakhota, for example, the presence or absence of an overt complementizer has no effect on WH-question formation in object complements (Williamson 1984; Van Valin 1993b).

The nature of this constraint concerns the distribution of narrow focus in clauses. A WH-word is narrow focus, and in a language in which WH-words occur *in situ*, the position in the clause where the WH-word occurs must be a possible position for narrow focus. In a language like English in which the WH-word occurs in the precore slot, the corresponding requirement is that the position the WH-word is interpreted as filling in the clause must be a possible position for narrow focus. In section 3.2 the distinction between marked and unmarked narrow focus was introduced, with narrow focus on the final core XP being the least marked and narrow focus on the ‘subject’ being the most marked. There is another parameter of markedness as well, namely main vs subordinate clause. All languages allow narrow focus in main clauses but some prohibit it in tensed embedded clauses, e.g. Polish (Eschenberg 1999). Hence main clauses are the unmarked location for narrow focus, embedded clauses the marked location. These two markedness parameters interact, as Table 7.11 shows. Thus, in terms of these two markedness parameters, the least marked type of narrow focus is narrow focus on the ‘object’ (i.e. final XP in the core) in the main clause, while the maximally marked type is narrow focus on the ‘subject’ in an embedded clause.

Table 7.11 *Markedness of narrow focus*

	Position of narrow focus	Location of actual focus domain
‘Object’ in main cl.	–	–
‘Subject’ in main cl.	+	–
‘Object’ in emb. cl.	–	+
‘Subject’ in emb. cl.	+	+

In (7.82) it was shown that the ‘object’ position in a *that*-clause is a possible focus position; what about core-initial position? The same test as in (7.82) can be used to find out.

- (7.89) a. Speaker 1: Scully said Mulder talked to the detective.  
 Speaker 2: No, Skinner. (= ‘Skinner said . . .’, = ‘Scully said Skinner talked . . .’, = ‘. . . Mulder talked to Skinner’)
- b. Speaker 1: Scully said that Mulder talked to the detective.  
 Speaker 2: No, Skinner. (= ‘Skinner said . . .’, = ‘. . . Mulder talked to Skinner’, but ?? = ‘Scully said that Skinner talked . . .’)

In (a), it seems relatively easy to interpret *Skinner* as replacing any of the three NPs in speaker 1’s utterance. In (b), on the other hand, while it is easy to construe *Skinner* as replacing *Scully* or *the detective* in speaker 1’s utterance, it is more difficult than in (a) to interpret it as replacing *Mulder*. This means that it is more difficult to interpret *Mulder* as the focus of speaker 1’s utterance in (b) than in (a), and this correlates with the presence or absence of *that*. It is easiest to

interpret *Mulder* as the focus in (b) if *that* is destressed and *Mulder* is stressed. This seems to parallel the fact that many native speakers find (7.88c) more acceptable if *that* is destressed and pronounced [ðət] rather than [ðæt].

It appears, then, that the occurrence of an overt complementizer blocks marked narrow focus on the preverbal privileged syntactic argument position, and if narrow focus is not possible in a position in a clause, then it is not possible to form a WH-question with the WH-word interpreted as having the function associated with that position. This is not an issue of the potential focus domain; that the potential focus domain extends into the embedded clause is shown by the grammaticality of the WH-question in (7.88d). Thus it appears that while unmarked narrow focus is possible in the embedded clause in (7.88d) when a complementizer is present, marked narrow focus on the 'subject' is not. Note that when the complementizer is absent, the 'subject' of the embedded clause occurs in effect in a position equivalent to the final position in the matrix core, a position which is the most unmarked focus position, and in this case marked narrow focus on the 'subject' of the embedded clause is indeed possible, as the grammaticality of (b) shows. This is in effect a kind of erasing of the boundary between the main and embedded clause focus structures. This account predicts that if the main clause contains a peripheral<sub>CORE</sub> adjunct, the acceptability of an embedded 'subject' question will be degraded, because the embedded 'subject' will clearly not be in the main clause unmarked focus position, and this seems to be the case, as (7.90) shows.

- (7.90) a. Who did Kim say talked to Dana?  
 b. \*Who did Kim say yesterday talked to Dana?

Thus, the sharper the distinction between main and embedded clause, the more difficult it is to get narrow focus on the embedded clause 'subject'.

If one were to try to form a topic construction with (7.88d), the result is predictably ungrammatical, \**Mulder Scully said that interviewed the suspect*. Because this sentence does not pass the negation test in (7.89b), it fails to meet Reinhart's pragmatic aboutness criterion and therefore fails to meet the condition on topic constructions in (7.81). The issues raised above in the discussion of pragmatic aboutness apply to (7.88c) as well, and the failure to meet Reinhart's criterion has the same consequences. Thus, the occurrence of an overt complementizer renders the 'subject' of the embedded clause pragmatically and syntactically inert with respect to 'extraction' constructions.

It has been shown in this section that the much discussed and theoretically very important restrictions on WH-question formation and related constructions are the result primarily of the complex interaction of syntactic structure and focus structure; they are neither purely syntactic, nor are they purely pragmatic. As is well known, languages vary with respect to the restrictions placed on question formation, and the approach presented here makes it possible to identify the parameters along which languages will vary. There are two major ones: (1) how 'deep' into the sentence does (7.68) apply?, and (2) how much can lexical semantic

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and other factors override (7.68)? As mentioned in chapter 6, some languages restrict the potential focus domain to matrix clauses only, and accordingly no extraction out of any kind of embedded clauses is possible. Moreover, lexical semantic and pragmatic factors can interact with (7.68) to lead to variation in acceptability of question formation, etc., within a single language and across languages.

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