

OPTIMIZING STRUCTURE IN CONTEXT:
SCRAMBLING AND INFORMATION STRUCTURE

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I certify that I have read this dissertation and that in my opinion it is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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Abstract

This dissertation examines the “free” word order or scrambling phenomena in German and Korean from the perspective of constraint interaction in Optimality Theory. To overcome the problems raised in single-component analyses in explaining word order variation, I propose an ‘interface’ approach in which the constraints from several different components of grammar participate, compete, and interact with one another. That is, various word orders are considered to be motivated and constrained by interactions among syntactic, semantic, and discourse principles of these languages. As the constraints from different modules of grammar are highly conflicting, I utilize Optimality Theory to demonstrate how the constraints interact and resolve conflicts among one another. In this approach, each scrambled variant, i.e. a sentence with a particular word order, is conceived of as the “optimal” output, which instantiates the syntactic, semantic, and discourse-contextual information given in the input.

I first develop the phrase structural constraints in German and Korean, referred to as CANON, which are responsible for the mapping from the argument-structure and grammatical-function information to the phrase structure configuration, which in turn reflects the surface word order. Then, I examine the semantic and discourse effects of scrambling and propose a model of information structure based on the two cross-classifying discourse features [New] and [Prom] to capture the complex interactions of topic and focus on word order. The semantic effect of specificity is also handled

in terms of information structure by means of semantic restrictions on discourse feature assignment. Based on this information structure, I propose two information structuring constraints *NEW* and *PROM*, which are the mapping constraints between information structure and phrase structure, as the major driving forces of scrambling. Finally, I demonstrate the interaction and conflict-resolution among these constraints in the German and Korean scrambling data by proposing a particular ranking for each language.

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Contents

Abstract	iv
Acknowledgments	vi
1 Introduction	1
1.1 Overview	1
1.2 Theoretical Assumptions	5
1.2.1 Optimality Theory	5
1.2.2 Lexical Functional Grammar	8
1.3 Organization	13
2 Phrase Structure and Configurationality	16
2.1 Phrase Structure in German	17
2.1.1 Verb Second and Clause Structure	18
2.1.2 S and VP	22
2.2 Canonical Order and Phrase Structural Constraints	32
2.2.1 Canonical Word Order	32
2.2.2 Phrase Structural Constraints CANON	34
2.3 Phrase Structure in Korean	49
2.3.1 Evidence for VP in Korean	51

2.3.2	Coordination and Clause Structure	56
2.4	Summary	70
3	Specificity, Focus, and Information Structure	71
3.1	Semantic and Discourse Effects of Scrambling	72
3.1.1	Specificity Effect	72
3.1.2	Anti-focus Effect	80
3.1.3	Contrastive Focus Effect	85
3.2	Information Structure	88
3.2.1	Information Packaging	89
3.2.2	Topic and Tail	92
3.2.3	Contrastive Focus and Completive Focus	96
3.2.4	Topic and Contrastive Focus	102
3.3	Scrambling and Information Structuring Constraints	107
3.3.1	Feature-Based Information Structure	108
3.3.2	Information Structuring Constraints	113
3.4	Specificity and Information Structure	118
3.4.1	Specificity Effect Revisited	118
3.4.2	Specificity and Information Status	122
3.5	Summary	129
4	Optimality Theory and Scrambling in German	131
4.1	Optimality Theory and Scrambling	132
4.1.1	Inputs and Information Structure	133
4.1.2	Outputs and Candidate Set	141
4.1.3	Constraints and Ranking	150
4.2	Deriving Semantic/Discourse Effects in Scrambling	161
4.2.1	Information Context Types	161

4.2.2	Anti-Focus Effect	171
4.2.3	Contrastive Focus Effect	175
4.2.4	Specificity Effect	178
4.3	Summary	189
5	Order and Morphology: Korean	191
5.1	Information Structuring by Morphology	192
5.1.1	<i>nun</i> : Topic or Contrastive Focus?	192
5.1.2	<i>nun</i> as a [+Prom] marker	196
5.2	Information Structuring by Order	198
5.2.1	Reading Distribution and Relative Order	198
5.2.2	Scrambling motivated by Oldness	202
5.2.3	Scrambling motivated by Prominence	204
5.2.4	Ambiguity Resolution by Further Constraints	207
5.3	Optimality-Theoretic Interaction between Morphology and Order	213
5.3.1	Constraints and Ranking	214
5.3.2	Choosing between Topic and Contrastive Focus	219
5.4	Summary	228
6	Conclusion	230
6.1	Summary and Concluding Remarks	230
6.2	Remaining Issues	235

Chapter 1

Introduction

1.1 Overview

This dissertation examines “free” word order or ‘scrambling’ phenomena in German and Korean. Word order in German or Korean is “free” in that fairly extensive alternative constituent orders are possible. Yet, it is not totally free because alternative orders are not in absolute free variation: they are also restricted and constrained so that only certain orders are possible in certain semantic and discourse contexts.

Variation is a difficult problem to deal with in a principled manner. It is especially problematic for the theories which are based on certain ‘principles’ governing a single domain or component of grammar. Variation means more than one form is possible. Under standard assumptions of grammar where principles or rules are not violable, variation often requires either ‘optional’ application of those principles or rules, or positing some abstract or invisible elements or features which would satisfy those principles in the alternative cases. Also, if only a single component or module of grammar is responsible for a certain phenomenon, it is hard to understand why variation should happen. Principles which govern one component of grammar are usually defined to yield one “grammatical” form, and thus they have a common interest and therefore

seldom conflict with each other.

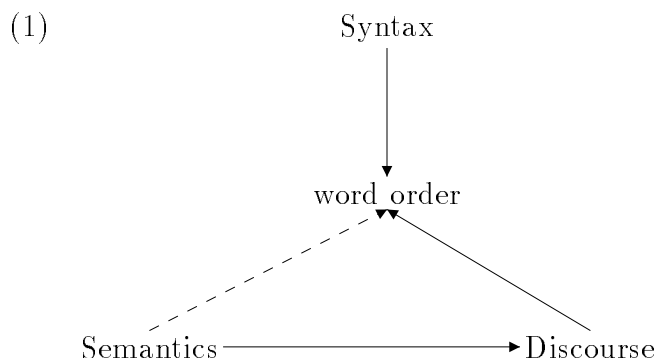
Interestingly, several different components of grammar have claimed that they are responsible for surface word order. Syntax is an obvious one. It has been argued that grammatical features such as case, agreement, and thematic roles are licensed in certain phrase structural configurations so that the surface order is determined by those features. Recently, it has been claimed that word order variation or scrambling is also driven by such grammatical features (Mahajan 1990, Miyagawa 1994, Miyagawa to appear). That is, Case or agreement motivates scrambling: a phrase is scrambled so that its Case can be licensed in a certain (Spec) position; or a phrase is scrambled so that its “strong” Agr feature can be “checked off”. Even apart from the problem that more than one “strong” Case or Agreement position should be posed because scrambling, unlike object shift (Holmberg 1986, Vikner 1990), is not limited to a single Spec position, the problem of ‘optionality’ of scrambling still remains hard to handle. It has to be said that an in-situ phrase does not scramble because: Case can optionally be licensed in the base position; the Case licensed in the base position is different from that licensed in a scrambled position, e.g. weak versus strong (de Hoop 1992); or the Case/Agr feature can optionally be either “strong” or “weak”. These claims, however, are hard to test, especially when there is no overt evidence such as morphological case or agreement distinctions.

Discourse-pragmatics is another area in which word order has long been researched. Here, it has been argued that discourse-contextual information such as given/new and familiar/novel determines the relative order among the component elements (Sgall et al. 1986, Li and Thompson 1976, Givón 1989). In most of the Praguean and functionalist analyses, given information is argued to precede new information in the sentence. Sgall et al. (1986) refer to this as Communicative Dynamism (CD). Constituents with more CD contain the newest, most prominent information and appear

after constituents with less CD, i.e. with older information. However, this is not always the case. Not all sentences are aligned this way, and not all languages allow rearrangement of the elements according to this type of information. Although this approach has an intuitive appeal, the problem is that it is not always true, at least in German and Korean word order, as we will see in this dissertation.

Recently, it has also been argued that a certain ordering variant is semantically-driven (de Hoop 1992, Diesing 1992, Diesing 1994). That is, a phrase, i.e. an indefinite phrase, is scrambled to receive a ‘specific’, ‘strong’, or ‘presuppositional’ interpretation. Diesing (1994:5) fairly strongly claims that scrambling (as well as object shift) is “an instance of semantically-driven movement, as result of interpretation conditions applying in the syntax-semantics mapping which induce movement”. As is the case with other approaches, optionality is a problem here too: a definite phrase can be in the base position regardless of its strength or presuppositionality. Moreover, a scrambled indefinite phrase does not always receive a strong/presuppositional reading (see chapter 3 for detailed discussion).

To summarize, none of the above approaches are quite right although each of them has some truth in it. I argue that the problem lies in that they try to explain the phenomena in a single domain or component of grammar. I argue instead that scrambling is due to the interplay of several different components of grammar rather than to a dominant control by any one particular module. Specifically, I argue that scrambling is motivated and constrained by the interactions of syntax and discourse, and further constrained by semantics indirectly, as illustrated in (3).



The basic idea is that each component of grammar has its own interests represented in some form of principles or constraints, and scrambling happens when the signals from different components mismatch. For example, in syntax, one of its major concerns is to realize the argument-structural or grammatical-functional information in terms of phrase structure: for instance, subject should c-command other phrases in German and Korean. On the other hand, it is one of discourse-pragmatics’s major concerns to realize discourse-functional information in terms of order: topic should precede focus. Finally, in semantics, it is an issue whether a specific or a nonspecific entity has a discourse-referent, and this indirectly influences as to what can be a topic or a focus. These principles or constraints in different components of grammar could send a conflicting signal as to how to realize all the information, and then the grammar finally decides which surface structure would be the best way to compromise all the information. In a sense, grammar divides its labor into several different components in deciding its surface word order (Reinhart 1995).

As a concrete tool to demonstrate *how* the principles from different modules of the grammar interact and resolve conflicts among one another, I utilize Optimality Theory. ‘Optimization’ seems to be the right concept to capture the idea of instantiation of the potentially conflicting information. Especially, the notion of violable constraints and the ranking of the constraints are quite crucial in the multi-component

interface approach, because if constraints were not violable, there could be no compromise and reconciliation, and if constraints were not ranked, it would be hard to know which word order is the best form possible for the given syntactic, semantic, and discourse information.

In the next section, I briefly lay out the theoretical assumptions I take throughout this thesis. I adopt a grammar of parallel, copresent representations like LFG to show the active interactions between different components of grammar involved in free word order phenomena. I first present the core ideas and basic operating mechanisms in Optimality Theory and then the organization of the grammatical structures in LFG.

1.2 Theoretical Assumptions

1.2.1 Optimality Theory

Optimality Theory (Prince and Smolensky to appear) seems to be an appropriate tool to deal with word order phenomena, which I argue are a consequence of interactions of several different types of information (formulated in the form of constraints) from different sectors of grammar, because it is designed to formally manage such potential conflicts among constraints.

In Optimality Theory, a grammar is a function mapping each linguistic input to its correct structural description or ‘parse’, or output. For example, it maps an underlying phonological string to its prosodic parse (Prince and Smolensky to appear). Inputs consist of raw materials from which the candidate outputs are built (see section 4.1 for more detailed discussion of input and output representations assumed in this thesis). In syntax, inputs are usually taken to be some skeletal structure containing predicate-argument information (Grimshaw 1993, Grimshaw in press, Legendre et al. 1993, Legendre et al. 1995b, Bresnan 1996), tense/aspect specification, and certain

semantic and pragmatic information (Grimshaw in press, Legendre et al. 1993, Legendre et al. 1995b, Grimshaw and Samek-Lodovici 1995).

For every input, GEN (for “generator”), a cross-linguistically universal function, generates the universe of possible candidate outputs or parses, i.e. the *candidate set* (e.g. roughly a combination of S-structure and LF in GB (Legendre et al. 1995b, Pesetsky 1993), or a combination of f(unctional)-structure and c(onstituent)-structure in LFG (Bresnan 1996)).

Universal Grammar also provides a set of ‘well-formedness’ constraints on outputs. Interestingly, unlike ‘principles’ of more familiar type in the previous theories, the constraints in OT are *violable* and actually many possible outputs violate one or more constraints. These constraints are, in general, highly *conflicting*. OT provides an explicit way to determine how these highly conflicting and also violable constraints interact with each other and resolve the conflicts: constraints are *ranked*. According to Optimality Theory, the grammar of a particular language ranks the universal constraints in a language-particular dominance hierarchy: the grammar declares that one constraint is more important than another, and thus satisfying the former is more important than satisfying the other. As such, Optimality Theory provides a general means for constructing particular grammars from universal constraints.

The “grammatical” forms or the ‘optimal’ outputs among the candidates are selected according to how well they satisfy the well-formedness constraints. This process of selecting the optimal outputs is called EVAL. These forms are not forced to exhaustively satisfy the entire constraint set. In other words, failure to satisfy a constraint does not necessarily result in ungrammaticality. Rather, a grammatical output is the one that satisfies the constraints as best as it can, or *optimally*. Given the ranking of the constraints, the optimal output is the form which, for every pairwise competition involving it, best satisfies the highest-ranking constraint on which the competitors conflict (Grimshaw in press). This optimal output is the correct or grammatical

parse of the given input.

Suppose that we have a candidate set of A, B, and C, and a universal set of constraints C_1 , C_2 , and C_3 . Suppose that the particular language L under consideration has the following grammar. The dominance hierarchy is represented by \gg : $C_1 \gg C_2$ states that C_1 is ranked higher than C_2 .

(2) Grammar(L):

$$C_1 \gg C_2 \gg C_3$$

Now let's assume that the candidates violate the constraints in the following pattern:

(3)

	CANDIDATES	C_1	C_2	C_3
	A	*		
☺	B			*
	C		*	*

The constraints in the tableau are lined up from left to right according to their ranking: the left-most constraint is the highest. When a candidate violates a constraint C, then it incurs a * mark to the constraint. Evaluation begins with the highest constraint. The competing candidates A, B, and C are evaluated against the highest constraint C_1 , and candidate A fails to satisfy it in (3). Although it does not violate any of the remaining lower-ranked constraints, it is dropped out of competition because it violates the highest constraint. Candidate B and candidate C enter the next competition. Now, candidate C violates the next highest constraint C_2 , and thus it loses to candidate B. Notice that candidate B also violates a constraint, i.e. C_3 . However, it is still the 'optimal' output (which is represented as a smiling face (☺) in this thesis) because it best satisfies the highest-ranking constraint on which the competitors conflict.

The core ideas in Optimality Theory, i.e. constraints are violable and ranked, and optimal outputs do not necessarily satisfy all the constraints in the grammar, provide an insightful solution to the variation problem in word order. Any candidate can in principle be an optimal output as long as it does not violate a higher constraint. Depending on the input, the constraint violation will vary, and thus EVAL can yield a different output. The information in the input for word order can vary because it contains discourse-contextual information as well as grammatical information. Therefore, each alternative order can be thought of as the optimal realization of the given information in the input.

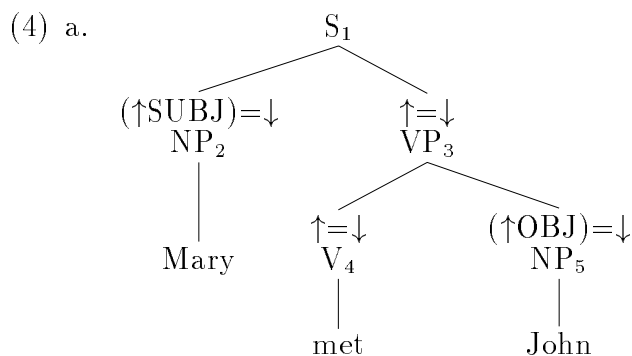
1.2.2 Lexical Functional Grammar

This section outlines the basic theoretical assumptions of LFG, a unification-based theory without movement (Bresnan and Kaplan 1982, Bresnan 1982, Sells 1985, Bresnan 1995a). The grammatical representation in LFG consists of several different parallel structures: no structure is derived from another structure and the relationship between structures is defined by a mapping function. Especially, LFG separates information about grammatical functions from that about the phrase structure, and grammatical functions are not necessarily defined via phrase structure positions. Structural relationships are represented as c(onstituent)-structure, while grammatical functions are represented at f(unctional)-structure.

The surface word order is encoded by c(onstituent)-structure. C-structures represent the surface precedence and dominance relations in a language. The X' -theory in LFG accommodates cross-linguistic typological variation. It not only generates regular projecting categories (e.g. V, V', VP) including functional categories such as IP and CP (King 1993, Kroeger 1993, Bresnan and Mchombo 1995, Bresnan 1995a), but also produces a category such as S, which has no fixed categorial head (exocentric) and projects no higher category. This category S can dominate either a configurational or

non-configurational (“flat”) structure. In the latter case, grammatical functions are not determined by the phrase structural configuration, but by the case and agreement morphology (Bresnan 1995a). Notably, elements in c-structure are all base-generated: there is no movement. The effects of movement are handled by the fact that different c-structure positions may correspond to the same f-structure by general principles (‘unification’).

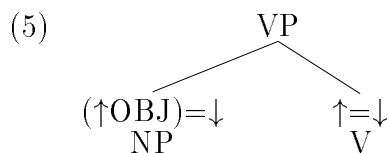
Unlike c-structure which encodes dominance and precedence relations, f(functional)-structures encode grammatical function and other information relevant to the syntax. Also unlike c-structures, f-structures are composed of attribute-value matrices. Attributes can be such entities as grammatical functions (SUBJ, OBJ, COMP), tense (TENSE), and nominal features (CASE, NUM, GND). Each attribute must be assigned an appropriate value. Values are supplied by the lexical entries of the items and by functional annotations on the c-structure. F-structures can appear within other f-structures as the value of one of the outer f-structure’s attributes. For example, the f-structure of a sentence containing a complement clause has an attribute COMP whose value is an f-structure corresponding to the complement clause. Consider the simple example of c-structure and f-structure representations in (4).

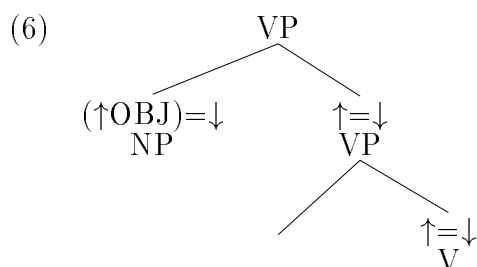


$$\text{b. } \left[\begin{array}{ll} \text{PRED} & \text{'meet(x,y)'} \\ \text{SUBJ} & \left[\text{"Mary"} \right]_{x,2} \\ \text{OBJ} & \left[\text{"John"} \right]_{y,5} \\ \text{TENSE} & \text{'Past'} \end{array} \right]_{1,3,4}$$

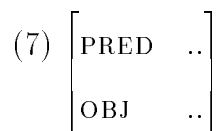
The annotations under the phrase structure nodes state how this information maps onto information in the f-structure. The \downarrow indicates the information corresponding to that node, while the \uparrow indicates the f-structure corresponding to the mother node. The annotation $(\uparrow\text{SUBJ})=\downarrow$ above the NP states that the NP therein is the subject of the f-structure corresponding to its mother, i.e. of the f-structure corresponding to S (numbered as 1). Likewise with $(\uparrow\text{OBJ})=\downarrow$. The annotation $\uparrow=\downarrow$ above the VP and the V states that the VP and also the V is the head of its f-structure, which is identical to that of S ($1=3=4$). F-structures are constrained by general principles such as **COMPLETENESS** and **COHERENCE**, which roughly require that every function has its predicate and a predicate has all its functions.

Consider now how a scrambled structure is represented in the c-structure and f-structure. I assume that scrambling has an adjunction structure since it is not limited to a single position and multiple scrambling is also possible (Lee 1993). Compare the c-structure for the object in the canonical position in (5) and that for the object which is adjoined to VP in (6).

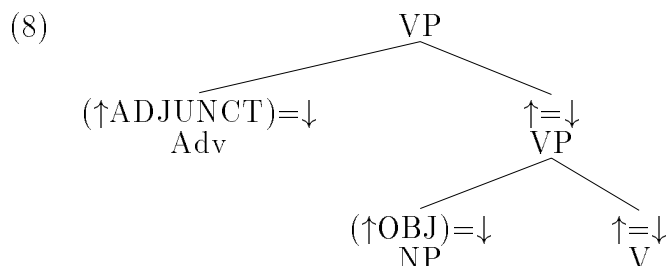




As mentioned above, every element is base-generated in this framework. Therefore, the adjoined object is also base-generated there as shown in (6): there are no movement and no traces. The functional annotation above the NP indicates that it is the f-structure OBJ just as that in (5) is. In this case, some other principles in the language such as case principles, not the phrase structural configuration, determine the functional annotation. In other words, although (5) and (6) differ in the c-structure, they have the same f-structure, as in (7).



If an object can be base-generated in an adjoined position, how would it be distinguished from an adverb, for example, which may also be base-generated in such a position? An adverb will be annotated differently from an object: it carries the ADJUNCT function, as shown in (8).



As defined in Bresnan (1995a), ADJUNCT is distinguished from SUBJ or OBJ in that only the latter are *argument* functions. Thus, I define ‘scrambling’ as follows:

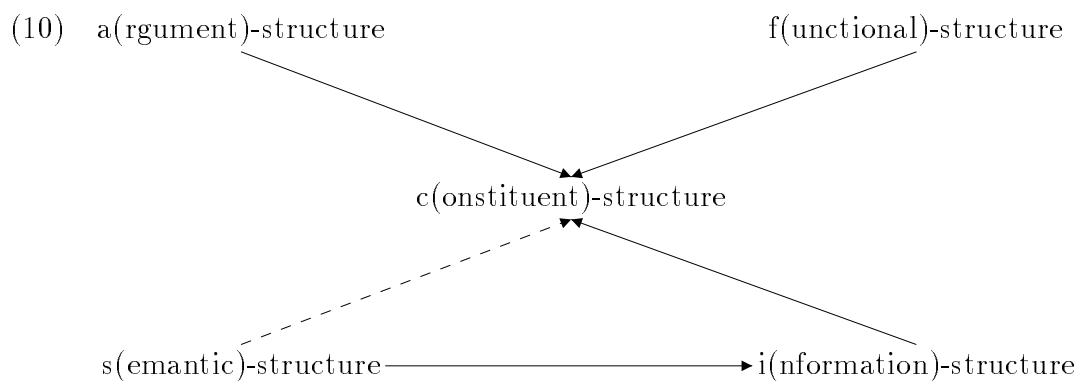
- (9) Scrambling is an adjunction to a maximal projection of a phrase which carries an argument grammatical function.

In addition to c-structure and f-structure, there are other modules of grammar such as a(rgument)-structure (Alsina 1993) and s(emantic)-structure (Halvorsen 1983, Halvorsen and Kaplan 1988, Dalrymple et al. 1993). Argument-structure represents information about predicate-argument relations. Although research has been focused on the mapping between the a-structure and f-structure (e.g. Lexical Mapping Theory (LMT), see Alsina and Mchombo (1994), Bresnan and Kanerva (1989), and Bresnan and Moshi (1990)), there is no reason, in principle, that this structure should not interact directly with c-structure. Actually, I argue in chapter 2 that word order, which is represented at the c-structure, is influenced by the information about the thematic roles as well as by the information about the grammatical functions. In other words, there is an active interaction between the a-structure and the c-structure in addition to one between the f-structure and the c-structure. The properties of the s(emantic)-structure are beginning to be explored, but it can be assumed that basic semantic information is represented there.

In addition to the already-existing structures introduced above, I propose another structure in this dissertation: i(nformation)-structure. This structure contains discourse-contextual information of each element, represented by the crossclassifying features [New] and [Prom] (see chapter 3 for motivation of these features). Just as any other structures of grammar, the i-structure also interacts with other structures as an independent module and the information flow between the structures will be defined by a relevant mapping mechanism.

As discussed in section 1.1, word order variation cannot be easily explained by a single domain or component of grammar, but should rather be captured by interactions of several different modules of grammar. LFG fits well for this purpose because it consists of parallel, copresent structures. Moreover, as Bresnan (1996) shows in her

OT analysis of the head movement phenomena in English, the mapping principles between any two structures of grammar, e.g. c-structure and f-structure, and a-structure and f-structure, can be easily converted to the OT constraints. Since no structure is derived from another structure, it is natural that all these mapping constraints between modules compete and interact simultaneously. This simultaneous constraint competition between different modules of grammar is what I argue happens in the word order variation phenomena in German and Korean. Therefore, I propose the following as the inter-structure interactions involved in the scrambling phenomena.



1.3 Organization

This dissertation is organized as follows.

Chapter 2 examines basic phrase structures in German and Korean. Although German and Korean are well-known ‘scrambling’ or “free” word-order languages, a certain sentential structure or string order of constituents is considered to be ‘unmarked’, or ‘canonical’. The purpose of this chapter is to investigate what the unmarked canonical phrase structural descriptions in German and Korean are, and how they can be achieved in terms of a set of phrase structural constraints in the spirit of Optimality Theory.

In chapter 3, I investigate the “free” ordering or scrambling phenomena. I show

that each alternative structure denotes a slightly different interpretation, and classify these meaning-related effects into two distinct categories, semantic (specificity effect) and discourse (anti-focus effect), and point out that these two effects are not unrelated, which is demonstrated in the contrastive focus effect. Taking the interpretational differences as a clue to the ordering variation in these languages, I develop two information structuring constraints within the feature-based model of information structure. Finally, I argue that the specificity effect can also be subsumed under the general information-based approach.

In chapter 4, utilizing the core ideas in Optimality Theory (Prince and Smolensky to appear, Grimshaw 1993, Grimshaw in press), I show how varying scrambled structures are derived by the interactions among the constraints developed in the previous chapters. Here, each alternative sentential structure of a sentence is viewed as the ‘optimal’ output which encodes the syntactic (e.g. argument-structure, grammatical-functional structure) and also discourse-pragmatic (e.g. information structure) information provided in the input in the best possible way by means of phrase structure and/or prosodic structure. It is shown that, while searching for the optimal output in each context, the semantic and discourse effects (i.e. the specificity, anti-focus, and contrastive-focus effects) often associated with scrambling, naturally follow from the constraint competition from different modules of grammar.

Chapter 5 examines scrambling phenomena in Korean also from the perspective of information structuring. It is argued that scrambling in Korean is also motivated and constrained by the interaction of the information structuring constraints and the phrase structural constraints. Special attention is paid to the difference in information encoding between the scrambling of the regularly case-marked phrases and that of the phrases marked with the so-called topic marker *nun*. It will be shown that the difference results from the interaction between constituent order and morphological marking.

Finally, chapter 6 summarizes the major arguments of this dissertation and briefly discusses several remaining issues for future research.

Chapter 2

Phrase Structure and Configurationality

This chapter examines basic phrase structures in German and Korean. As is well known, German and Korean are ‘scrambling’ or “free” word-order languages, which allow more than one phrase structural description per sentence and thus have various ordering possibilities of the constituents. Even in these scrambling languages, however, a certain sentential structure or string order of constituents is considered to be ‘unmarked’, ‘default’, ‘neutral’, or ‘canonical’. The purpose of this chapter is to investigate what the unmarked, canonical phrase structures are in German and Korean, and how they can be achieved in terms of a set of phrase structural constraints in the spirit of Optimality Theory.

The “free” word order property of these languages has often given rise to the ‘configurationality’ controversy as it is one of the major ‘nonconfigurational’ properties described by Hale (1982, 1983). However, I argue in this chapter that both German and Korean have configurational structures in the sense that they have a VP projection which structurally distinguishes subject from non-subject arguments: only the latter are generated within VP. Accordingly, the “free” word order is characterized

not by alternative “flat” phrase structures, but by alternative adjoining structures where scrambled elements are adjoined to higher maximal projections.

I propose that German and Korean have the same phrase structural configurations for their basic clause structure, i.e. S (see the discussion in section 2.1.2). Yet, they differ in that German has a CP projection, which evokes the V2 effect in matrix clauses, while Korean does not have any functional projections above the simple clause structure S. Thus, Korean is uniformly S in both matrix and embedded clauses.

The organization of this chapter is as follows. In section 2.1, I briefly discuss German phrase structures, focusing on topicalization phenomena including VP-fronting. Based on the German facts in section 2.1 (which will also apply to Korean), I propose a set of phrase structural constraints in section 2.2 which will be responsible for the ‘default’ or ‘canonical’ phrase structural descriptions. Then, in section 2.3, I provide detailed discussion of the phrase structural configuration in Korean, particularly of the lack of functional categories in this language.

2.1 Phrase Structure in German

I assume with den Besten (1981, 1983), Webelhuth (1985), and Vikner (1990, 1995), among others, that German has a configurational phrase structure despite the fact that it entertains fairly free word order possibilities. I argue that German has a VP projection which includes all the internal arguments but excludes the external-argument subject. This is in contrast to the claims by Haider (1981) and others that German should be described as having a nonconfigurational base component. The main argument for a VP projection comes from the fact that German demonstrates a typical behavior of verb phrase languages: a verb and its objects are often involved in syntactic operations, but not a verb and its subject. I will primarily discuss ‘topicalization’ (or fronting) as a constituency test for German.

2.1.1 Verb Second and Clause Structure

Although most elements in German can freely switch positions with one another, especially in the ‘Middle Field’ (which is roughly the area between the finite verb and (if any) the non-finite verb(s) at the end of a matrix clause), one position is strictly fixed for a particular element of the sentence, that of the finite verb. Namely, the finite verb must be placed in the second position in matrix (declarative) clauses, i.e. right after the first constituent of the sentence.¹ This phenomenon is usually called ‘Verb Second’. The first constituent, immediately before the finite verb, can be practically anything: it may be a subject, an object, an adverbial, or even a non-finite verb or a verb phrase, as illustrated in (2).

- (1) Der Kurier sollte nachher dem Spion den Brief zustecken.
 the courier(Nom) should later the spy(Dat) the note(Acc) slip
 ‘The courier was supposed to slip the spy the note later.’

- (2) a. DER KURIER **sollte** nachher dem Spion den Brief zustecken.
 b. NACHHER **sollte** der Kurier dem Spion den Brief zustecken.
 c. DEM SPION **sollte** der Kurier nachher den Brief zustecken.
 d. DEN BRIEF **sollte** der Kurier nachher dem Spion zustecken.
 e. ZUSTECKEN **sollte** der Kurier nachher dem Spion den Brief.

Although the subject-initial clause in (2a) is conceived of as being in the default or unmarked order, any of the other elements can be ‘topicalized’, i.e., can appear in the initial position. What is remarkable here is that no matter what kind of phrase or word is in the initial position, in the second position is the finite verb, e.g. *sollte* ‘should’ in (2). The invariability of the verb second position becomes more notable

¹Interrogative and imperative sentences may have the finite verb in the first position.

when it is compared with the flexibility of order among the elements after the finite verb (except for the nonfinite verb in the final position). Examples with the adverb *nachher* ‘later’ in the initial position are illustrated in (3).

- (3) a. Nachher **sollte** der Kurier dem Spion den Brief zustecken.
 b. Nachher **sollte** der Kurier den Brief dem Spion zustecken.
 c. Nachher **sollte** den Brief der Kurier dem Spion zustecken.
 d. Nachher **sollte** dem Spion der Kurier den Brief zustecken.
 e. Nachher **sollte** dem Spion den Brief der Kurier zustecken.
 f. Nachher **sollte** den Brief dem Spion der Kurier zustecken.

All possible permutations arise of the three arguments, i.e. *der Kurier* ‘the courier’, *dem Spion* ‘the spy’, and *den Brief* ‘the note’, in (3). Therefore, the word order in matrix clauses can be generalized as follows: the first position is filled by any constituent (except for the finite verb), then the second position is filled by the finite verb, and the remaining part of the sentence contains the non-verbal elements in free order.

In sharp contrast with matrix clauses, embedded clauses do not show any V2 effect. The finite verb, in fact, should not be positioned in the second position as shown in (4a). Instead, it must be in the sentence-final position as shown in (4b).

- (4) a. *Ich glaube, daß der Kurier **sollte** nachher dem Spion den Brief zustecken.
 I believe that the courier should later the spy the note slip
 ‘I believe that the courier was supposed to slip the spy the note.’
 b. Ich glaube, daß der Kurier nachher dem Spion den Brief zustecken **sollte**.
 I believe that the courier later the spy the note slip should
 ‘I believe that the courier was supposed to slip the spy the note.’

This matrix/embedded asymmetry as to the finite verb's position makes it almost a consensus among researchers on German phrase structure that the finite verb and the embedding complementizer, e.g. *daß* 'that', are in complementary distribution because they compete for a single position, i.e. C, the head of the C(omplementizer)P(hrase) (Holmberg 1986, Platzack 1986, Vikner 1990, Vikner 1995). That is, since the C position is filled with a complementizer in embedded clauses, the finite verb cannot be located there, thus there is no V2. On the other hand, in matrix clauses, which are not headed by a complementizer, the finite verb can be positioned in C. In other words, the matrix clause in German is viewed as a CP projection just as the embedded clause is. The fact that only one constituent is possible before the finite verb in matrix clauses can also be explained by the CP analysis, i.e. by the fact that there is only one Spec position available before C, i.e. [Spec,CP].

The complementary distribution between a complementizer and a finite verb is further supported by the following data. First, consider the example in (5).

(5) Ich glaube, der Kurier **sollte** nachher dem Spion den Brief zustecken.

I believe the courier should later the spy the note slip

'I believe the courier was supposed to slip the spy the note.'

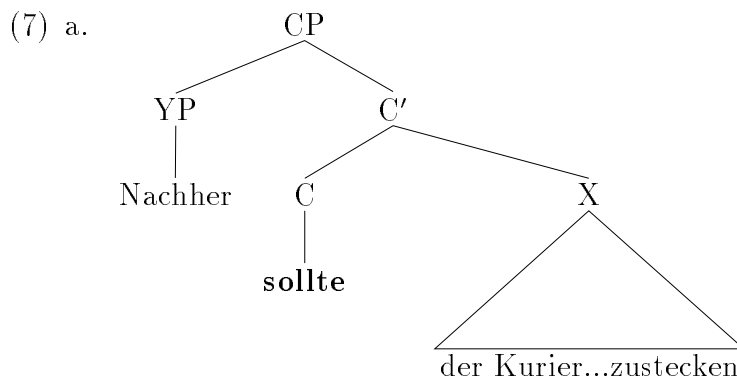
If the complementizer *daß* 'that' is missing, V2 arises even in an embedded clause, as demonstrated in (5). This too can be predicated if we assume that the finite verb is generated in C whenever possible. That is, if C is not filled by a complementizer, the position is available for the finite verb. Since C is now occupied by a finite verb, the Spec position is also available and is filled by the subject in this case.²

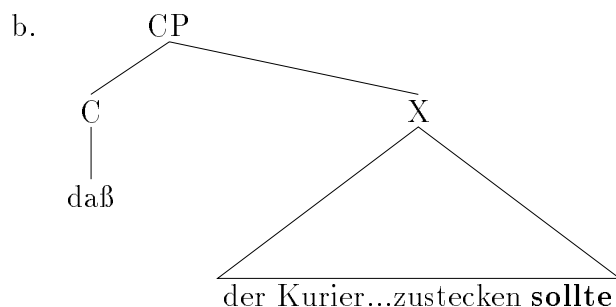
²When C is filled by a complementizer, the Spec position cannot be filled by anything in German. This is unlike the situation in Swedish, for example, whose complementizer *som* 'that' allows a *wh*-phrase to be generated in the Spec. This seems to be due to an intrinsic property of the complementizer in German which prevents its Spec from being filled.

In addition, the CP analysis is also supported by the fact that the order among the elements after the complementizer (in C) in embedded clauses is just as free as it is in matrix clauses after the finite verb (also in C). Compare the examples in (6) with those in (3).

- (6) a. **daß** der Kurier dem Spion den Brief zustecken sollte.
- b. **daß** der Kurier den Brief dem Spion zustecken sollte.
- c. **daß** den Brief der Kurier dem Spion zustecken sollte.
- d. **daß** dem Spion der Kurier den Brief zustecken sollte.
- e. **daß** dem Spion den Brief der Kurier zustecken sollte.
- f. **daß** den Brief dem Spion der Kurier zustecken sollte.

Hence, by positing CP for both matrix and embedded clauses, the Verb Second effect in matrix clauses and also its absence in embedded clauses is neatly captured. This gives us the following phrase structural description for matrix and embedded clauses in German, leaving the structural sister of C undetermined for now. (7a) is the structure for a matrix clause and (7b) for an embedded clause.





As described above, the head of CP is filled with the finite verb *sollte* ‘should’ in (7a) while it is filled with the complementizer *daß* ‘that’ in (7b). Also, the ‘topicalized’ element takes the [Spec,CP] position in the matrix clause.³ Finally, the elements in X (the heretofore undetermined category) are fairly free in order both in the matrix and embedded clauses as we have seen above: any order is permissible provided that the verb is in the final position. Nevertheless, I will argue that this category is also hierarchically structured. I will examine the internal structure of this category in the next section.

2.1.2 S and VP

Evidence adduced in the literature in favor of a hierarchical phrase structure in German and also in Korean, unfortunately, is not always free of theory-internal reasonings. For example, binding theories based on the c-command relationship frequently assume that the success of a binding relation automatically entails that the binder is in a structurally higher position than the bindee, and hence these theories generate higher functional projections as demanded by the relevant binding data. Case and agreement theories recently introduced in the Minimalist Program (Chomsky 1993), being based on the notion of syntactic checking of morphological features, generate

³I do not generate [Spec,CP] in embedded clauses for the reason mentioned in the previous footnote.

a number of functional categories such as AgrSP, AgrOP, TP, etc., even for morphologically covert case or agreement features. However, such evidence is often irrelevant in theories like LFG and HPSG, in which binding facts or case/agreement marking are not necessarily explained by phrase structural configurations. Therefore, in this section, I will rely mainly on classic constituency tests such as fronting to examine the internal structure of the basic clause.

In addition, it should be noted that in the current framework, alternative positioning possibilities of a phrase do not require generation of additional projections because scrambling is taken to be the adjunction of a phrase to a maximal projection, rather than to its placement in Spec of a functional projection, e.g. in [Spec, AgrOP] (Mahajan 1990, Jonas and Bobaljik 1993, Miyagawa to appear).

Non-Endocentric Category S

Since Pollock (1989) and Chomsky (1991), it is often assumed that basic clause structure is (presumably universally) highly articulated with functional projections such as AgrSP, TP, and AgrOP. Due to the lack of any theory-neutral evidence, phrase structural or morphological, I do not assume any functional projections other than CP for German (nor for Korean, as will be argued in section 2.3). I argue instead that the basic clause structure embedded under C in German is a simple S, i.e. an exocentric internal-subject category (Kroeger 1993, King 1993, Bresnan 1995a, 1996).

Some Germanic languages such as Icelandic and Yiddish actually show overt syntactic evidence for another verbal projection other than VP and CP. As we will see below, in these languages, a finite verb can be placed in an intermediate position between the head of CP and the head of VP, which is often regarded as evidence for IP or AgrP (Rögvaldsson and Thráinsson 1990, Diesing 1990, Reinholtz 1991, Vikner 1995). Consider the examples in (8) and (9), from Icelandic and Yiddish respectively (Vikner 1995:139).

- (8) a. *af hverju Helgi [_{VP} oft **hefði** lesið þessa bók]
 why Helgi often had read this book
 ‘why Helgi had often read this book’
- b. af hverju Helgi **hefði** [_{VP} oft lesið þessa bók]
 why Helgi had often read this book
 ‘why Helgi had often read this book’
- (9) a. *ven Avrom [_{VP} deriber **hot** geleyent dos dozike bukh]
 when Avrom therefore has read this book
 ‘when Avrom has therefore read this book’
- b. ven Avrom **hot** [_{VP} deriber geleyent dos dozike bukh]
 when Avrom has therefore read this book
 ‘when Avrom has therefore read this book’

The finite verb *hefði* ‘had’ in the Icelandic example (8b) is in the intermediate position, following the subject *Helgi* and preceding the adverb *oft* ‘often’, which marks the VP boundary. It is certainly not in C because C (or [Spec,CP]) is occupied by the *wh*-phrase *af hverju* ‘why’. This shows that the finite verb is in a position above VP but below CP, e.g. in I. The Yiddish examples in (9) demonstrate the same point.

However, German does not show any such overt syntactic evidence in favor of the existence of IP. As noted in the previous section, the finite verb in German is located in the sentence-final position in embedded clauses unless it, on rare occasions, fills the C position in the absence of an overt complementizer.

- (10) a. *Ich glaube, daß der Kurier **sollte** nachher dem Spion den Brief zustecken.
 I believe that the courier should later the spy the note slip
 ‘I believe that the courier was supposed to slip the spy the note.’

b. Ich glaube, daß der Kurier nachher dem Spion den Brief zustecken **sollte**.

I believe that the courier later the spy the note slip should

‘I believe that the courier was supposed to slip the spy the note.’

One could argue that IP in German is head-final just like VP, hence the finite verb *sollte* in (10b) is in fact in I, not in V, but we cannot see it overtly (Vikner 1995). Although this is a plausible hypothesis, positing another projection is against the general ‘economy’ principle of phrase structure generation (see Haider (1995) and references therein for similar ideas), and is unnecessary to explain the data in the present framework. Also, not assuming a theory of syntactic case/agreement feature checking, the mere presence of “rich” verbal inflections, e.g. tense and agreement, does not necessarily lead to the generation of TP or AgrPs. Therefore, I assume that German has S generated under CP and does not have intermediate functional projections.

Following Kroeger (1993), King (1993), and Bresnan (1995a, 1996), I define S as a universally available exocentric category having no fixed categorial head and projecting no higher category. Namely, there is no category X such that $S=X^{max}$, and there is no S' . S may dominate either configurational or non-configurational (flat) structures. The configurational version of S, which consists of a subject and an XP predicate, e.g. a VP, can be conceived of as being parallel, in spirit, to the internal-subject categories such as S(mall)C(lause) in Chung and McCloskey (1987) and McCloskey (1991), V^{max} in Koopman and Sportiche (1991), or VP* in Yoon (1993), in that it contains a separate maximal predicate projection, e.g. VP. These proposals are distinguished from other internal-subject hypotheses which assume that the subject is generated within VP in [Spec,VP] as a sister to V' (Kitagawa 1986, Kuroda 1988, Speas 1986, Guilfoyle et al. 1992). In the latter, it is hard to explain why the non-maximal intermediate projection, i.e. V' , behaves like a maximal projection

in various syntactic phenomena including topicalization.

In what follows, I will argue that German has a configurational S. That is, S is further structured into smaller constituents, which captures the subject/object asymmetries in this language. Crucially, whether there is a separate (maximal) projection, e.g. VP, which includes a verb and its object(s) but excludes the subject, will be tested.

Topicalization and VP

One common test for constituency is fronting. This test is based on the claim that fronting or movement only affects constituents. The main evidence in favor of the subject/object asymmetry in German also comes from a fronting phenomenon, i.e. topicalization. As we have seen in the previous section, any constituent can be ‘topicalized’ or preposed to the initial position. Since the initial position is a Spec, i.e. [Spec,CP], it allows only one constituent. For example, in (11a), the subject *der Junge* ‘the boy’ is topicalized, and in (11b), the object *dem Mann* ‘the man’ is topicalized.

- (11) a. Der Junge hat dem Mann geholfen.
 the boy(Nom) hat the man(Dat) helped
 ‘The boy helped the man’
- b. Dem Mann hat der Junge geholfen.
 the man(Dat) hat the boy(Nom) helped
 ‘The boy helped the man’

If any constituent can topicalize in German, and if there exists a constituent which is smaller than S but bigger than each individual argument phrase, a VP, for instance, then this constituent should be able to topicalize too. This is indeed the case. Consider the examples in (12).

- (12) a. [Dem Mann geholfen] hat der Junge.
 the man(Dat) help has the boy(Nom)
 ‘The boy helped the man.’
- b. *[Der Junge geholfen] hat dem Mann.
 the boy(Nom) help has the man(Dat)
 ‘The boy helped the man.’

Not surprisingly, the nonfinite verb *gehoffen* ‘help’ can be topicalized together with the object *dem Mann* as shown in (12a). In contrast, however, the nonfinite verb may not take its subject along, as illustrated in (12b) (Thiersch 1982, Webelhuth 1985). These facts suggest that German has a structural asymmetry between the subject and the objects such that the verb and its objects (or internal arguments) compose a constituent, i.e. a VP, but the verb and its subject do not.⁴

As a matter of fact, not only the whole VP but also part of it can be topicalized in German, which is often referred to as ‘remnant VP topicalization’. This is

⁴In fact, there are a couple of constructions which allow the topicalization of the verb and its subject (Webelhuth 1985, Uszkoreit 1987). These include passive and unaccusative constructions, in which the subject is more a type of internal argument, i.e. the theme/patient type of argument. Some examples are shown in (i) (Webelhuth 1985:210).

- (i) a. [Zwei Männer erschossen] wurden während des Wochenendes.
 two men(Nom) shot were during the weekend
 ‘Two men were shot during the weekend.’
- b. [Ein Unfall passiert] ist hier schon lange nicht mehr.
 an accident(Nom) happened has here for long not more
 ‘No accident has happened here for a long time.’

Interestingly, Webelhuth (1985:207) argues that German does not have NP-movement, which means that unlike in English, the theme/patient argument remains in situ, i.e. within the VP, in passive and unaccusative constructions. That is, the grammatical function change in these constructions is not derived by ‘movement’ or by a different phrase structure, but by a different case marking pattern.

This claim is supported by the fact that the direct object position in an active sentence is also the default position for the subject of the passive counterpart, as shown in (ii).

demonstrated in (13) (Webelhuth and den Besten 1987, Uszkoreit 1987, Pollard 1990).

- (13) a. [Den Brief zustecken] sollte der Kurier nachher dem Spion.
 the note(Acc) slip should the courier(Nom) later the spy(Dat)
- b. [Dem Spion zustecken] sollte der Kurier nachher den Brief.
 the spy(Dat) slip should the courier(Nom) later the note(Acc)
- c. [Nachher dem Spion zustecken] sollte der Kurier den Brief.
 later the spy(Dat) slip should the courier(Nom) the note(Acc)

This partial VP topicalization might cast doubt on the validity of topicalization as a constituency test. Yet, even in partial VP topicalization, the subject may not be included in the topicalized domain, as shown in (14) (Uszkoreit 1987:415).

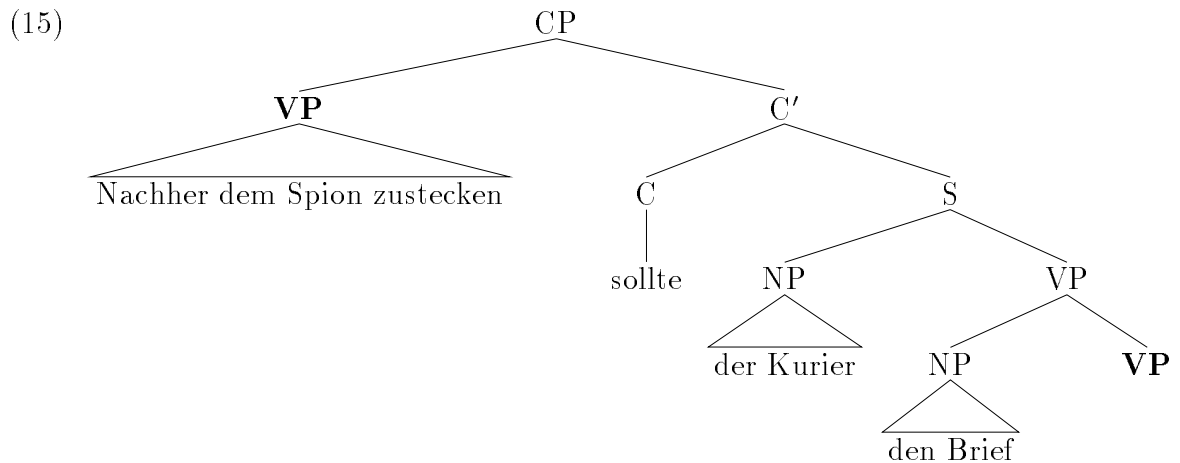
- (14) a. ??[Der Kurier zustecken] sollte den Brief nachher dem Spion.
 the courier(Nom) slip should the note(Acc) later the spy(Dat)
- b. ??[Der Kurier den Brief zustecken] sollte nachher dem Spion.
 the courier(Nom) the note(Acc) slip should later the spy(Dat)

Following Webelhuth and den Besten (1987), I assume that the remnant VP topicalization is in fact topicalization of the maximal projection VP, not of V' or V. The partiality results from the fact that some members of VP can scramble out of it and

(ii)
 weil dem Mann **ein Buch** geschenkt wurde
 because the man(Dat) a book(Nom) given was
 'because a book was given to the man'

Therefore, the apparent counterexamples in (i) can be accounted for by still treating the topicalized phrase as a VP. This may suggest that the VP in German is actually a boundary distinguishing an agent argument from non-agent arguments rather than a subject from non-subject arguments. (See the distinction of 'external' and 'internal' arguments in Williams (1980). See also Bresnan and Zaenen (1990) for an illustration of how such a distinction can be derived from the thematic role-function linking.) For the purposes of the current discussion, though, I will continue to assume that the VP distinguishes the subject from non-subjects.

that only the remaining part is topicalized. That is, the topicalized partial VP is the result of the removal of the scrambled phrases from the whole VP. For example, the sentence (13c) can be illustrated as in (15), where the direct object *den Brief* ‘the note’ is scrambled out and adjoined to VP.



This claim that remnant VP topicalization is a result of scrambling is further supported by the ungrammaticality of the examples in (16) (Uszkoreit 1987:415).

- (16) a. ??[Den Brief nachher] sollte der Kurier dem Spion zustecken.
 the note(Acc) later should the courier(Nom) a spy(Dat) slip
- b. ??[Den Brief dem Spion] sollte der Kurier nachher zustecken.
 the note(Acc) the spy(Dat) should the courier(Nom) later slip
- c. ??[Nachher dem Spion] sollte der Kurier den Brief zustecken.
 later the spy(Dat) should the courier(Nom) the note(Acc) slip

The examples in (16) show that without the accompanying verb, no combination of the remaining elements can be fronted even if they all belong to the VP. This is expected if we assume that partial VP topicalization is the topicalization of the VP

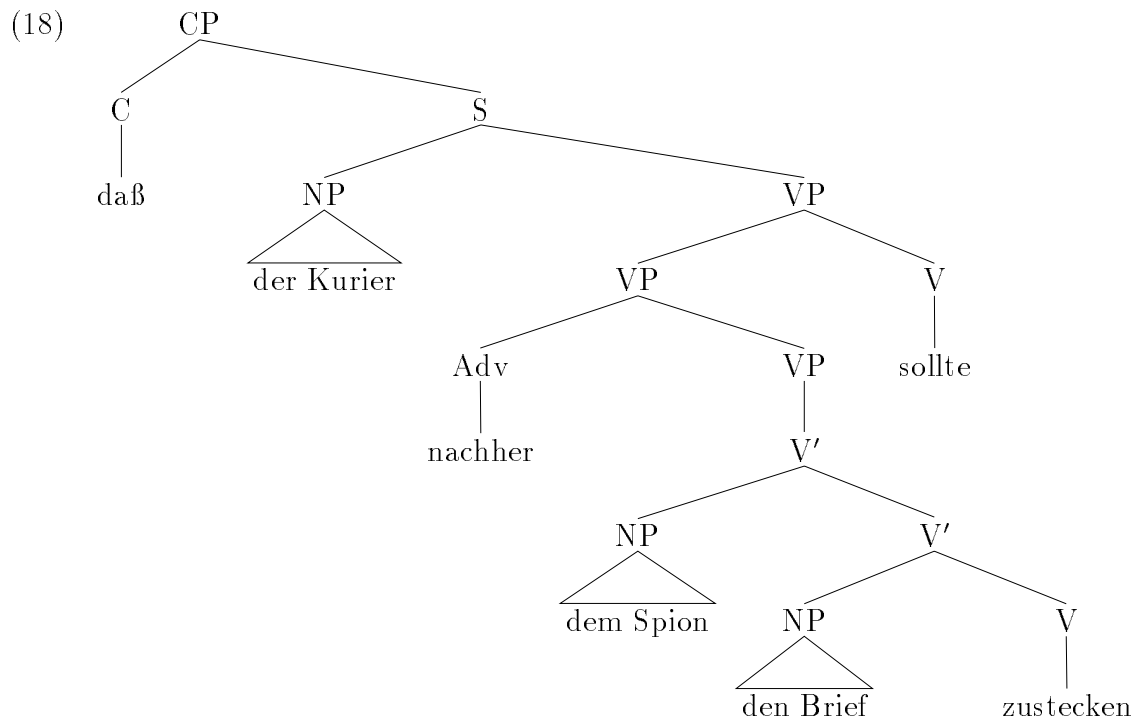
after scrambling. As such, the examples in (16) cannot be regarded as VP topicalization in which the verb is scrambled out, because verbal elements in German (as in many other languages including Korean) cannot scramble. Therefore, it follows that the fronted items in (16) are not a VP constituent, but a non-constituent collection of some members of the VP, and thus they cannot topicalize. Recall that only one constituent is allowed in the initial position.

Note that this assumption does not prevent the verb from topicalizing alone as illustrated in (17).

- (17) [Zustecken] sollte der Kurier nachher dem Spion den Brief.
 slip should the courier(Nom) later the spy(Dat) the note(Acc)
 ‘The courier was supposed to slip the spy the note.’

This example can also be explained as VP topicalization where all members of the VP except the verb are scrambled out.

Thus, I argue that German indeed has a VP projection which does not include the subject. We can then explain the subject/non-subject asymmetry by assuming that the subject is generated as the first daughter of S, i.e. [NP,S], while the other arguments are generated within VP (Webelhuth 1985). Hence, the undetermined category X in (7) has turned out to be S, which in turn contains a hierarchical VP. This structure is illustrated in (18).



Since the C position is filled by the complementizer *daß* ‘that’ as it is an embedded clause, the finite verb *sollte* cannot be positioned there. Hence, it is in the original V position. Since topicalization is not possible in embedded clauses, all elements are within S, i.e. the subject *der Kurier* ‘the courier’ is the first daughter of S, and the rest are within VP. Note that I assume that the indirect or dative object *dem Spion* ‘the spy’ is structurally higher than the direct or accusative object *den Brief* ‘the note’. This is due to the observation by Lenerz (1977), Abraham (1986), and others, that the indirect object precedes the direct object in the default or unmarked order, as I will discuss in section 2.2.⁵

⁵I assume a hierarchical organization of VP where the indirect object c-commands the direct object. However, it could equally well be flat. Although binding facts are often used as evidence for hierarchical structure, it is not clear whether they really constitute genuine (theory-neutral) evidence. As argued by Choi (1995) and Bresnan (1995b), some binding relations, i.e. operator binding of pronominals, are not based on the hierarchical notion of c-command, but on grammatical function ranking and linear precedence. Whether hierarchical or flat, it would not make much

2.2 Canonical Order and Phrase Structural Constraints

Based on the German facts discussed in section 2.1, this section motivates a (set of) phrase structural constraint(s), which will constrain the basic phrase structural description so as to give the canonical phrase structure in (18) as the best output in terms of Optimality Theory (see section 1.2 for the basic assumptions in OT). Since the main concern of this thesis is scrambling, I will concentrate on the basic S structure, within which scrambling is represented by adjunction. In order not to be sidetracked by the V2 effect, I will focus on embedded clause structure.

2.2.1 Canonical Word Order

The basic clause structure proposed in (18) in section 2.1 yields the so-called unmarked or default order of a sentence. For a ditransitive sentence, for instance, it provides the linear order of [Subject—Indirect Object—Direct Object] among the non-verbal elements of the sentence. Consider the following example.

- (19) daß Hans dem Schüler das Buch gegeben hat
 that Hans the Student(Dat) the book(Acc) given has
 ‘that Hans gave the student the book’

The order of the arguments in the clause given in (19) is, of course, not the only possible order which expresses the event that the sentence is describing. As mentioned earlier, any non-verbal element can scramble; therefore, all six permutations of subject, direct object, and indirect object are possible as illustrated in (20). The

difference in our discussion as long as the indirect object precedes the direct object in the default order. See also Bresnan (1996).

“free” order within S is derived by scrambling, i.e. alternative adjunction of phrases either to VP or to S.

- (20) a. daß Hans dem Schüler das Buch gegeben hat
 b. daß Hans das Buch dem Schüler gegeben hat
 c. daß dem Schüler Hans das Buch gegeben hat
 d. daß das Buch Hans dem Schüler gegeben hat
 e. daß dem Schüler das Buch Hans gegeben hat
 f. daß das Buch dem Schüler Hans gegeben hat

All the clauses in (20) have more or less the same truth-conditional meaning. Then, what does it mean that some order of a clause is unmarked or canonical, while others are not? Webelhuth (1985:207) defines the unmarked order as “the word order the native speaker accepts as most natural in a context where none of the referents of the noun phrases involved are known to the hearer or where all these referents are equally well known”. Lenerz (1977) and also Abraham (1986) define the unmarked order as the one which is not constrained by ‘focus’. That is, for example, in the unmarked order in (20a), any element of the sentence can be focused. However, in a scrambled order in (20b) through (20f), only a particular element can be focused (a more detailed discussion of the ‘focus’ constraint is provided in chapter 3).

In sum, the unmarked or canonical order is the order which is not contextually restricted or constrained. In other words, the unmarked order is context neutral. This can be interpreted as meaning that the unmarked order, or the phrase structure which results in that order, is determined only by sentence-internal information, i.e. the morphological or syntactic properties of the component elements of the sentence, and is not influenced by sentence-external factors such as discourse-contextual information.

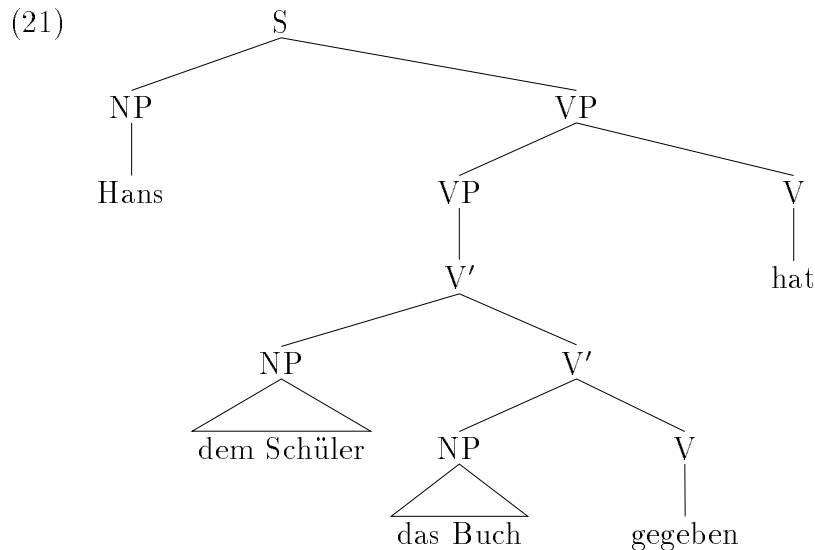
In Optimality Theory, grammar is conceived of as a mapping from inputs to outputs, and a set of universally available well-formedness constraints determine, through EVAL, which one of the outputs is ‘optimal’ for the given input. Viewing the canonical order or structure from this perspective, the canonically ordered structure is the one which is chosen as the optimal output over all other possible phrase structural descriptions, based purely on sentence-internal information. That is, there is a (set of) constraint(s) involved in the mapping of the sentence-internal grammatical information to its phrase structural realization, which the canonical structure does not violate at all or violates minimally, but which non-canonical structures violate more seriously. In other words, this (set of) constraint(s) will favor non-scrambled or non-adjoined canonical structures over scrambled ones, other conditions (which could otherwise affect the decision) being equal. I will call this (set of) constraint(s) CANON, short for ‘canonical’, which will be discussed in the following section.⁶

2.2.2 Phrase Structural Constraints CANON

Flat or Hierarchical?

The canonical phrase structures clearly differ from language to language. Some languages may have ‘configurational’ phrase structures, while others have ‘nonconfigurational’ or ‘flat’ structures. Some may have functional-categorial projections, while others may not. As proposed in section 2.1, German has highly articulated, configurational phrase structures. For example, an embedded ditransitive clause will have the following canonical phrase structure S.

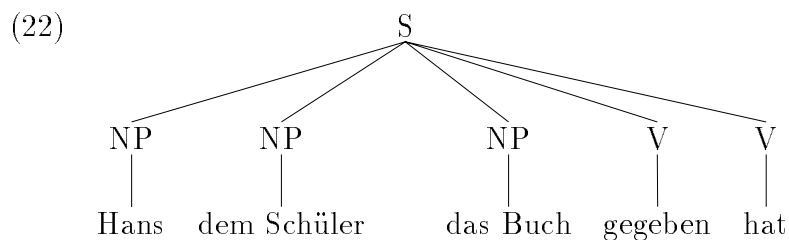
⁶Although I limit my discussion to the constraints relevant to embedded clauses, there are more phrase structural constraints than those involved in giving the canonical S (which will be discussed shortly). For example, the V2 effect must be handled for matrix clauses. See Grimshaw (in press) for other examples of phrase structural constraints, e.g. those which account for the V2 effect in English *wh*-questions.



In Optimality Theory, GEN, which provides syntactic structures in addition to other grammatical structures such as prosodic structures and phonological structures, generates, in principle, “all” possible phrase structures universally available, according to general guidelines of universal principles, e.g. X’ theory. Therefore, given X’-theory, or the theory of phrase structures adopted here (Kroeger 1993, King 1993, Bresnan 1995a), it can generate the completely flat structure in (22), for example, as below, in addition to the structure in (21).⁷

⁷That flat structures are possible means that phrase structural information is not used to map argument roles to grammatical functions in certain languages (Bresnan 1995a, Austin and Bresnan to appear). In that case, morphological information such as case marking is responsible for the determination of grammatical functions. An example of the constraint which deals with the mapping between case marking and grammatical functions is presented below (Bresnan 1996).

- (i) Case to f-structure Alignment:
 Obliqueness of case aligns with obliqueness of function (reverse syntactic rank).
 (A nominative c-structure constituent is an f-structure Subj, and accusative c-structure constituent is an f-structure Obj, etc.)



Based on the discussion in section 2.1, the more articulated structure in (21) wins over the flat structure in (22) in German. In Optimality Theory, this means that the phrase structural description in (22) violates some higher constraint which the phrase structural description in (21) does not violate. The phrase structure (21) could violate other constraints and yet still be optimal as long as the constraints it violates are lower in rank than the one the structure in (22) violates.

Following Bresnan (1996), I propose that the choice between (21) and (22) in German results from competition between two conflicting constraints. One is *ECONOMY OF EXPRESSION* and the other is *ENDOCENTRICITY ALIGNMENT*, which are given below in (23) and (24) respectively.

(23) Economy of Expression:

Do not project.

(24) Endocentricity Alignment:

- a. Heads align. (A c-structure head is an f-structure head.)
- b. Complements of lexical categories align. (The c-structure complement of a lexical category is an f-structure complement.)

The first constraint *ECONOMY OF EXPRESSION* is a general constraint against building unnecessary categorial structures. It prefers simpler phrase structures unless more complicated structures are required for some other reason.

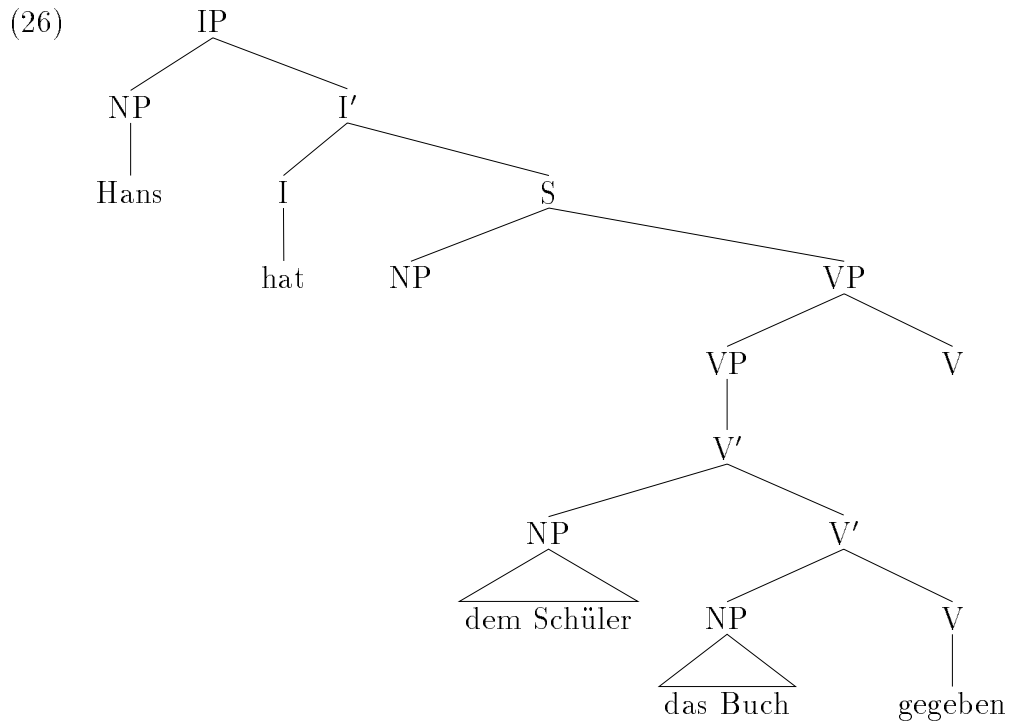
The second constraint *ENDOCENTRICITY ALIGNMENT*, in contrast, requires building more hierarchical structures. The first requirement states that a f-structure head,

e.g. a verbal PRED, is the head of its c-structural projection, e.g. VP, and the second requirement states that a f-structure complement such as an OBJ is a c-structure complement, i.e. a structural sister of the head of a lexical category such as V. Therefore, this constraint will prefer structures which have a discrete VP which consists of the head V and the complements (such as objects) as its structural sisters. The fact that German has evidence for VP, as discussed in section 2.1, requires that German rank the ENDOCENTRICITY ALIGNMENT constraint higher than the ECONOMY OF EXPRESSION constraint. In contrast, so-called ‘nonconfigurational’ languages would rank them the other way around. (In addition, a directionality constraint, e.g. HEAD-FINAL, is required to generate the right branching rather than the left-branching structures.)

(25) Ranking:

ENDOCENTRICITY \gg ECONOMY

Why, then, would German not have the more articulated structure involving an IP projection, for example? Why does the structure in (21) still win over the structure in (26)?



Notice that although German ranks ECONOMY OF EXPRESSION lower than ENDOCENTRICITY ALIGNMENT, when two structures equally satisfy the second constraint, then the grammar will prefer the one which minimally violates the first constraint. For example, unless German has another constraint which favors the IP structure over S, e.g. one that requires that the inflected verb be in I, (22) would be preferred over (26) because the latter unnecessarily builds up one more projection, i.e. IP, which violates ECONOMY OF EXPRESSION. This is illustrated in (27).

(27)

CANDIDATES	ENDOCENTRICITY	ECONOMY
☺ (22) S		
(26) IP		*

CANON: Grammatical Relations or Thematic Roles?

The constraints introduced above cannot yet distinguish the unmarked order from scrambled orders. Recall that in a ditransitive clause, [Subject—Indirect Object—Object] is the unmarked or canonical order, as shown in (28).

- (28) daß Hans dem Schüler das Buch gegeben hat
 that Hans the Student(Dat) the book(Acc) given has
 ‘that Hans gave the student the book’

This is the order which is context independent and not subject to the focus constraint (Lenerz 1977, Abraham 1986). Thus, it should be determined only by sentence-internal information such as argument structure, case marking, and grammatical relations among the elements of the sentence.

In a nonderivational framework like LFG, which is organized into copresent parallel structures (i.e. a(rgument)-structure, f(unctional)-structure, and c(onstituent)-structure), the information flow between different types of structures can be regarded as being controlled by a set of mapping or correspondence constraints.⁸ A(rgument)-structure is where the predicate-argument information, i.e. thematic relations of the predicate with its arguments, is represented; f(unctional)-structure is where the information about the elements’ grammatical relations such as subject, object, and adjuncts, etc. is represented; finally, c(onstituent)-structure is equivalent to phrase structure in that the information about category and constituency of phrases is represented.

The constituent ordering phenomena can be conceived of as being derived from the interplay between the c-structure and the other parallel structures in terms of

⁸See Bresnan (1996) for the organization and operation of grammar based on the OT ideas, and also for examples of the application of categorization and alignment constraints to the ‘verb movement’ phenomenon in English.

correspondence constraints. Suppose initially that the unmarked phrase structure in German is determined by the interaction between f-structure and c-structure. Namely, information about the grammatical relations determines the constituent order and hierarchy among the elements of the sentence.

Let me first assume, with Bresnan (1995c) and Mohanan and Mohanan (1994), among others, that there is a universal hierarchy of grammatical functions (cf. the ‘Accessibility Hierarchy’ in Keenan and Comrie (1977)), which is given in (29).⁹

(29) Functional Hierarchy:

SUBJ > OBJ > OBJ_θ > OBL > ADJUNCT

Based on this functional hierarchy, I propose the phrase structural constraints in (30), which will capture the ‘canonical’ or ‘unmarked’ order described earlier in this chapter. This set of constraints controls the mapping between the grammatical functional information and the constituent structure. I call them *CANON_{gf}*, short for ‘canonical’ order based on ‘grammatical functions’.

(30) *CANON_{gf}*:

- a. CN1 SUBJ should be structurally more prominent than (e.g. ‘c-command’) non-SUBJ functions.
- b. CN2 Non-SUBJ functions align reversely with the c-structure according to the functional hierarchy.

These constraints, in conjunction with the ENDOCENTRICITY ALIGNMENT constraint introduced in the previous subsection, have the effect of generating the ‘canonical’ structure, i.e. Subject as the first daughter of S, and Direct Object as the closest sister of V, or the closest daughter of V' to V, and then Indirect Object as the next closest

⁹The distinction between OBJ and OBJ_θ can be equated with that between direct (accusative) and indirect (dative) objects in a ditransitive clause for present purposes.

daughter of V' , i.e. [_S SUBJ [_{VP} I.OBJ D.OBJ V]], thus yielding the ‘canonical’ order of [Subject—Indirect Object—Direct Object] as shown in example (28). Note that the ‘reverse’ alignment requirement CN2 puts the higher function Direct Object (OBJ in (29)) lower in the c-structure. This will also put adverbs (ADJUNCT) before all non-SUBJ arguments. The idea of the reverse alignment of non-Subject functions originates from Mohanan and Mohanan (1994:170–171) in their discussion of Hindi word order although they assume a non-hierarchical structure for Hindi.

However, a closer examination of German word order indicates that the canonical order may not be solely determined by the grammatical functional information. That is, it also seems to be affected by the thematic roles of the arguments. A version of the thematic hierarchy is presented in (31) (Kiparsky 1987, Mohanan 1990, Bresnan 1987, Bresnan and Kanerva 1989, Bresnan and Zaenen 1990, Bresnan 1995c).

(31) Thematic Hierarchy:

Agent > Beneficiary > Experiencer/Goal > Instrument > Patient/Theme >
Locative

According to the ‘focus constraint’ test for unmarked order by Lenerz (1977) and Abraham (1986) (i.e. default-ordered arguments are not restricted in focus assignment), in certain constructions, the subject (nominative argument), which is functionally highest, does not necessarily precede object or non-subject arguments, which are functionally lower, in default order. First compare (32) and (33) (Abraham 1986:23–25).

(32) daß der Chirurg dem Mann hilft
 that the surgeon(Nom) the man(Dat) helps
 ‘that the surgeon helps the man’

- (33) a. daß die Kur dem Mann hilft
 that the cure(Nom) the man(Dat) helps
 ‘that the cure helps the man’
- b. daß dem Mann die Kur hilft
 that the man(Dat) the cure(Nom) helps
 ‘that the cure helps the man’

Although both (32) and (33) have the same verb *helfen* ‘help’ as their predicate, they show different patterns in terms of argument structure. (32) takes an agent subject and a patient object, and it is clear here that the canonical order is [Subject—Object]. The reverse order is considered fairly marked. On the other hand, (33) takes a non-agent (theme/instrument) subject and a beneficiary object. In this case, neither (33a) or (33b) is restricted in focus assignment, which means that both are unmarked default orders.

Abraham (1986:23–25) reports that a certain group of verbs called “symmetrical” verbs such as *ähneln* ‘resemble’, *begegnen* ‘meet’, *treffen* ‘meet’, *gegenüberstehen* ‘stand opposite to’, also show a similar pattern with respect to the focus assignment. Not unexpectedly, “psych” verbs, such as *gefallen* ‘please’, *stören* ‘irritate’, *schaden* ‘be to the detriment of’, *behagen* ‘please’, also do not necessarily prefer the subject to precede other arguments (den Besten 1982, Abraham 1986, Webelhuth 1992), as illustrated in (34).

- (34) a. weil dem Jungen das Buch gefallen hat
 because the boy(Dat) the book(Nom) please hat
 ‘because the book pleased the boy’

- b. weil das Buch dem Jungen gefallen hat
 because the book(Nom) the boy(Dat) please hat
 ‘because the book pleased the boy’

Notice again that the subject *das Buch* ‘the book’ here is the theme while the oblique argument *dem Jungen* ‘the boy’ is the experiencer. That is, although *das Buch* is functionally higher than *dem Jungen*, it is lower thematically.

Finally, also in passive constructions, the theme subject may or may not precede other (e.g. goal) arguments in the default order, as shown in (35) (Lenerz 1977:116).

- (35) a. daß dem Albrecht die Torte geschickt worden ist
 that the Albrecht(Dat) the cake(Nom) sent been has
 ‘that the cake was sent to Albrecht’
- b. daß die Torte dem Albrecht geschickt worden ist
 that the cake(Nom) the Albrecht(Dat) sent been has
 ‘that the cake was sent to Albrecht’

Here again, the subject is lower than the non-subject argument in terms of thematic hierarchy.

The above examples show that the thematic hierarchy as well as the grammatical functional hierarchy plays a crucial role in determining the canonical order. Therefore, I propose another ‘canonical-order’ constraint, based on the thematic hierarchy. I will call this constraint $CANON_{\theta}$.

- (36) $CANON_{\theta}$:

Align elements according to the thematic hierarchy.

Note that this is a correspondence constraint mapping between a(rgument)-structure and c(onstituent)-structure.

As a matter of fact, $CANON_{\theta}$ also can explain the canonical order of the ditransitive clause repeated here in (37). Since the subject *Hans* is an agent, the indirect object *dem Schüler* is a goal, and the direct object *das Buch* is a theme, all the arguments are aligned according to the thematic hierarchy in (37).

- (37) daß Hans dem Schüler das Buch gegeben hat
 that Hans the student(Dat) the book(Acc) given has
 ‘that Hans gave the student the book’

That is, in regular transitive or ditransitive clauses, both $CANON_{gf}$ and $CANON_{\theta}$ predict the same canonical order among the arguments.

However, in the constructions demonstrated in (33) through (35) above, the thematic roles of the arguments do not match their grammatical functions in terms of hierarchy. And, in these examples, the canonical order seems to be either the one determined by $CANON_{gf}$ or the one determined by $CANON_{\theta}$. In other words, the canonical order realized in c(onstituent)-structure is determined both by the interaction with f(unctional)-structure and with a(rgument)-structure.

One way to capture this joint effect of two constraints is to think of them as ‘tied’ constraints, which are not ranked with respect to each other so that they participate equally in the decision.¹⁰ For ease of exposition, though, I will only use $CANON_{gf}$, which is based on the functional hierarchy, and simply call it $CANON$ for the rest of the discussion because as far as active (di)transitive sentences are concerned, which are the major concern of this thesis, $CANON_{gf}$ and $CANON_{\theta}$ do not differ in their predictions.

¹⁰I do not explore here the exact application of these tied constraints. See Pesetsky (1993), Broihier (1995), Anttila (1995), and Smolensky (1995) for discussion of tied constraints.

CANON and Canonical Order

Now, let us see how this new set of constraints *CANON* distinguishes the canonical order from scrambled non-canonical orders. *CANON* is repeated in (38).

(38) *CANON*:

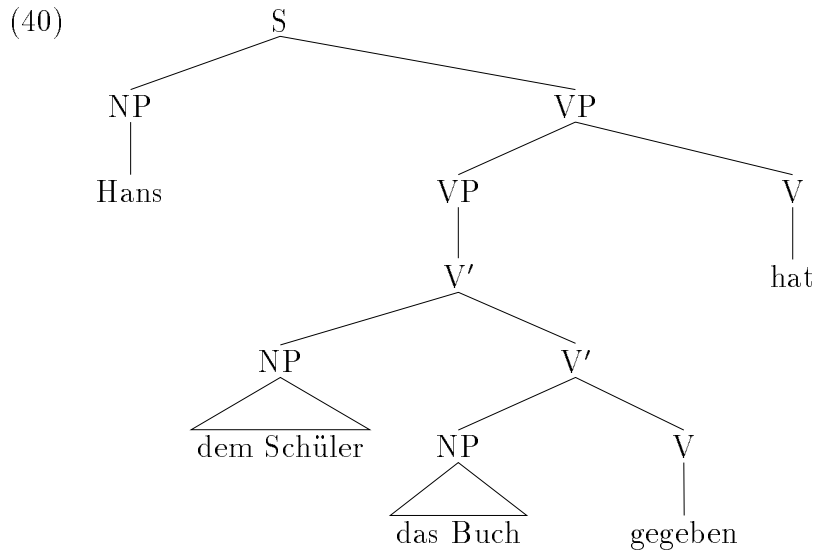
- a. CN1 SUBJ should be structurally more prominent than (e.g. ‘c-command’) non-SUBJ functions.
- b. CN2 Non-SUBJ functions align reversely with the c-structure according to the functional hierarchy.

Note that these constraints are defined in terms of “structural prominence”. Structural prominence can be either linear precedence or structural dominance in the hierarchy. Recall that whether or not the structure is hierarchical is determined by the *ENDOCENTRICITY ALIGNMENT* constraint, and whether it is right-branching or left-branching is determined by the *DIRECTIONALITY* constraints. Since German has hierarchical structures which are right-branching, as discussed above, a structurally more prominent (c-commanding) element also precedes a structurally less prominent element. In effect, the first part CN1 requires that the subject precede all non-subject arguments, and the second part CN2 requires that the indirect object precede the direct object when there are two non-subject arguments. Therefore, in a ditransitive sentence which has three arguments, these subconstraints together produce the following ‘subhierarchies’ among the arguments (Baković 1995).

- (39) a. SUBJ \prec I.OBJ
 b. SUBJ \prec D.OBJ
 c. I.OBJ \prec D.OBJ

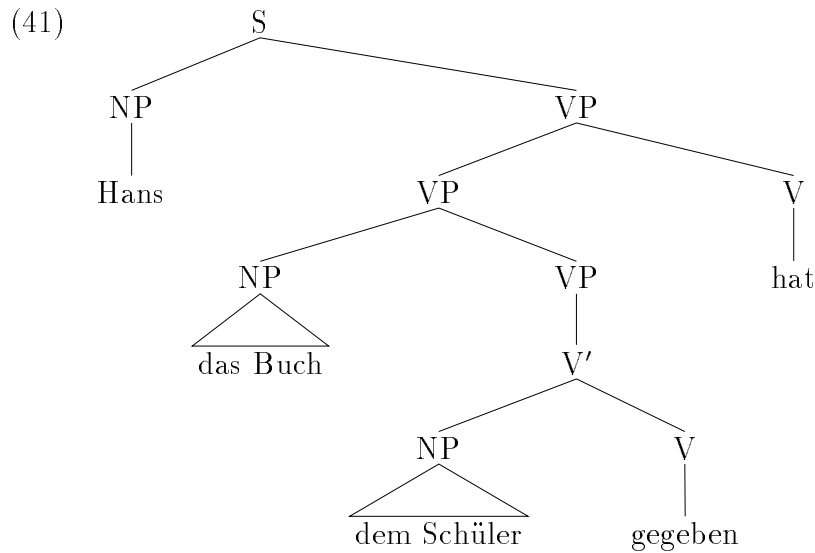
Thus, if the relative order in any pair of these arguments is reversed, *CANON* is violated. Also, *CANON* has a cumulative violation effect; so two violations is more serious than one violation.

First consider the phrase structure in (40).

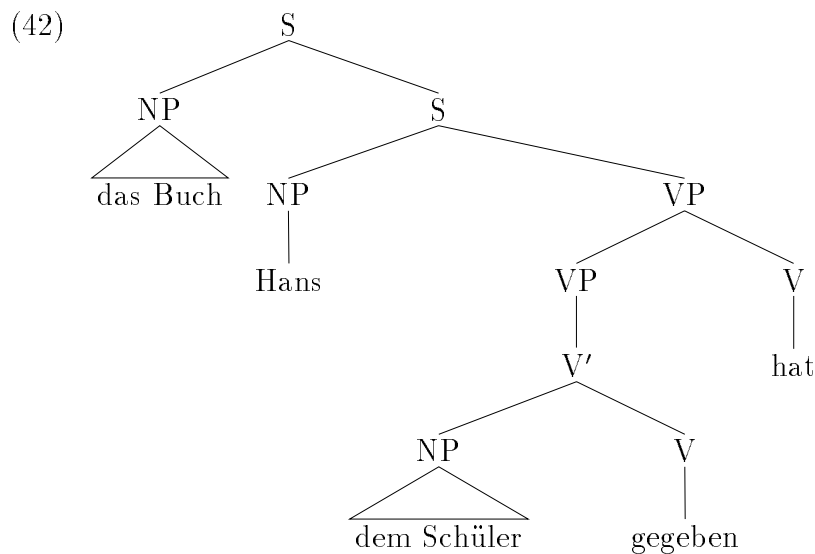


This structure is exactly like the one described by the CANON constraints. The subject *Hans* is the first daughter of S, the direct object *das Buch* ‘the book’ is the closest sister to V, and the indirect object *dem Schüler* ‘the student’ is the next closest. Thus, Subject c-commands all non-subject arguments and then the non-subject arguments are reversely aligned so that the lower-ranked Indirect Object c-commands the higher-ranked Direct Object. That is, this structure does not violate CANON.

Then, what about other scrambled structures? Let us now compare the scrambled structures given in (41) and (42) with the canonical one given in (40). First, in (41), the direct object *das Buch* ‘the book’ is adjoined to VP, thus disturbing the subhierarchy and order of [Indirect Object—Direct Object] and hence violating the second part of CANON, i.e. that the non-subject functions should be reversely aligned. So, this structure incurs one * mark.



In (42), on the other hand, the direct object *das Buch* is adjoined to S.



This structure not only violates the subhierarchy and order of [Indirect Object—Direct Object], but also disturbs that of [Subject—Direct Object]. That is, it now violates the constraint that Subject should ‘c-command’ non-Subjects, in addition to the constraint of reverse alignment among non-Subject functions. Namely, this

structure gets one * mark for CN1 and another * mark for CN2. Therefore, the structure in (42) is worse than that in (41).

To summarize, the CANON constraints have the effect of favoring the canonical structure which has the order of [Subject—Indirect Object—Direct Object] over other scrambled structures, other things being equal. Thus, if any part of this canonical order is disturbed, CANON will be violated. In addition, this constraint has a cumulative violation effect. This way, CANON not only has the effect of favoring the canonical structure, but also of differentiating among different scrambled structures: it punishes some scrambled structures more severely than others, e.g. making (42) worse than (41).¹¹ Note that CANON actually consists of two separate ‘subconstraints’, i.e. CN1 and CN2. This split will play a crucial role in explaining the fact that in German scrambling over a subject is much worse than scrambling over a non-subject argument (Webelhuth 1985). We will see how this works later in chapter 4. (43) provides examples of the CANON violations in the various orders of a ditransitive sentence.

(43)

	CANDIDATES			CANON
a.	Subject	I.Object	D.Object	
b.	Subject	D.Object	I.Object	*
c.	I.Object	Subject	D.Object	*
d.	D.Object	Subject	I.Object	**
e.	I.Object	D.Object	Subject	**
f.	D.Object	I.Object	Subject	***

Notice here that in (e) and (f), both Indirect Object and Direct Object violate CN1 by c-commanding Subject, which is considered to be two separate violations, thus incurring two marks.

¹¹This constraint can be conceived of as having a similar effect to the MINLINK constraint in Legendre et al. (1995a) in the sense that it favors shorter ‘movement’ if possible (Chomsky 1993).

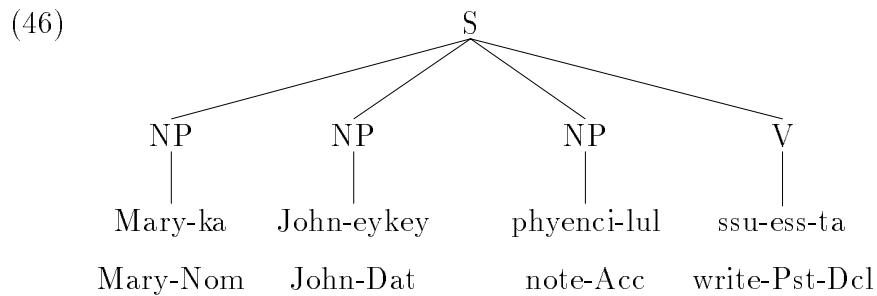
Now we have established the phrase structural constraints *CANON* for German, which, together with *ENDOCENTRICITY ALIGNMENT*, yields the basic clause structure and canonical word order of [_S Subject [_{VP} I.Object D.Object]] in this language. In the last section of this chapter, I will present arguments for the basic phrase structure in Korean. As mentioned earlier in this chapter, Korean also shares the configurational S structure and the canonical order among elements with German, thus the phrase structural constraints which apply to German will also apply to Korean. The only difference lies in the way Korean applies the two subconstraints of *CANON*. This is contingent on the issue of scrambling over the subject and will be discussed in chapter 5 in comparison with German.

2.3 Phrase Structure in Korean

Korean, like German, has several properties considered diagnostic of non-configurational languages (Hale 1982, 1983) including free word order as well as a rich case system. Word order in Korean is fairly free except that the verb is fixed in the clause-final position as shown in (45), which has led some people to propose a non-configurational structure such as (46) (e.g. Chung 1993).

- (44) Mary-ka John-eykey phyenci-lul ssu-ess-ta.
 Mary-Nom John-Dat letter-Acc write-Pst-Dcl
 ‘Mary wrote John a letter.’

- (45) a. Mary-ka John-eykey phyenci-lul ssu-ess-ta.
 b. Mary-ka phyenci-lul John-eykey ssu-ess-ta.
 c. John-eykey Mary-ka phyenci-lul ssu-ess-ta.
 d. John-eykey phyenci-lul Mary-ka ssu-ess-ta.
 e. phyenci-lul Mary-ka John-eykey ssu-ess-ta.
 f. phyenci-lul John-eykey Mary-ka ssu-ess-ta.



However, Korean also demonstrates several of the classic phenomena of a verb phrase language just like German. A verb and its objects are often involved in syntactic operations, but not a verb and its subject. I examine VP topicalization and the focus domain effect (see Choe (1985) and Bratt (1995) for more detailed arguments). From the results of these tests, I posit an underlying configurational S structure for Korean too. In the last section, I argue against functional projections in Korean (see also Kim (1996)) and maintain the uniform S structure for both matrix and embedded clauses in Korean.

2.3.1 Evidence for VP in Korean

VP Topicalization

‘Topicalization’ in Korean is a case of fronting, where a constituent is fronted and marked by the ‘topic’ marker *nun*.¹² As demonstrated in (47), a VP, which includes all non-subject arguments but excludes the subject, can be fronted.

- (47) a. [ttuy-ki-nun]_{VP} Mary-ka ppalli ha-n-ta.
 run-Nml-Top Mary-Nom fast do-Prs-Dcl
 ‘As for running, Mary does (it) fast.’
- b. [chayk-ul ilk-ki-nun]_{VP} Mary-ka yelsimhi hay-ss-ta.
 book-Acc read-Nml-Top Mary-Nom diligently do-Pst-Dcl
 ‘As for reading a book, Mary did (it) diligently.’
- c. [emeni-eykey phyenci-lul ssu-ki-nun]_{VP} Mary-ka mayil hay-yaha-n-ta.
 mother-Dat letter-Acc write-Nml-Top Mary-Nom everyday do-should-Prs-Dcl
 ‘As for writing (her) mother a letter, Mary should do (it) everyday.’

The VP gap is filled by a *pro*-verb *ha* in (47), or it can optionally be filled by a reduplicated verb form.¹³ The fronted VP is interpreted as a ‘topic’ of the sentence, i.e. something that the sentence is ‘about’.

As expected, however, the subject and the verb cannot be fronted together leaving objects behind. This is shown in (48).

¹²Later in chapter 5, I argue that topichood in Korean is not in fact directly encoded by the so-called topic marker *nun* (see Choi (in press) for a similar proposal). This, however, is not crucial for the purposes of this chapter.

¹³Some examples sound better with reduplicated verbs, the reason for which is not very clear to me.

- (48) a. *[Mary-ka ttuy-ki-nun] ppalli ha-n-ta.
 Mary-Nom run-Nml-Top fast do-Prs-Dcl
 ‘As for Mary’s running, (she) does (it) fast.’
- b. *[Mary-ka ilk-ki-nun] yelsimhi chayk-ul hay-ss-ta.
 Mary-Nom read-Nml-Top diligently book-Acc do-Pst-Dcl
 ‘As for Mary’s reading, (she) did a book diligently.’
- c. *[Mary-ka ssu-ki-nun] mayil emeni-eykey phyenci-lul hay-yaha-n-ta.
 Mary-Nom write-Nml-Top everyday mother-Dat letter-Acc do-should-Prs-Dcl
 ‘As for Mary’s writing, (she) should do (her) mother a letter everyday.’

It is interesting to note that even when the fronted item, i.e. the subject and verb, is changed to a more general or generic expression such as ‘lions’ eating’, the sentence does not improve significantly. This is shown in (49).

- (49) *[saca-ka mek-ki-nun] sayngkoki-lul ha-n-ta.
 lion-Nom eat-Nml-Top raw meat-Acc do-Prs-Dcl
 ‘As for lions’ eating, (they) do raw meat.’

This indicates that the fronted items should constitute a syntactic constituent and that the impossibility of fronting a subject and a verb in (48) is not due to semantic awkwardness because a semantically plausible unit cannot topicalize either, as shown in (49). The examples in (48) and (49) contrast with the examples in (47), which shows that a verb and its objects form a constituent while a verb and a subject do not.¹⁴

¹⁴Remnant topicalization in Korean does not appear to be as free as in German. Although [direct object + verb] can quite easily topicalize leaving the indirect object behind as illustrated in (i)a, [indirect object + verb] cannot do so as easily.

VP Focus

Another construction which involves *nun*-marking is the ‘focus’ construction.¹⁵ When an element is marked with *nun* in its base position, it usually carries ‘contrastive focus’. For example, when the object *chayk* ‘book’ in (50) is marked with *nun*, it carries contrastive focus and thus the sentence implies something like ‘Mary reads BOOKS, but she does not read NEWSPAPERS’ as shown in (50a).

- (50) a. Mary-ka [chayk-un]_F ilk-nun-ta.
 Mary-Nom book-Top read-Prs-Dcl
 ‘Mary reads books (but reads nothing else).’
- b. Mary-ka [chayk-un ilk-nun-ta]_F.
 Mary-Nom book-Top read-Prs-Dcl
 ‘Mary reads books (but does nothing else).’

Interestingly, the domain of focus can be expanded to the VP when the object is focused. For instance, the whole VP *chayk-ul ilk-nun-ta* ‘read books’ in (50) can be focused so that the sentence can mean something like ‘Mary READS BOOKS, but she does not WRITE PAPERS’ as shown in (50b). Importantly, however, the focus cannot be projected to the whole sentence. That is, the subject *Mary* in (50) cannot

-
- (i) a. [phyenci-lul ssu-ki-nun]_{VP} Mary-ka mayil emeni-eykey hay-yaha-n-ta.
 letter-Acc write-Nml-Top Mary-Nom everyday mother-Dat do-should-Prs-Dcl
 ‘As for writing a letter, Mary should do (it) to (her) mother everyday.’
- b. ??[emeni-eykey ssu-ki-nun]_{VP} Mary-ka mayil phyenci-lul hay-yaha-n-ta.
 mother-Dat write-Nml-Top Mary-Nom everyday letter-Acc do-should-Prs-Dcl
 ‘As for writing to (her) mother, Mary should do a letter everyday.’

¹⁵See chapter 5 for discussion of the double function of *nun*, one as a topic marker and one as a focus marker.

be included in the focus domain.¹⁶

A similar pattern appears with a verb focused. When a verb is marked with *nun*, the verb can carry contrastive focus by itself as shown in (51). Additionally, any part of the VP including the entire VP can be focused, but never the subject (Kang 1988:16–20).

- (51) a. Mary-ka [ttuy-ki-nun]_F ha-n-ta.
 Mary-Nom run-Nml-Top do-Prs-Dcl
 ‘Mary does run.’
- b. Mary-ka [chayk-ul ilk-ki-nun]_F hay-ss-ta.
 Mary-Nom book-Acc read-Nml-Top do-Pst-Dcl
 ‘Mary did read a book.’
- c. Mary-ka [emeni-eykey phyenci-lul ssu-ki-nun]_F hay-ss-ta.
 Mary-Nom mother-Dat letter-Acc write-Nml-Top do-Pst-Dcl
 ‘Mary did write (her) mother a letter.’

So for instance, (51c), in the above examples, can mean one of the following:

- (52) a. Mary WROTE a letter to her mother, but she did not SEND it to her.
 b. Mary WROTE A LETTER to her mother, but she did not SEND
 A PRESENT to her.
 c. Mary WROTE A LETTER TO HER MOTHER, but she did not SEND
 A PRESENT TO HER FATHER.

¹⁶This focus projection is comparable to the focus association phenomenon with such adverbs as *only* and *even* in English.

(i) a. I only ate [CABBAGE]_F.
 b. I only [ate CABBAGE]_F.

See Jackendoff (1972), Selkirk (1984), Rooth (1985), and Diesing (1992) for discussions of this phenomenon.

However, it is hard to get a reading like (53) for (51c):

- (53) MARY WROTE A LETTER TO HER MOTHER,
 but JOHN did not SEND A PRESENT TO HER FATHER.

As such, the focus projection with *nun*-marking shows that the VP is some sort of a domain which the focus can project within, but not beyond, and thus argues for a separate syntactic projection.

Phonological Support for VP

There is also phonological evidence in favor of the existence of a VP in Korean in addition to the syntactic evidence shown in the previous sections. Phonological phrasing often hinges on syntactic phrase structures. Cho (1990) has presented phonological phrase formation in Korean as phonological evidence for the existence of VP. The evidence comes from a contrast between subject and non-subject arguments in forming phonological phrases in the application of the Obstruent Voicing rule (see Cho 1990:50–55 for details of phonological phrase formation).

Obstruent Voicing in Korean is a rule which changes plain obstruents, i.e. /p/, /t/, /k/, and /c/, into their voiced counterparts, i.e. [b], [d], [g], and [j] respectively, when an obstruent occurs between voiced segments such as vowels or nasals. This rule applies not only within words, but also across words within a phonological phrase. (In the following examples, a voiced segment is underlined and a phonological phrase is represented with square brackets in the following examples.)

- (54) a. [Cwuni-ka] [kong-ul cayppalli cap-a].
 Cwuni-Nom ball-Acc quickly catch-Prs
 ‘Cwuni catches balls quickly.’

- b. [kong-ul] [Cwuni-ka] [cayppalli cap-a].
 ball-Acc Cwuni-Nom quickly catch-Prs
 ‘Balls Cwuni catches quickly.’

The crucial contrast occurs in the first consonant of the adverb *cayppalli* ‘quickly’, which is voiced when directly preceded by the object in (54a), and not voiced when preceded by the subject in (54b). This indicates that the object *kong-ul* ‘ball-Acc’ occurs within the same phonological phrase as the adverb *cayppalli* ‘quickly’, and that the subject *Cwuni-ka* ‘Cwuni-Nom’ does not occur within the same phrase as *cayppalli* ‘quickly’. In other words, the VP is a necessary syntactic constituent for explaining phonological phrasing in Korean.

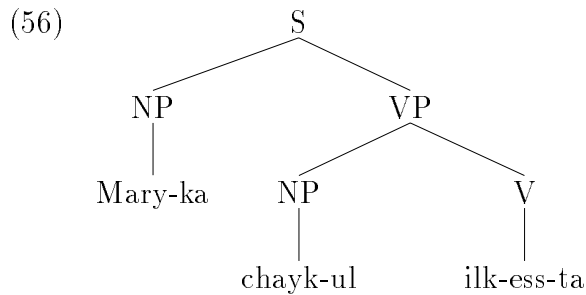
To summarize, a VP exists in Korean which includes all non-subject arguments and excludes the subject. Its presence has been attested by topicalization and focus projection. Also, there is phonological evidence which comes from phonological phrase formation in Korean.¹⁷ In the next subsection, I will argue, following Cho and Sells (1995), that no functional projections are necessary in Korean.

2.3.2 Coordination and Clause Structure

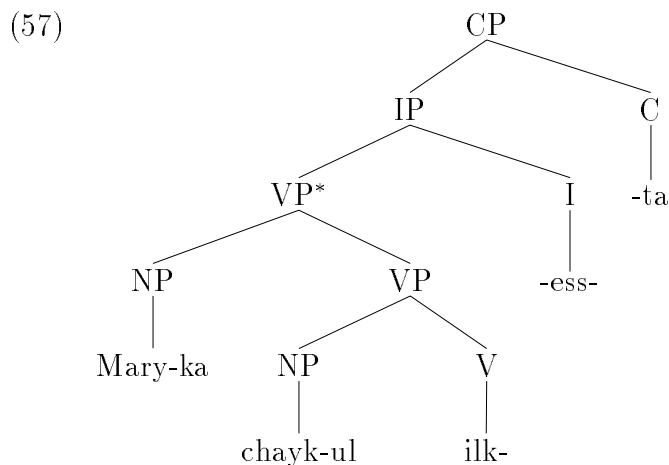
I have focused on the subject/object asymmetry in section 2.3.1 and concluded that Korean has a VP. This alone would give us a clause structure like (56), without additional evidence for positing a more articulated structure.

- (55) Mary-ka chayk-ul ilk-ess-ta.
 Mary-Nom book-Acc read-Pst-Dcl
 ‘Mary read a book.’

¹⁷See Bratt (1995) for more detailed arguments in favor of a VP in Korean.



Recently, however, there have been several proposals in the literature on Korean (as well as in that on Japanese) to treat verbal inflectional morphemes, such as tense and mood elements, as discrete syntactic phrasal heads, especially of such functional categories as IP and CP (or TP and MP for tense and mood respectively).¹⁸ They are motivated by theories of phrase structure based on head movement and extended X'-theory (Chomsky 1986, Pollock 1989). Under this assumption, the sentence in (55) would be represented as in (57).¹⁹



¹⁸For this type of phrase structure for Korean, see Whitman (1989), Yoon (1993), and Yoon and Yoon (1990) among many others. Some linguists (Ahn 1991, Ahn and Yoon 1989) suggest that the honorific marker *si* and the negative marker *anh* are also syntactic heads in Korean, i.e. Agr and Neg respectively. Arguments against this proposal are detailed in Han (1991) and Sells (1995). Therefore, I will not discuss Agr and Neg here and only concentrate on I and C.

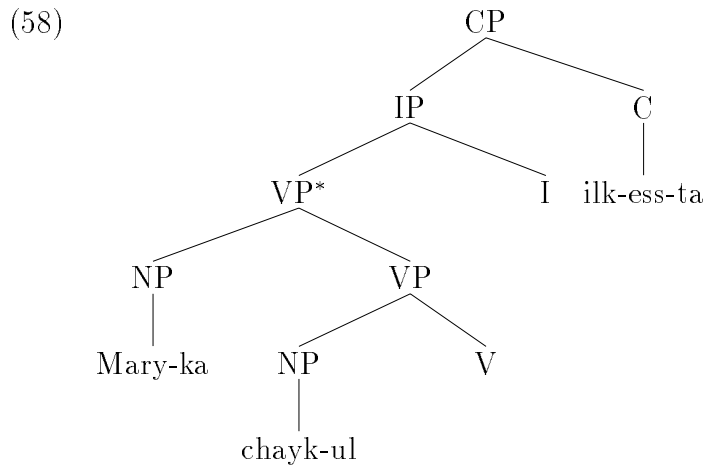
¹⁹I use VP* following Yoon (1993, 1994). However, it is in essence equivalent to S in the current framework as a category which contains a subject and a separate verbal maximal projection.

In this type of analysis, only the verb stem is generated under the V node and the tense and the mood morphemes are generated separately under I and C. The verb stem *ilk* ‘read’ is supposed to form a unit with the tense and mood morphemes *ess* ‘Past’ and *ta* ‘Declarative’ by Head Movement, i.e. V to I to C (Whitman 1989, Ahn and Yoon 1989, Ahn 1991), or by Phrasal Affixation (Yoon 1993, Yoon 1994). In other words, the morphological process of affixation is taken over by a syntactic mechanism.

A lexicalist view of morphology, including the lexical integrity principle, prohibits a phrase structure such as (57) and the syntactic take-over of morphological processes. In such a view, words which feed syntactic phrase structures are unanalyzable units, and thus stems, affixes, and other bound morphemes are combined in the lexicon and not in syntax. In other words, the principles and constraints which are involved in morphological composition are different from those which constrain syntactic operations.

An alternative to the syntactic “building” view on morphology is a base-generation approach within a lexical, constraint-based framework (Kroeger 1993 for Tagalog and King 1993 for Russian). In these works, verb movement is replaced by optional generation of the head category in either its source or target position. It is a compromise between the two approaches illustrated above in the sense that it adopts the extended X'-theory but still maintains the lexical integrity principle. (58) is an example of a phrase structural representation of this view.²⁰

²⁰The “checking” theory (Chomsky 1992, 1993) could be viewed as analogous to the approach introduced here in that verbs are inserted in the syntax fully inflected, although they still need to move to the appropriate functional heads to “check off” the relevant features.



In what follows, I first introduce morphophonological evidence which shows that verbal inflections in Korean are ‘lexical’: they combine with stems in the lexicon and thus verbs are inserted in their fully inflected form in syntax (Cho and Sells 1995). Next, I review the syntactic arguments for the existence of the functional categories IP and CP in Korean, and conclude that there is no crucial evidence for such a distinction. The main arguments come from coordination.

Verbal Inflections are ‘Lexical’

Though it is uncontroversial that the tense and mood morphemes in Korean are phonologically dependent on the preceding word or morpheme, their morphological or syntactic status is still in question. The major arguments for the syntactic treatment are based on such syntactic generalizations as the phrasal distribution of these morphemes and their scope: if one assumes that these morphemes are attached to syntactically-formed phrases rather than to the base-generated verb stems, their phrasal or sentential scope falls out from the phrase structure. One easy resolution to the problem of the phonological dependency on the one hand and the phrasal scope on the other would be to assume that these morphemes are clitics. However, Cho and Sells (1995) argue that the mere fact that these elements play an important role in

syntax and semantics should not necessarily lead to the conclusion that they should be handled by post-syntactic morphology or cliticization (see Poser (1985) and Kanerva (1987) for similar cases). Moreover, the Korean suffixes show strong phonological evidence that they are lexically attached.

One of the properties which distinguish affixes from clitics is the morphological sensitivity of certain lexical rules (Zwicky and Pullum 1983, Sadock 1980). One such rule is Coda Neutralization. Cho and Sells (1995) demonstrate that the affixation of tense and mood morphemes in Korean shows lexical, rather than post-lexical, behavior in the sense of Lexical Phonology (Kiparsky 1982, 1985, Mohanan 1985). The phonological rule, Coda Neutralization, neutralizes a coda continuant to a stop, a palatal to a dental, and a laryngeal to a plain stop, in syllable coda position. However, when a continuant is syllabified lexically as the onset of the following suffix, it escapes the application of Coda Neutralization. Lexical syllabification takes as its domain the root and the suffixes (either derivational or inflectional) but never covers two separate lexical words.

For example, lexically derived nouns such as *wus-um* ‘laughter’ show that Coda Neutralization is blocked. The /s/ in (59) is lexically syllabified as the onset of the following syllable, and therefore, Coda Neutralization does not apply.

(59) /wus-um/ ‘laugh-Nml’ → [wusum] vs. *[wudum]

Similarly, Coda Neutralization fails to apply between a verb stem and its affixes, as shown in (60). The /s/ in (60) again is resyllabified as the onset of the following syllable, and thus not neutralized to [d]. This indicates that a verb stem and its tense morpheme also form a lexical word.

(60) /wus-ess-ta/ ‘laugh-Pst-Dcl’ → [wusetta] vs. *[wudetta]

Acknowledging the lexical property of the inflectional morphemes in Korean, Yoon

(1993, 1994) calls them ‘phrasal affixes’. Yoon defines phrasal affixes as bound morphemes which combine syntactically with phrases like clitics, but which appear as an affix on the periphery/head of the constituent they subcategorize syntactically (cf. Sadock 1990, Lapointe 1990, 1991). Therefore, on the surface, they will appear as suffixes on the verbal root. In short, a phrasal affix is a clitic which has lexical properties, which is an anomalous category from a morphological point of view. It seems to me that the phrasal affix analysis is not a real solution to the problem, but only an attempt to give a name to the problem itself: it simply says that a certain bound morpheme is neither a regular affix nor a clitic. Following Cho and Sells (1995), I will assume that verbal inflections in Korean are regular affixes (showing “lexical” properties) and handle the phrasal scope problem, as in coordination, without assuming phrasal heads for those morphemes.

Coordination

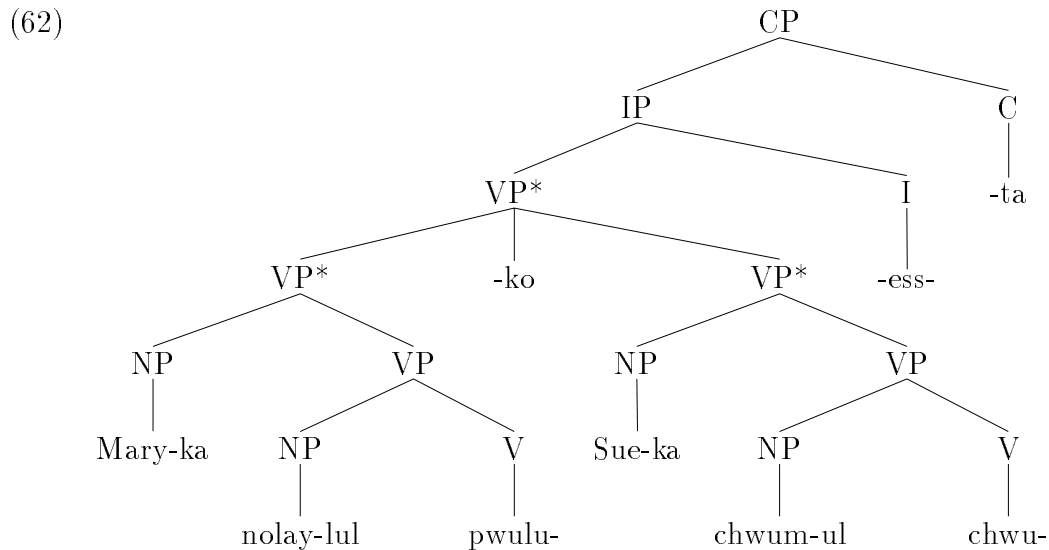
Yoon (1994) presents coordination patterns in Korean as strong arguments that tense and mood are syntactically independent from the verb stem, and hence, that only the uninflected verbal root is inserted as the head of VP. The generalization regarding verbal coordination in Korean (as well as noun phrase coordination, see Cho and Sells (1995)) is that if the verbal inflections are not overtly specified in non-final conjuncts, information from those of the final conjunct is distributed to the non-final conjuncts (Cho and Morgan 1987, Yoon and Yoon 1990, Yoon 1993), whereas if non-final conjuncts are also specified with inflections, there will be no distribution from the final conjunct. For example, in (61), where the verbs in non-final conjuncts uniformly lack tense and mood inflections and only the verbs in the final conjuncts are specified with them, the tense and mood of the final conjuncts, i.e. past and declarative respectively in this case, are distributed to the non-final conjuncts, and

thus are interpreted as having the same tense and mood.²¹

- (61) a. (?)Mary-ka nolay-lul [tut]_V-ko [pwulu]_V-**ess-ta**.
 Mary-Nom song-Acc listen-Conj sing-Pst-Dcl
 ‘Mary listened to and sang a song.’
- b. Mary-ka [nolay-lul pwulu]_{VP}-ko [chwum-ul chwu]_{VP}-**ess-ta**.
 Mary-Nom song-Acc sing-Conj dance-Acc dance-Pst-Dcl
 ‘Mary sang a song and danced a dance.’
- c. [Mary-ka nolay-lul pwulu]_{VP*}-ko [Sue-ka chwum-ul chwu]_{VP*}-**ess-ta**.
 Mary-Nom song-Acc sing-Conj Sue-Nom dance-Acc dance-Pst-Dcl
 ‘Mary sang a song and Sue danced a dance.’

Putting aside the lexical property of the inflectional morphology, a syntactic head analysis could easily capture the phrasal scope of tense and mood in the coordination data. By positing tense and mood as separate syntactic heads, i.e. I and C, whose projections configurationally scope over coordinated Vs, VPs, and VP*s, the distribution of tense and mood would naturally fall out. A phrase structural representation of the VP* coordination in (61c), for instance, is exemplified in (62).

²¹In fact, a sentence with verb coordination does not sound very natural (as marked with (?) in (61a), for example) unless the two (or more) verbs usually go together as if they were a semantic unit, e.g. *mek-ko masi* ‘eat and drink (enjoy, entertain oneself)’, *takk-ko ssul* ‘wipe and sweep (clean)’, etc. (61a) actually tends to be interpreted as ‘Mary listened to a song and sang after it’, and thus sounds much better when *ttala* ‘after’ is inserted before *pwulu* ‘sing’. Therefore, I would rather analyze (61a) as VP coordination where the second object is a null pronoun. However, this distinction is not crucial to the present discussion.



Morphological bonding is usually assumed to be done in the syntax in this type of analysis. Head movement, i.e. verb movement from V to I to C (Whitman 1989 among others), however, is problematic for explaining the coordination data illustrated in (61). If Head (verb) movement is involved in (62), it must take place only in the final conjunct (because the verb in the non-final conjunct is not inflected), which systematically violates the ATB (Across-the-Board) restriction on coordinate structure. The insertion of fully-inflected verbs would not work either with a phrase structure like (62) as in the ‘base-generation’ view (Kroeger 1993, King 1993). If verbs are inserted in their fully inflected form, the verb in the final conjunct in (61c), for instance, could be base-generated in C. Then the conjunct would be asymmetric, i.e. of a VP* and a CP, which violates the general identity constraint on coordination. Yoon (1994) alternatively proposes phrasal affixation, which simply states that the verb stem in the final conjunct combines with the inflectional morphemes in the syntax. However, as mentioned in the previous section, this does not seem to be so much a solution to the problem as a mere restatement of it.

In addition to the tenseless coordination given in (61), tensed coordination is also possible. (63) is the tensed counterpart of (61).²² However, the tensed counterparts in (63) are not exact equivalents of the tenseless sentences in (61). In the former, the tense in each conjunct, even though it is marked with the same morpheme *ess* ‘Past’, is not necessarily considered to refer to the same tense (although the actual events could happen all at the same time), and thus each conjunct is interpreted more as an individual and independent event. On the other hand, in the tenseless coordination, the tense of the final conjunct is “shared” in the sense that the conjoined whole is interpreted as denoting a single unified event (although in fact each event could happen over a long time interval).

(63) a. ?[Mary-ka nolay-lul tul-**ess**]_{IP}-ko [pwulu-**ess**]_{IP}-**ta**.

Mary-Nom song-Acc listen-Pst-Conj sing-Pst-Dcl

‘Mary listened to and sang a song.’

b. [Mary-ka nolay-lul pwulu-**ess**]_{IP}-ko [chwum-ul chwu-**ess**]_{IP}-**ta**.

Mary-Nom song-Acc sing-Pst-Conj dance-Acc dance-Pst-Dcl

‘Mary sang a song and danced a dance.’

c. [Mary-ka nolay-lul pwulu-**ess**]_{IP}-ko [Sue-ka chwum-ul chwu-**ess**]_{IP}-**ta**.

Mary-Nom song-Acc sing-Pst-Conj Sue-Nom dance-Acc dance-Pst-Dcl

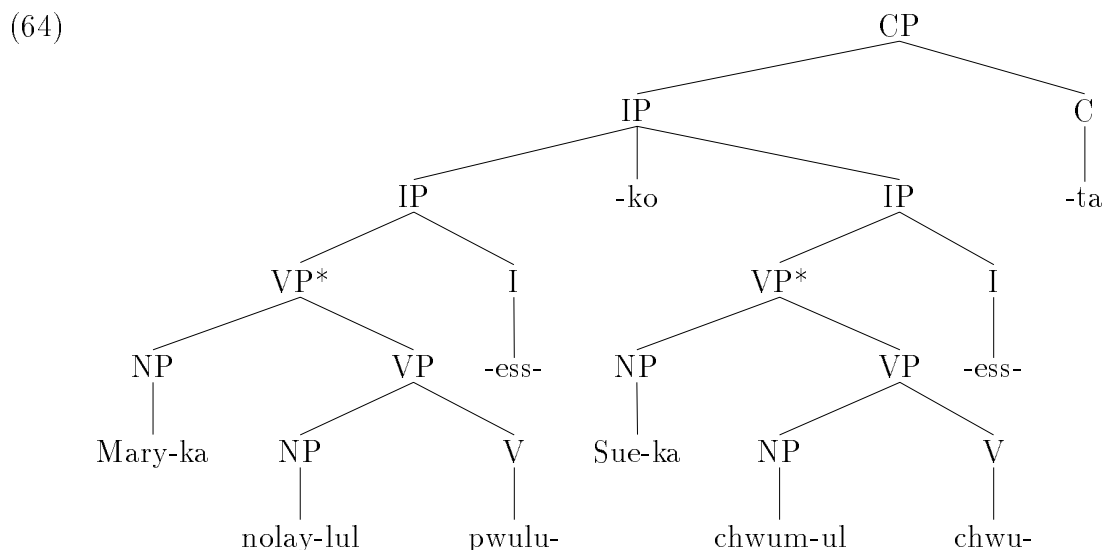
‘Mary sang a song and Sue danced a dance.’

This effect is captured by the phrasal scope in the phrasal head analysis. Yoon argues that when the non-final conjuncts are specified with tense (and mood), the coordination is necessarily ‘clausal’, i.e. of IP (or CP).²³ In a tensed coordination, the

²²As mentioned in the previous footnote, the verb coordination example in (63a) is not very good, and is actually worse than its tenseless counterpart. This may be because when the verbs are tensed, it is harder to consider them as a single event.

²³When the verb of a non-final conjunct is inflected down to mood, the conjunction marker *ko* is not allowed. A conjunction adverb *kuliko* ‘and’ is instead used. As a matter of fact, it is problematic

final conjunct is also regarded as an IP even though it is not necessarily accompanied by (all) its arguments as in (63a) or (63b). The missing arguments in the final conjuncts are considered to be *pro*-dropped. This is supported by the fact that the subject of the first conjunct cannot be a non-referential, non-topical NP because a non-topical element would not allow a *pro*-drop for the second subject (McCloskey 1991, King 1993). The phrase structural representation for (63c), for example, would be the following.



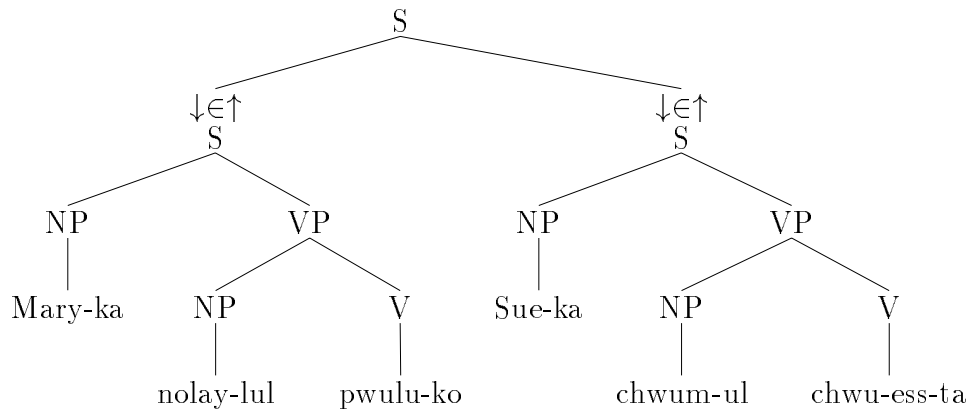
By treating tensed coordination as coordination of two IPs, (64) structurally prohibits the tense of the final conjunct from distributing to the non-final conjunct while it allows the mood to distribute.

Unlike the syntactic head approach, a lexicalist approach as in LFG would not structurally distinguish coordination of tensed clauses from that of untensed clauses. Therefore, it would be a S-coordination in either case, as shown in (65). (65a) is a

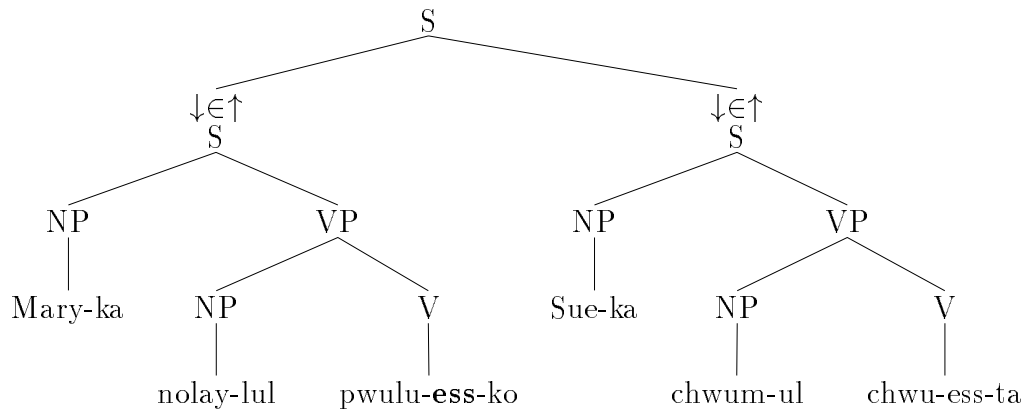
to view two sentences connected by *kuliko* as a case of coordination because the first sentence is punctuated by a period. Rather I consider it as two separate sentences, the second of which starts with a conjunctive adverb.

tenseless coordination structure and (65b) is a tensed one.

(65) a.



b.



Since verbs are inserted in their fully inflected form (abiding by the lexical integrity principle), affixation is not executed in the syntax and therefore, there is no need for functional heads for morphological purposes unless required by other syntactic considerations. Hence, the phrasal scope or distribution of the tense and mood needs to be handled in some other way.

The standard LFG treatment of coordination puts the information from each conjunct as a member of a set in the f-structure (Bresnan et al. 1985, Kaplan and Maxwell 1995); this is carried out by the functional annotation $\downarrow\in\uparrow$ as shown in (66).

(As is the general convention in LFG \uparrow refers to the c-structure mother node and \downarrow to the daughter node.)

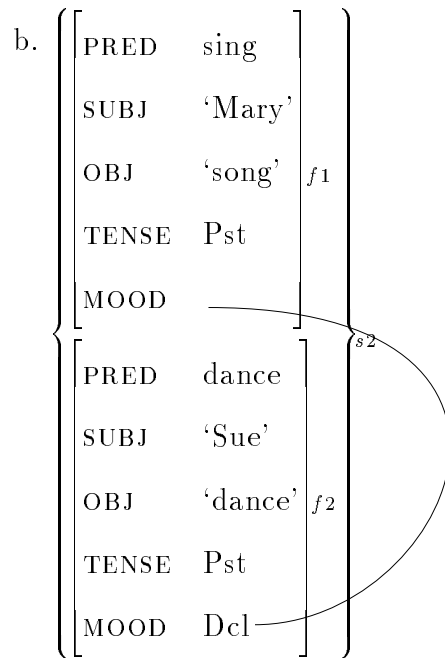
$$(66) \quad S \longrightarrow \quad S \quad (\text{CONJ}) \quad S$$

$$\qquad \qquad \qquad \downarrow \in \uparrow \qquad \qquad \qquad \downarrow \in \uparrow$$

The set representations of the f-structures for examples (65a) and (65b) are shown in (67a) and (67b) respectively.

(67) a.

PRED	sing	f_1
SUBJ	‘Mary’	
OBJ	‘song’	
TENSE	—	
MOOD	—	
s_1		
PRED	dance	f_2
SUBJ	‘Sue’	
OBJ	‘dance’	
TENSE	Pst	
MOOD	Dcl	



Note that although there is no distinction at the constituent structure level between a tensed and an untensed coordination clause, the distinction appears at the functional structure level: whatever value is lacking in the f-structure of the first conjunct is “shared” with that in the f-structure of the second conjunct.

Interestingly, this “sharing” or distribution of values is already built-in in the analysis of coordination in LFG. Kaplan and Maxwell (1995), following Bresnan et al. (1985), extend the function-application device so that it is defined for sets of functions, and treat a set formally as the *generalization* of its functional elements. As originally formulated by Kaplan and Bresnan (1982), the function-application equation $(f\ a) = v$ holds if and only if f denotes an f-structure which yields the value v when applied to the attribute a . For example, in the second f-structure in (67a), $(f\ \text{TENSE}) = \text{Pst}$. The extended definition of function-application says that if s denotes a set of functions, $(s\ a) = v$ holds if and only if v is the *generalization* of all the elements of s applied to a , and the generalization is defined to be the greatest lower bound in the subsumption ordering on the f-structure lattice (see Kaplan and Maxwell (1995:205)

for the definitions of function-application for sets and of generalization). This causes properties attributed externally to a coordinate structure to be uniformly distributed across its elements, without requiring additional grammatical specifications.

So for example, if we assume that every root clause *S* should have TENSE and MOOD, and thus annotate the highest *S* in (65) as (\uparrow TENSE) and (\uparrow MOOD), then the values of these attributes for the whole coordinate structure, e.g. the set s_1 in (67a), will be determined by the generalization of the values of TENSE and MOOD of the element f-structures, e.g. f_1 and f_2 in (67a). By the definition of generalization, the values for TENSE and MOOD in the coordinate *S* are ‘Pst’ and ‘Dcl’ respectively. Also, if the values of these attributes are specified differently in each f-structure, the generalization will not yield any common values, hence no distribution. Therefore, the distribution or sharing effect of the nonspecified values and also the non-distribution of the specified values are both captured in this analysis.

We have just seen that the distribution effect in coordinate structures can be dealt with in a non-structural way. Thus coordination does not really constitute evidence for the phrasal head analysis of the inflectional morphemes in Korean.²⁴ Moreover, given the morpho-phonological evidence which shows that the inflectional morphemes should be processed in the lexicon, it seems undesirable to posit functional projections such as IP and CP or TP and MP in Korean. Therefore, concluding from the discussion in section 2.3, the clause structure in Korean is uniformly *S* both in matrix and embedded clauses, and it has a configurational VP structure as argued earlier. Although I have not provided detailed discussion of canonical ordering constraints for Korean, the discussion for German order given in section 2.2 also applies to Korean in that CANON yields the default order of [Subject—Indirect

²⁴Yoon (1994) presents more coordination-related phenomena including negative polarity licensing, scope of negation, and scrambling as evidence for the phrasal head analysis. However, Choi (1996) shows that those phenomena can be explained without assuming such phrase structural differences (see Choi (1996) and also Kim (1996) for detailed arguments).

Object–Direct Object]. There is in fact a difference between German and Korean in their ranking of the subconstraints of CANON. I will discuss this in chapter 4 and chapter 5.

2.4 Summary

In this chapter, I have examined the basic clause structures in German and Korean and concluded that both have a configurational S structure, i.e. [_S Subject [_{VP}...I.Object D.Object...V]]. This is proposed as the ‘canonical’ structure, which is solely determined by “grammatical” information. The canonical structure is a result of the mapping between the “grammatical” information (in a- and f-structure) and the phrase structural realization (in c-structure), which is controlled by a set of OT constraints called CANON.

Positing a configurational canonical structure in relatively free word order languages requires one to give an explanation for the range of alternative word orders because the canonical structure only gives a subset of the surface word orders. In other words, if the CANON constraints were all and only the constraints involved in phrase structural descriptions and word order, scrambling would never occur, because CANON would always make the canonically-ordered sentence win over non-canonical sentences. However, this is not the case, of course. In chapter 3, I will develop a set of ‘information structuring’ constraints, which I argue to be the main motivation for alternative orders or scrambling.

Chapter 3

Specificity, Focus, and Information Structure

Having established the canonical structures in German and Korean in chapter 2, I will investigate the “free” ordering or scrambling phenomena in this chapter. Despite the fact that these languages are frequently called “free” word order languages, word order is hardly really ‘free’. That is, each alternative structure denotes a slightly different interpretation, and thus alternative orders are not in free variation in a strict sense. Taking the interpretational differences as a clue to the ordering variation in these languages, I identify constraints which prompt this variation in constituent order.

I will first review the meaning-related effects of the alternative orders in section 3.1. I classify them into two distinct categories, semantic (specificity effect) and discourse (anti-focus effect), and point out that these two effects are not unrelated, which is demonstrated in the contrastive focus effect. In section 3.2, I propose a model of information structure (cf. Vallduví 1992, 1993) and show how it can capture the discourse-related facts described in section 3.1. Based on the newly-established

feature-based information structure, in section 3.3, two information structuring constraints are developed, which I argue are responsible for the interpretational effects of scrambling described in the earlier sections. Finally, in section 3.4, I argue that the specificity effect can also be subsumed under the general information-based approach.

3.1 Semantic and Discourse Effects of Scrambling

It has been observed that there are certain semantic or discourse-related effects associated with scrambling. These effects can largely be summarized by the following two generalizations. One is that a definite or specific NP can scramble while an indefinite or nonspecific NP cannot (Mahajan 1990, Moltmann 1990, Diesing 1994, de Hoop 1992). The other is that a nonfocal or topical NP can scramble whereas a focal NP cannot (Lenerz 1977, Abraham 1986, Moltmann 1990, Webelhuth 1992). I will call the former the ‘specificity’ effect and the latter the ‘anti-focus’ effect. However, these generalizations are challenged by a third effect, i.e. the ‘contrastive focus’ effect (Lenerz 1977, Abraham 1986, Moltmann 1990), which contradicts both of the generalizations, because in this case a nonspecific focal NP can scramble. In this section, I discuss these interpretation-related effects in scrambling and review the previous analyses of these phenomena.¹

3.1.1 Specificity Effect

Some sort of ‘definiteness’ effect is frequently reported to be associated with scrambling, opposite to what holds for the *there*-construction in English (Milsark 1977). That is, a scrambled element should be definite or specific and thus a nonspecific or

¹In this chapter, I mainly discuss German data to keep the arguments consistently presented. Although not explicitly brought in, the Korean facts can be considered parallel, especially when the arguments are regularly case-marked. The special *nun*-marking case is discussed in chapter 5.

indefinite NP cannot be in a scrambled position (Mahajan 1990, Moltmann 1990, Webelhuth 1992, Abraham 1986).

This contrast is illustrated in the distinction in German between (1b) and (2b) (Webelhuth 1992:197–198).

- (1) a. weil er wohl **das Buch** gelesen hat
 because he probably the book read has
 ‘because he has probably read the book’
- b. weil er **das Buch** wohl gelesen hat
 because he the book probably read has
 ‘because he has probably read the book’
- (2) a. weil er wohl **ein Buch** gelesen hat
 because he probably a book read has
 ‘because he has probably read a book’
- b. *weil er **ein Buch** wohl gelesen hat
 because he a book probably read has
 ‘because he has probably read a book’

A definite object NP, e.g. *das Buch* ‘the book’ in (1a), which in the default order follows the adverb *wohl* ‘probably’ and precedes the verb (in embedded clauses), can scramble over the adverb *wohl*, as in (1b). In contrast, an indefinite object NP, *ein Buch* ‘a book’, cannot scramble over the same adverb *wohl*, as illustrated in (2b).

Similarly, a definite direct object can scramble over an indirect object while an indefinite direct object cannot, as illustrated in the following (Abraham 1986:18) (see chapter 2 for discussion of the canonical order between two objects).

- (3) a. Ich habe meinem Bruder **den Brief** geschickt.
 I have my brother(Dat) the letter(Acc) sent
 ‘I sent my brother the letter.’
- b. Ich habe **den Brief** meinem Bruder geschickt.
 I have the letter(Acc) my brother(Dat) sent
 ‘I sent the letter to my brother.’
- (4) a. Ich habe meinem Bruder **einen Brief** geschickt.
 I have my brother(Dat) a letter(Acc) sent
 ‘I sent my brother a letter.’
- b. *Ich habe **einen Brief** meinem Bruder geschickt.
 I have a letter(Acc) my brother(Dat) sent
 ‘I sent a letter to my brother.’

In (3), the definite direct object NP, *den Brief* ‘the letter’, can be in a scrambled position to the left of the indirect object NP *meinem Bruder* ‘my brother’, as shown in (3b). On the other hand, the nonspecific indefinite NP, *ein Brief* ‘a letter’, cannot be in that alternative position, as shown in (4b).

It has also been noted, however, that it is not only definite NPs which can scramble, but also indefinite NPs under certain special interpretations: these special interpretations include specific/referential, partitive, and generic readings (de Hoop 1992, Diesing 1994, Moltmann 1990). Therefore, the distinction lies in a semantic difference rather than in a morphological contrast. Consider the following Dutch examples (de Hoop 1992:50).

- (5) a. dat de politie **een kraker** gisteren opgepakt heeft
 that the police a squatter yesterday arrested has
 [referential reading]

- b. dat de politie **twee krakers** gisteren opgepakt heeft
 that the police two squatters yesterday arrested has
 [partitive reading]
- c. dat de politie **krakers** altijd oppakt
 that the police squatters always arrests
 [generic reading]
- d. dat de politie **tien krakers** altijd oppakt
 that the police ten squatters always arrests
 [generic collective reading]

In (5a), the indefinite NP *een kraker* ‘a squatter’ scrambles over the adverb *gisteren* ‘yesterday’ and in this case, it can only receive a specific/referential reading and cannot receive an existential reading, which is possible in the canonical position. In (5b) also, the scrambled cardinal indefinite NP *twee kraker* ‘two squatters’ has a partitive reading, which is roughly equivalent to ‘two of the squatters’, and again the regular existential cardinal reading is absent here. Finally, the scrambled indefinite NPs in (6c) and (6d) have generic readings, in which the object *krakers* is interpreted as something like ‘squatters in general’. This reading is not possible in the original position.

Also in connection with similar generalizations regarding the interpretations of indefinite subjects in certain syntactic positions, e.g. in a VP-internal subject position, de Hoop (1992) and Diesing (1992) generalize these specific/referential, partitive, and generic readings as ‘strong’ and ‘presuppositional’ respectively. For example, in German, an indefinite subject receives a strong or presuppositional reading when it is positioned before a particle such as *ja doch*, but it has a weak or existential reading when it is positioned after the particle (Diesing 1992:36). Also, in Dutch, a similar meaning difference arises between a subject in an *er*-construction and that in the

regular subject position (Reuland 1988:387). This is demonstrated in (6) and (7) respectively.

- (6) a. weil ja doch **Linguisten** Kammermusik spielen
 since PRT linguists chamber music play
 ‘since there are linguists playing chamber music’
- b. weil **Linguisten** ja doch Kammermusik spielen
 since linguists PRT chamber music play
 ‘since (in general) linguists play chamber music’
- (7) a. Fred denkt dat er **twee koeien** op het dak liggen.
 Fred thinks that there two cows on the roof lie
 ‘Fred thinks that there are two cows lying on the roof.’
- b. Fred denkt dat **twee koeien** op het dak liggen.
 Fred thinks that two cows on the roof lie
 ‘Fred thinks that two (specific) cows are lying on the roof.’

The subject *Linguisten* ‘linguists’ in (6a), which is located after the particle *ja doch*, receives an existential reading, while the subject located before the particle in (6b) receives a generic reading, i.e. a strong reading. Similarly, the cardinal subject *twee koeien* ‘two cows’ in (7a), which is positioned after *er* ‘there’, has an existential reading, whereas that in (7b), which is in the clause-initial position, receives a specific or partitive reading.

De Hoop (1992) argues that the distinction of strong versus weak interpretation comes from an (abstract) structural Case distinction.² She argues that an object is interpreted as ‘strong’, or as a generalized quantifier (of type $\langle\langle e, t \rangle, t \rangle$) if and only

²Although it seems fairly plausible to argue that this semantic distinction may follow from the

if it bears strong Case; otherwise, it receives a ‘weak’ reading, which is a ‘predicate modifier’ type reading (of type $\langle\langle e, t \rangle, \langle e, t \rangle\rangle$). According to her, strong Case is a structural Case licensed at S-structure, while weak Case is a default Case licensed at D-structure. Therefore, an indefinite NP which receives its Case (strong Case) at S-structure, such as a scrambled NP, receives a strong reading, while an indefinite NP which has case (weak Case) at D-structure, e.g. in default position, receives a weak reading.

Diesing (1992), on the other hand, explains this semantic distinction, i.e. presuppositional versus existential, by arguing that the VP, which is demarcated by *ja doch*, for instance, in (6), is a boundary for ‘existential closure’ and that an NP inside VP is mapped to the ‘nuclear scope’ while an NP outside VP is mapped to the ‘restrictive clause’. This is summarized by the *Mapping Hypothesis* as follows (Diesing 1992:10):

- (8) a. Material from VP is mapped into the Nuclear Scope.
 b. Material from IP is mapped into a Restrictive Clause.

By virtue of being external to VP, an indefinite NP is semantically mapped into the restrictive clause and thereby receives a presuppositional reading. On the other hand, an indefinite NP which is internal to VP is mapped to the nuclear scope and bound within the VP by an existential operator, thus receiving an existential reading.

Further pursuing this line of a direct syntax-semantics mapping approach, Diesing (1994:5) argues that scrambling or object shift (Holmberg 1986, Vikner 1990) is “an instance of semantically-driven movement, a result of interpretation conditions applying in the syntax-semantics mapping which induce movement.” Following Heim

morphological case distinction in languages such as Turkish (nominative (default case) versus accusative) (Enç 1991) and Finnish (partitive versus accusative), it becomes much more abstract in languages such as Dutch, German, and Korean, where no overt case distinction exists between ‘weak’ and ‘strong’ NPs. Even the distinction based on abstract Case marking does not seem highly plausible in German and Korean because scrambling in these languages is not limited to a single position. It is not very desirable to say that there is more than one ‘strong’-Case position, and even if so, variation between two strong-Case positions is hard to explain.

(1982), Diesing (1994:12–13) assumes that definites, like indefinites, introduce variables, but that these are “familiar” entities, and thus incompatible with existential binding, which requires “novel” variables. Therefore, definite objects cannot be bound by the existential closure, and thus must move out of the VP.³

In short, both de Hoop (1992) and Diesing (1992, 1994) assume that the semantic distinction comes from a syntactic distinction, whether it is Case or a certain phrase structural scope (e.g. VP). Namely, they argue that there is a one-to-one mapping between syntax and semantics. From this perspective, scrambling is viewed as a syntactic mechanism to encode a certain type of semantic meaning of NPs, i.e. strong, presuppositional, or specific meaning.

However, this raises an immediate question with regard to the optionality of scrambling of definite NPs. As we have seen above in (3), which is repeated here as (9), a definite NP may or may not scramble.

- (9) a. Ich habe meinem Bruder **den Brief** geschickt.
 I have my brother(Dat) the letter(Acc) sent
 ‘I sent my brother the letter.’
- b. Ich habe **den Brief** meinem Bruder geschickt.
 I have the letter(Acc) my brother(Dat) sent
 ‘I sent the letter to my brother.’

According to Diesing (1994), a definite NP must move out of VP to avoid existential closure because it is a “familiar” entity. In other words, it must necessarily scramble. However, it can stay in the canonical position as shown in (9a). Moreover, there

³Diesing argues that the ‘existential closure condition’ can be regarded as part of a general requirement that the relative scope of NPs, i.e. the “Scope Condition”, be syntactically determined, e.g. by the c-command relation (cf. Moltmann 1990). However, although some examples, especially those which involve scope-affecting adverbs or negations, can be explained by the direct syntax-semantics mapping, examples like (3) are harder to explain with scope interactions. See Vallduví (1992) for an example of a discourse explanation of scope phenomena.

is no distinct semantic difference in ‘strongness’ or ‘presuppositionality’ between the in-situ definite NP in (9a) and the scrambled one in (9b). The definite NP *den Brief* ‘the letter’ denotes a specific referential, thus ‘strong’ and ‘presuppositional’, entity, regardless of its relative position in the sentence.

It is also true, however, that the definite NP *den Brief* encodes a slightly different reading depending on the position (although it is not a difference in specificity): the scrambled NP in (9b) receives more of a ‘topic’-like interpretation whereas the one in (9a) receives more of a ‘focus’-like interpretation. Interestingly, Diesing (1994:12–13) also notes the topic/focus difference in interpretation, and argues that the “familiar” status of definite NPs can be overridden by ‘focus’, which “signal[s] novel information is being, or about to be, presented”, and in this case, definite NPs can remain in situ. This fact indicates that the scramblability of a phrase is fairly strongly affected by discourse factors such as topic and focus.

Similarly, this discourse influence is also exhibited with indefinite NPs too. Contrary to our initial observation that indefinite NPs, especially nonspecific, weak, or existential NPs, cannot scramble, an indefinite NP can actually be out of its canonical position when it is contrastively focused, and moreover, in that case, it can maintain its existential reading (Moltmann 1990:15–16). We will discuss this issue in more detail in section 3.1.3.

Therefore, it can be concluded that the semantic distinction of specificity alone cannot explain all aspects of scramblability of a phrase, but rather discourse properties such as topicality and focality should be taken into account. As a matter of fact, the topic/focus effect of scrambling has been frequently noted in the literature, which will be discussed in the sections to follow.

3.1.2 Anti-focus Effect

Scrambling also exhibits what I call the ‘anti-focus’ effect (Lenerz 1977, Abraham 1986, Webelhuth 1992, Moltmann 1990), which can be roughly summarized as “the scrambled element must necessarily be unfocused” (Webelhuth 1992:194). As Lenerz (1977) points out, the data below in (10) and (11) demonstrate an asymmetry in focality of constituents between the default order sentence and ones with a scrambled order. That is, in the default order, no focus constraint holds, i.e., any element of a sentence, argument or adjunct, can be focused. On the other hand, in a scrambled order, a focus constraint prevents a scrambled phrase from being focused. Here, focus can be interpreted as ‘new’ information: it is used to refer to an element which corresponds to a *wh*-phrase in the previous question. (This element usually receives prosodic prominence as well. For this reason, in all the following examples, a focused element, even if not contrastive, will be represented in upper case.)

A discourse context which easily offers a focus construction is a question and answer pair. In most cases, the focus or the new information of a sentence is the part which corresponds to the question phrase. Let us first look at the question and answer pairs in (10) and (11) (Lenerz 1977:20–21).

(10) a. Wann hast du das Buch gelesen?

when have you the book read

‘When did you read the book?’

b. Ich habe GESTERN das Buch gelesen.

I have yesterday the book read

‘I read the book yesterday.’

b’. Ich habe das Buch GESTERN gelesen.

I have the book yesterday read

‘I read the book yesterday.’

- (11) a. Was hast du gestern gelesen?
 what have you yesterday read
 ‘What did you read yesterday?’
- b. Ich habe gestern das BUCH gelesen.
 I have yesterday the book read
 ‘I read the book yesterday.’
- b’. *Ich habe das BUCH gestern gelesen.
 I have the book yesterday read
 ‘I read the book yesterday.’

In (10), since the question is about *wann* ‘when’ the book-reading event happened, the time adverb phrase *gestern* ‘yesterday’ will be the focus in the following answers (10b) and (10b’). On the other hand, in (11) the question is about *was* ‘what’ was read in the reading event of yesterday, *das Buch* ‘the book’ will be the focus in the following answers (11b) and (11b’). In both (10) and (11), the (b) sentences are in the canonical order, and the (b’) sentences are in a scrambled order, in which the object scrambles over the adverb.

As Lenerz (1977) points out, in the default order, either the adverb *gestern* ‘yesterday’ in (10b) or the object *das Buch* ‘the book’ in (11b) can be focused. In other words, no focus constraint applies in a default ordered sentence. In contrast, however, a focus constraint holds in scrambled sentences. That is, while the in-situ adverb *gestern* in (10b’) can be focused, the scrambled object *das Buch* in (11b’) cannot be focused. To put it in other words, the nonfocused object phrase *das Buch* in (10) can scramble as shown in (10b’). However, if it is focused as in (11), the object phrase cannot scramble over the adverb as shown in (11b’).

A ditransitive construction shows a similar effect (Lenerz 1977:43) as demonstrated in (12) and (13). In (12), the indirect NP *dem Kassierer* ‘the cashier’ is the

focus because the question solicits the information about *wem* ‘(to) whom’ I gave the money. Therefore, the nonfocused direct object NP *das Geld* ‘the money’ can scramble as in (12b’).

- (12) a. Wem hast du das Geld gegeben?
 whom have you the money given
 ‘Who did you give the money?’
- b. Ich habe dem KASSIERER das Geld gegeben.
 I have the cashier the money given
 ‘I gave the cashier the money.’
- b’. Ich habe das Geld dem KASSIERER gegeben.
 I have the money the cashier given
 ‘I have the money to the cashier.’

In (13), on the other hand, the direct object NP *das Geld* is the focus of the sentence because the question is about *was* ‘what’ I gave to the cashier. Thus, in this case, the direct object *das Geld*, which is now focused, cannot scramble, as illustrated in (13b’).

- (13) a. Was hast du dem Kassierer gegeben?
 what have you the cashier given
 ‘What did you give the cashier?’
- b. Ich habe dem Kassierer das GELD gegeben.
 I have the cashier the money given
 ‘I gave the cashier the money.’
- b’. ?*Ich habe das GELD dem Kassierer gegeben.
 I have the money the cashier given
 ‘I gave the money to the cashier.’

To put it in terms of the focus constraint, in the default order, as in (12b) and (13b), either the indirect object *dem Kassierer* ‘the cashier’ or the direct object *das Geld* ‘the money’ can be focused, whereas in scrambled sentences, such as in (12b’) and (13b’), only the nonscrambled phrase *dem Kassierer* can be focused.

We can summarize the discussion here that a scrambled phrase should be defocused and may not be interpreted as new information. However, this generalization is undermined by the contrastive focus effect which will be discussed in the next section. Putting the contrastive focus effect aside for the moment, we are left with two separate generalizations regarding the semantic or discourse effects of scrambling. To recapitulate, the first is that a scrambled phrase should be ‘specific’ (definite or indefinite), and the second is that a scrambled phrase should be ‘defocused’ or ‘topical’. How can we reconcile these two generalizations? Interestingly, there have been attempts to unify these two apparently distinct effects, which we will see in what follows.

First, Webelhuth (1992) explains the specificity effect from the focus-oriented perspective. He argues that it can be assumed that “an unspecific indefinite phrase is inherently focused” (Webelhuth 1992:197). If we understand that focus here is new information as we have assumed before, then his remark can be rephrased as ‘an unspecific indefinite phrase is inherently new information.’ This idea is in fact fairly intuitive in the sense that an unspecific indefinite phrase is normally not referential, and is hence interpreted as unfamiliar or unidentifiable in discourse, therefore being interpreted as ‘new’ (cf. Heim 1982, Enç 1991). A nonspecific NP normally has a function of introducing a new entity in the discourse. Once we assume that, the specificity effect can be automatically captured by means of the anti-focus constraint, i.e. a scrambled phrase should be unfocused or defocused.

- (14) a. weil er wohl ein Buch gelesen hat
 because he probably a book read has
 ‘because he has probably read a book’
- b. *weil er ein Buch wohl gelesen hat
 because he a book probably read has
 ‘because he has probably read a book’

In (14), for example, which is repeated from section 3.1.1, the scrambled sentence (14b) is ungrammatical because the scrambled indefinite NP *ein Buch* ‘a book’ is (inherently) focused by being indefinite, thus violating the anti-focus constraint on scrambled elements.

Diesing (1992:49–53), on the other hand, proposes to unify the effects from the other perspective: she tries to derive the focus effect from her tree-splitting mapping hypothesis. She notes the following phenomenon in individual predicate sentences: focusing the subject leads to favoring the existential reading, as in (15a), while focusing the adjective leads to the generic reading, as in (15b).

- (15) a. FIREMEN are available.
 b. Firemen are AVAILABLE.

The interpretive preferences in (15) are explained by her semantic partition in that the focus part of the sentence corresponds to the nuclear scope of the logical representation, and the unfocused portion corresponds to the restrictive clause. To push for direct semantic-syntactic structure mapping by means of tree-splitting in the syntax, she further claims that focusing the subject causes the subject to lower into the [Spec,VP] at LF.

Whatever the mechanical details of each proposal may be, an important thing to note is that they share the following points: both proposals agree that the focus

interpretation and the existential reading belong to one group, and the nonfocal or topical interpretation and the specific/strong/presuppositional reading belong to another group; furthermore, they also agree that the former type of NP cannot scramble whereas the latter can. However, this generalization is not necessarily correct. As will be discussed in the next section, there are counterexamples which contradict these generalizations. That is, certain *focused* phrases can also scramble. I call this phenomenon the ‘contrastive focus’ effect.

3.1.3 Contrastive Focus Effect

Moltmann (1990:15–16) provides the following interesting examples which indicate that focused phrases, especially contrastively focused phrases, can scramble or be positioned out of their default place. Moreover, she argues that when contrastively focused indefinite NPs scramble, they can retain their existential or weak readings. We will call this the ‘contrastive focus’ effect. This is illustrated in (16).⁴

- (16) a. weil Hans ein BUCH dem Mann gegeben hat (nicht eine ZEITUNG)
 because Hans a book(Acc) the man(Dat) given has not a newspaper
 ‘because Hans gave a book to the man, (not a newspaper)’
- b. weil Hans BÜCHER dem Mann gegeben hat (nicht ZIGARETTEN)
 because Hans books(Acc) the man(Dat) given has not cigarettes(Acc)
 ‘because Hans gave books to the man, (not cigarettes)’

In (16a), the scrambled NP *ein Buch* ‘a book’ is focused, i.e. having a high pitch accent and being interpreted as new information (note that contrastively focused elements are also represented in upper case). Unlike the regular focus case, however, the focused

⁴It seems that speakers vary in accepting the sentences in (16). I will discuss this issue in the next chapter.

phrase *ein Buch* is compared with another phrase, i.e. *eine Zeitung* ‘a newspaper’, and thus receives a contrastive interpretation. Moreover, unlike the unfocused scrambled phrases discussed in section 3.1.1, the focused indefinite NP *ein Buch* in (16a) need not be interpreted as specific, i.e. a certain specific book the speaker has in mind. Likewise, in (16b), the scrambled NP *Bücher* ‘books’ is focused and contrasted with *Zigaretten* ‘cigarettes’, and here again *Bücher* ‘books’ does not have to be specific, partitive, or generic.

Moltmann (1990:15) further notes that adverbs such as *nur* ‘only’ or *sogar* ‘even’, which have been noted as associated with focus (Jackendoff 1972, Rooth 1985, 1992), allow indefinite NPs to scramble and also to be interpreted nonspecifically. This is illustrated in (17).

- (17) a. weil Hans NUR ein BUCH dem Mann gegeben hat
 because Hans only a book(Acc) the man(Dat) given has
 ‘because Hans only gave a book to the man’
- b. weil Hans SOGAR ein BUCH dem Mann gegeben hat
 because Hans even a book(Acc) the man(Dat) given has
 ‘because Hans even gave a book to the man’

Here again, *ein Buch* ‘a book’ is interpreted as a nonspecific, random book, not as a specific book. Why do the phrases modified by such adverbs as ‘only’ or ‘even’ pattern together with contrastively focused phrases? Interestingly, Dik et al. (1981) treat this ‘association with focus’ case also as contrastive focus. This will be discussed in more detail in next section.

Abraham (1986:32) notes a similar focus effect. He argues that “[i]f a [–def]-element goes before a [+def]-element, it has to carry focal stress”. He provides the generalizations in (18) regarding the definiteness and focality of scrambled elements (Abraham 1986:33). Like many others, Abraham does not distinguish contrastive

focus from “normal” focus, thus defining his [+F] as denoting “carrying normal or contrastive sentential accent/pitch”, and his [−F] as denoting “the topic in its usual meaning” (Abraham 1986:17).

- (18) a. IO[+def,−F] + DO[−def,+F]
 b. IO[+def,+F] + DO[−def,−F]
 c. DO[−**def**,+**F**] + IO[+def,−F]
 d. *DO[−def,−F] + IO[+def,+F]

As also pointed out by others, the default order sentences as illustrated in (18a) and (18b), do not show any focus constraint: both IO and DO can be either [−F] or [+F]. However, scrambled sentences, where the direct object precedes the indirect object, as in (18c) and (18d), for instance, are subject to a focus constraint.⁵ That is, an indefinite phrase should be focused when it is scrambled, as shown in (18c). Otherwise, the scrambling is not possible, as shown in (18d). In other words, (18c) describes exactly the cases as in (16), where contrastively focused indefinites are able to scramble.

This contrastive focus effect or constraint is in fact a serious problem for the previous two generalizations. Simply, this new contrastive focus effect contradicts both the specificity and the anti-focus effects. The specificity constraint requires that nonspecific indefinite phrases not scramble, but the examples in (16) and (17) indicate that they can. On the other hand, the anti-focus constraint requires that focused phrases should not scramble, but (16) and (17) again show that they can.

We can see this contradiction in some of Abraham’s (1986) constraints too. Earlier in his presentation, he proposed the constraints on scrambling demonstrated in (19a)

⁵Abraham (1986) puts a ? for (18c). This slight marginality seems to be due to the fact that the scrambling of indefinite NPs requires a more complex context than the normal scrambling case, i.e. a contrastive focus context. What matters in the current discussion is the distinction between (18c) and (18d), and it is very clearly represented there.

and (19b) (Abraham 1986:17).

- (19) a. *DO[−def] + IO[+/-def]
 b. *DO[+F] + IO[−F]

(19a) is equivalent to the specificity constraint which is discussed in section 3.1.1 and (19b) is parallel to the anti-focus constraint discussed in section 3.1.2. However, both of these constraints contradict another constraint of his, which we have just seen in (18c). Ironically, the combination of the negative constraints (19a) and (19b) turns out to be a positive constraint, i.e. (18c).

These new facts regarding the contrastive focus effect of scrambling lead us to conclude that neither the specificity constraint or the anti-focus constraint is the correct generalization to describe the semantic or discourse effect associated with scrambling. Furthermore, the existence of a third constraint, i.e. the contrastive focus effect, which requires information both about the specificity and focality of a scrambled element, shows that the above two effects should not be treated separately: specificity and focality seem to affect each other. Also, the contrastive focus effect further demands that we should more closely examine discourse notions such as focus, topic, and contrastive focus, because these certainly seem to be crucial factors which determine the scramblability of phrases. We will investigate this problem in the next section.

3.2 Information Structure

A sentence can be internally analyzed in several different ways according to which aspect of it is under discussion. Just as a sentence can be structured in terms of its elements' categorial features and constituency, or in terms of its components'

semantic properties, it can also be structured in terms of its constituents' discourse-contextual functions. At this discourse-pragmatic dimension, a sentence can be partitioned into topic and comment (Gundel 1974, Dahl 1974, Kuno 1980, Reinhart 1982), presupposition/background and focus (Chomsky 1971, Jackendoff 1972, Dahl 1974, Rochemont 1986, Prince 1981, Ward 1988, Lambrecht 1994), or theme and rheme (Firbas 1966, Halliday 1967). I will call the partition of this sort 'information structure', following Halliday (1967), Vallduví (1992), and Lambrecht (1994).

The information structure of a sentence is, roughly speaking, a reflection of discourse-contextual information in that sentence. Depending on how it relates to the discourse, a sentence can have various information structural descriptions. Vallduví (1992), along with Lambrecht (1994), has established information structure as an independent component of grammar. As a separate level of linguistic representation, information structure interacts with other components of grammar such as syntax, semantics, and prosody.

As we have seen in the previous section, information structural notions such as topic and focus play a crucial role in scrambling. Even the semantic effect of specificity seems to be overridden by some informational phenomena, e.g. contrastive focus as demonstrated in 3.1.3. In this section, we will explore what information structure is, and how it relates to scrambling.

3.2.1 Information Packaging

Vallduví (1992:8–9) takes information structure or INFORMATION PACKAGING to be a subdomain of pragmatics which deals with problems such as illocution, discourse structure, reference resolution, implicature, and empathy. He argues that the successful interpretation of a sentence requires not only the interpretation of the truth-conditional meaning or the semantic meaning in its narrow sense, but also the interpretation of the informational meaning. According to him, the latter is encoded by

information packaging. Information packaging reflects “the speaker’s beliefs about how th[e] information fits the hearer’s knowledge-store” (Vallduví 1992:10). In other words, it not only indicates what part of the sentence constitutes information, but also instructs where and how that information should be stored.

Vallduví’s (1992, 1993) information structure consists of three primitives, i.e. FOCUS, LINK, and TAIL, which encode the information status of each element of the sentence. He first partitions a sentence into two parts, i.e. FOCUS and GROUND. Ground is the part that anchors the sentence to the previous discourse or the hearer’s ‘mental world’, whereas focus is the ‘informative’ part that makes some contribution to the discourse or the hearer’s ‘mental world’. This distinction is parallel to the binary partition of given-new or topic-focus in the literature. Then he further divides ground into link and tail. This subdivision of background information is crucial in Vallduví (1992:ch. 5) to his account of word order in Catalan: according to him, link elements are left-detached and tail elements are right-detached in Catalan.

$$(20) S = \{\text{focus, ground}\}$$

$$\text{ground} = \{\text{link, tail}\}$$

Since for Vallduví the role of information packaging is to optimize the entry of information into the hearer’s knowledge store, his primitives are defined towards that goal. So, for example, the link indicates *where* the informative part of the sentence, i.e. focus, should go within the hearer’s knowledge-store, i.e. “a locus of information entry” and the tail indicates *how* it fits there. Using the Heimian file card analogy, he compares the hearer’s knowledge-store to a pile of file cards, and information packaging to updating those file cards. The focus is the information which the speaker wants the hearer to update his file cards with. The link instructs the hearer as to which card he should keep the record of the information on, and the tail further specifies where exactly in that file card pointed to by the link, the hearer should keep

the record, and it also indicates whether the information should simply be added or replaced. In more traditional terms, however, we can interpret link as topic (Gundel 1974, Reinhart 1982) or theme (Firbas 1966, Halliday 1967, Kuno 1972), which is roughly speaking what the sentence is ‘about’, and tail as the rest of the ground or the given information which is somewhat inconspicuous in the sentence.

Let us look at the examples in (21) and (22) (Vallduví 1993:7). Both (21b) and (22b) more or less carry the same truth-conditional meaning. They mean that there was a giving event at some past point of time where the giver is Mary, the given is a shirt, and the recipient is Harry. This is briefly illustrated in (23). However, sentence (21b) and sentence (22b) carry information of two distinct sorts. Although they share the informative part, i.e. the focus of the sentence, they differ in what each sentence is ‘about’. (Focused elements are represented in upper case and topics in small capitals.)

(21) a. What about Mary? What did she give to Harry?

b. MARY_{Link} gave a SHIRT_{Focus} to Harry.

(22) a. What about Harry? What did Mary give to him?

b. TO HARRY_{Link} Mary gave a SHIRT_{Focus}.

(23) give (x,y,z), x=Mary, y=a shirt, z=Harry, Tense=Past

Since both (21b) and (22b) are the answers to the same question, i.e., *What did Mary give to Harry/him?*, it is easy to detect what the focus of the sentence is for both of them: it is the part which corresponds to the question phrase *what*, i.e. *a shirt*. The link of the sentence is signaled by a *what about?* phrase. This phrase has the function of highlighting an element among the given information. In (21), the preceding discourse singles out *Mary* as the element which the answer should pay attention to, and thus *Mary* is the link in (21b). Namely, *Mary* is what the sentence

is talking ‘about’. On the other hand, in (22), *Harry* is singled out as the link, thus (22b) is ‘about’ (*to*) *Harry*. Finally, the tail is the part of the sentence which is neither focus nor link, i.e. inconspicuous old information. Thus, the tail in (21b) is *gave to Harry* and that in (22b) is *Mary gave*.

Now that we have an example of what information structure looks like, let’s return to our original problem, i.e. how the semantic and discourse effects of scrambling can be explained, and see how the idea of information structure can apply to them. Putting the specificity effect aside for the moment (which will be discussed in section 3.4), let us first consider the two focus-related effects. To recall, the first is the anti-focus effect that a nonfocused or topical element can scramble and a focused element cannot scramble. The second, quite contrarily, is that a contrastively focused element can scramble. I will first discuss the anti-focus effect in the next section 3.2.2, and then the contrastive focus problem in the section following that.

3.2.2 Topic and Tail

The anti-focus constraint requires that a focused element cannot scramble while a non-focused or defocused element can. In Vallduví’s (1992) information structure introduced above, the distinction between ‘focus’ and ‘non-focus’ is quite clear. The focused element is the ‘focus’, i.e. new and informative information, and the non-focused or defocused element is the ‘ground’, i.e. old or given information. The ground is further classified into link and tail. Therefore, the anti-focus constraint can be reinterpreted as: while link and tail can scramble, focus cannot. This prediction holds as will be shown below.

In the discussion of the anti-focus effect earlier in this chapter, we have only paid attention to the focus/non-focus distinction, and have not really taken notice of the link/tail distinction. Although it is often the case that ‘non-focusedness’ or defocusedness’ is equated with ‘topicality’ (Abraham 1986, Webelhuth 1989, Moltmann 1990),

caution should be taken about what ‘topicality’ really means. Topic sometimes refers to *any* old information, especially when the binary distinction of topic and focus is the only available classification. On the other hand, topic can refer to a subset of old information, namely, only the salient or prominent part, as in the case of ‘link’ in Vallduví (1992). In what follows, I will use the *what about X?* phrase, following Vallduví (1992, 1993), to identify the link or the topic (in its narrow sense) of the sentence.

Let us first consider the tail case. We can assume that some given old information is the tail when there has been no particular attention paid to it, for instance, when it is not highlighted with a *what about?* phrase or no pitch accent is given to it. Let us look at the question and answer pair in (24), also taken from Lenerz (1977:43).

- (24) a. Wem hast du das Geld gegeben?
 to whom have you the money given
 ‘To whom did you give the money?’
- b. Ich habe dem Kassierer das Geld gegeben.
 I have the cashier the money given
 ‘I gave the cashier the money.’
- b’. Ich habe **das Geld** dem Kassierer gegeben.
 I have the money the cashier given
 ‘I gave the money to the cashier.’

Das Geld ‘the money’ in (24) is a tail: it is non-salient old information. It is not the focus (the focus is *dem Kassierer* here), nor is it the link (there is no link in this context). As a tail, *das Geld* can indeed scramble. In (24b’), it scrambles over the indirect object *dem Kassierer* ‘the cashier’.

What about the link? As expected, a link can also scramble. Consider the example below in (25).

- (25) a. *Wie steht's mit dem Geld? Wem hast du das Geld gegeben?*
 how stands it with the money to whom have you the money given
 'What about the money? To whom did you give the money?'
- b. Ich habe **das Geld** dem Kassierer gegeben.
 I have the money the cashier given
 'I gave the money to the cashier.'

Being in the *wie steht's mit?* phrase, i.e. the German counterpart to *what about?*, *das Geld* 'the money' is presented as the link, i.e. salient or prominent old information. As shown in (25b), this prominent old information is out of its canonical position. Therefore, the anti-focus constraints holds in that the non-focused part of the sentence can scramble: that is, link or tail can scramble.

The next question to ask is if the further distinction of link and tail in the ground elements makes any difference in the scrambling phenomena, that is, if 'prominence' counts in scrambling. Vallduví (1992) argues that in Catalan, link behaves differently from tail in that the former goes to the right side of the sentence while the latter goes to the left side to make room for focus: so the three-way distinction in his information structure works very well there. In scrambling also, link seems to behave differently from tail: here it is the 'degree' of scramblability rather than the 'direction' found in Catalan.

There are two ways link differs from tail. First, link scrambles more often than tail: although tail can stay in the base position, link tends to scramble whenever possible. Notice that in the tail example in (24), both the nonscrambled sentence in (24a) and the scrambled one in (24b) are equally available (Lenerz 1977), whereas in the link example in (25), the nonscrambled sentence is not available as an answer in that context. Second, only link can scramble over the subject. Scrambling over the subject is fairly 'marked' in German, but when it is possible, it is only link, a very

prominently presented element, that can be positioned before the subject. Compare (26) and (27).

(26) a. Wie steht's mit dem Geld? Wem hat Hans das Geld gegeben?
 how stands it with the book to whom has Hans the money given
 'What about the money? To whom did Hans give the money?'

b. Ich glaube daß **das Geld** Hans dem Kassierer gegeben hat.
 I believe that the money Hans the cashier given has
 'I believe that Hans gave the money to the cashier.'

(27) a. Wem hat Hans das Geld gegeben?
 to whom has Hans the money given
 'To whom did Hans give the money?'

b. *Ich glaube daß **das Geld** Hans dem Kassierer gegeben hat.
 I believe that the money Hans the cashier given has
 'I believe that Hans gave the money to the cashier.'

Using the *what about?* phrase again to identify the link of the sentence, in (26), the link *das Geld* can scramble over the subject *Hans*. However, when *das Geld* is interpreted as a tail, as in (27), the scrambled sentence becomes much worse: tail cannot scramble over the subject.

Thus, let me close this section with the following generalization as to the scrambling of the ground elements.

(28) Scrambling of Ground elements:

- a. Ground elements, both link and tail, can scramble.
- b. Link more easily scrambles than tail.

In other words, as the anti-focus constraint predicts, ‘nonfocused’ or ‘old’ elements are allowed to be out of their canonical positions. In addition, it appears that ‘prominent’ elements achieve more freedom in scrambling than ‘nonprominent’ elements.

3.2.3 Contrastive Focus and Completive Focus

Now, let us turn our attention to the ‘focused’ part of the sentence. As mentioned repeatedly, the anti-focus constraint indistinguishably prohibits any focus from scrambling. We have observed that acting against the anti-focus constraint, however, an element that is a contrastive focus can scramble and be out of its canonical position. This seems to indicate that there are in fact two distinct types of focus: one, a kind which prohibits scrambling and the other, one which allows it (Lenerz 1977, Moltmann 1990). I argue in fact that the property which distinguishes these two types of focus is also ‘prominence’. I examine the nature of the two kinds of focus in this section.

The idea that more than one type of focus exists is by no means new. Contrastive focus has been noted as distinguishable from a purely new-information type of focus by several linguists. It has also been pointed out that contrastive focus may not carry really ‘new’ information. Herring (1990:164) distinguishes PRESENTATIONAL FOCUS and CONTRASTIVE FOCUS and argues that “the information status of contrastive focus and presentational focus differs, in that arguments presented for the first time (e.g. as participants in a narrative) are completely new, while contrastively focused arguments are already explicitly or implicitly present in the discourse context.” She takes an entity introduced by the *there*-construction in English as a typical example of presentational focus, and that introduced by an *it*-cleft construction as an example of contrastive focus. Similarly, Rochemont (1986) and Rochemont and Culicover (1990) argue that CONTRASTIVE FOCUS, unlike PRESENTATIONAL FOCUS, does not have to be totally new information. Using the notion of ‘c(ontext)-construability’, which is

defined to be ‘under discussion’ or to ‘have a semantic or discourse antecedent in the discourse’ (Rochemont 1986:47, Rochemont and Culicover 1990:20), they define presentational focus as ‘not c-construable’, but they don’t require such a restriction for contrastive focus. Finally, Dik et al. (1981:42) also differentiate COMPLETEIVE FOCUS and CONTRASTIVE FOCUS, and argue that the latter case often involves some ‘pre-supposed’ alternatives, while the former simply fills in the information gap between the speaker and the addressee.

Contrastive focus, as sketched above, is often characterized as being ‘not entirely new’ although it certainly carries ‘new’ or ‘informative’ information (otherwise, it would not be called a ‘focus’ at all). The main reason that contrastive focus is often cited as *not* being so ‘new’ as presentational or completive focus is that being contrastive, the focused element is compared with or even opposed to something else (this comparison or opposition may be either explicit or implicit, or stated or predicted (Halliday 1967)). Thus, “a set of possible candidates for the role played by the element which is being contrasted” (Chafe 1976:36), or a set of ‘alternatives’ (cf. Rooth’s (1992) C-Set), is created. This set of alternatives, whether already present in the discourse or accommodated at the time of the utterance, contextualizes the information conveyed by the object in focus, hence making it less ‘new’ in a sense.

Consider the following example in (29) (Dik et al. 1981:45). Suppose that a person A asked another person B the following question: *What did John buy?*, and that the examples in (29) are answers to it.

- (29) a. John bought a Toyota.
 b. John bought a TOYOTA!
 c. John bought a TOYOTA, not a VOLKSWAGEN!

Person B can give an answer as in (29a) to the question, simply providing the information that person A lacks at the moment, i.e. that it is *a Toyota* that John

bought. This is a regular new-information focus, i.e. a presentational or completive focus whose major function is to fill in the informational gap between the speaker and the hearer. On the other hand, the answer in (29b) puts the information in contrastive focus by means of a heavy accent on *Toyota* or with some extralinguistic devices such as gestures or facial expressions. Alternatively, contrastive focus can be more explicitly expressed by an accompanying alternative phrase as in (29c). An answer like (29b) or (29c) implies that the information that the speaker is providing is contrary to his/her and/or the hearer's expectation. For example, it can imply that the speaker thought that, knowing his taste, John would buy a Volkswagen, for example, instead of a Toyota, or the speaker thought that John would buy a Volkswagen because he usually likes German cars, and so on. In other words, in the speaker's mind, and also in the hearer's mind as the speaker conceives of it, there is a set of alternatives which includes a Volkswagen as a more plausible candidate. Hence, the existence of (potential) alternatives makes the currently focused item 'prominent' so that the focus (i.e. contrastive focus) gets 'emphasis' and evokes a 'contraexpectation' effect.

Dik et al. (1981) propose several different types of contrastive focus: selecting, restricting, expanding, replacing, and parallel. Not surprisingly, all these subtypes, either explicitly or implicitly, preexistent or accommodated, assume a set of alternatives.⁶ Examples of each type are illustrated as follows.

(30) Selecting:

- a. Did Andrew buy chocolate or flour?
- b. He bought CHOCOLATE.

(31) Restricting:

⁶Dik et al. actually do not consider the 'parallel' focus to have a set of alternatives because it is not presupposed at the time of utterance. However, I believe that the parallel focus also involves a set of alternatives: it is accommodated at the time of utterance if not already presupposed, i.e. the elements in parallel focus immediately form a contrast set.

- a. Since Andrew bought chocolate and flour, he can make a cake.
- b. No, he only bought CHOCOLATE.

(32) Expanding Focus:

- a. Since Andrew bought chocolate, he will be happy.
- b. Yes, but he also bought FLOUR, so he can make a cake.

(33) Replacing Focus:

- a. Andrew went to New Mexico.
- b. No, he went to UTAH (not NEW MEXICO).

(34) Parallel Focus:

Andrew bought a STARSHIP, but Peter bought a PLANET.

Note that although the existence of a set of alternatives may be necessary to evoke a contrastive focus, it is not sufficient. For instance, the five kinds of contrastive focus introduced in (34) are not necessarily conceived of as equally contrastive or ‘prominent’ even though all of them evoke sets of alternatives. It appears that availability of alternatives does contribute to ‘prominence’, but it does not guarantee it.

Now, with the distinction of completive and contrastive focus in mind, let us return to one of the dilemmas we had with respect to the focus-related effects of scrambling, i.e. the apparent contradiction between the two generalizations: one, that a focused element cannot scramble; and the other, that a (contrastively) focused element can. Compare (35) and (36) again.

- (35) a. ?*weil Hans das BUCH dem Mann gegeben hat
 because Hans the book(Acc) the man(Dat) given has
 ‘because Hans gave the book to the man’

b. *weil Hans ein BUCH dem Mann gegeben hat
 because Hans a book(Acc) the man(Dat) given has
 ‘because Hans gave a book to the man’

(36) a. weil Hans das BUCH dem Mann gegeben hat (nicht die ZEITUNG)
 because Hans the book the man(Dat) given has not the newspaper
 ‘because Hans gave the book to the man, not the newspaper’

b. weil Hans ein BUCH dem Mann gegeben hat (nicht eine ZEITUNG)
 because Hans a book the man(Dat) given has not a newspaper
 ‘because Hans gave a book to the man, not a newspaper’

Note that the surface forms in (35) and (36) are identical except for the phrases in parentheses.⁷ Now that we have two distinct types of focus in hand, though, we can see that the focus in the examples in (35) is a completive focus or a purely new-information type of focus, and the focus in the examples in (36) is a contrastive focus, i.e. a ‘replacing’ kind in Dik et al.’s classification. In the latter, a set of alternatives to the focused element is evoked in each case which includes *die Zeitung* and *eine Zeitung* respectively, thus making the focused item *das Buch* or *ein Buch* ‘prominent’. Thus, the acceptability of the above scrambled structures depends on the contextual information, i.e. whether or not the context is contrastive enough or whether or not the scrambled element is presented prominently enough.

It is interesting to note that Dik et al. include as contrastive the ‘restricting’ and the ‘expanding’ focus which involve focus particles such as *only*, *also*, and *even* (upper-bounded and lower-bounded scalars respectively in Horn (1972)). This class of words,

⁷In fact, a contrastive focus usually receives a stronger pitch accent than a completive focus, although I put both of them in upper case. This may be because in a contrastive focus, its ‘prominence’ contributes to the pitch accent in addition to its ‘newness’ doing so.

often called ‘focus adverbs’ or ‘focus-sensitive particles’, has been claimed to have an intimate connection with focus. This phenomenon has been called ‘association with focus’ (Jackendoff 1972, Rooth 1985, 1992). When an element is modified by *only* or *even*, then it presupposes that there already exist some alternatives to it: *only* ‘restricts’ the set of alternatives by picking only one member out of it, and *even* ‘expands’ the set by adding a member to it. Recall that in section 3.1.3, even a nonspecific phrase can scramble if it is modified with one of these ‘focus adverbs’. The examples are repeated here in (37).

- (37) a. weil Hans NUR ein BUCH dem Mann gegeben hat
 because Hans only a book(Acc) the man(Dat) given has
 ‘because Hans gave only a book to the man’
- b. weil Hans SOGAR ein BUCH dem Mann gegeben hat
 because Hans even a book(Acc) the man(Dat) given has
 ‘because Hans gave even a book to the man’

If we assume, following Dik et al. (1981), that the focus associated with adverbs such as *only* and *even* is contrastive focus, as distinct from completive focus, then, the set of examples in section 3.1.3 which showed “anomalous” behavior with respect to scrambling can naturally fall under the cover of ‘contrastive focus’.⁸

The discussion of the focus-related effects of scrambling in this section leads us to the following generalization regarding the focused elements.

- (38) Scrambling of Focus elements:
- a. Completive focus cannot scramble.
 - b. Contrastive focus can scramble.

⁸Neeleman (1994) provides similar examples involving the focus adverbs in Dutch. They also show “unusual” scrambling behavior.

Therefore, the apparent contradiction noted between the anti-focus effect and the contrastive focus effect can be understood as the result of partial observation of the focus phenomena: the former only refers to completive focus, whereas the latter to contrastive focus.

What is more interesting is that it is ‘prominence’ which differentiates the two types of focus. Namely, ‘prominence’ is what counts in scrambling in focus elements because only the ‘prominent’ focus can scramble. Recall that we described link or topic also as prominent in the previous section, which implies that link and contrastive focus share the same property. I argue this is indeed the case. Let’s turn to next section for supporting evidence.

3.2.4 Topic and Contrastive Focus

Topic also can be conceived of as ‘contrastive’ in standing out among other potential “topical” elements in the discourse. That is, a topic is compared either with other alternatives within the sentence, i.e. the tail elements, or by being implicitly or explicitly contrasted with other topics outside of the sentence.⁹ Consider the following examples (39) and (40) again, repeated from section 3.2.1.

(39) a. What about Mary? What did she give to Harry?

b. MARY_{Link} gave a SHIRT_{Focus} to Harry.

(40) a. What about Harry? What did Mary give to him?

b. TO HARRY_{Link} Mary gave a SHIRT_{Focus}.

In (39), for example, the fact that this sentence is about *Mary*, among the ground items, can be interpreted as that the sentence is *not* about the tail elements, e.g.

⁹In this sense, the current notion of topic is more like that of contrastive or shifted topic rather than that of continuous or continuing topic (Herring 1990, Aissen 1992). Continuing topics need not be prominent and only refer to an entity which is already introduced into the discourse. They are more like tail in the current system.

Harry or a giving event. On the other hand, the fact that (39) is about *Mary* can also mean that the sentence is *not* about other topics, e.g. the topic *to Harry* in (40) (cf. ‘link-contrast’ in Vallduví (1992:71–72) ‘contrastive topic’ in Szabolcsi (1981:518–519)).

I provide two cases where topic and contrastive focus behave alike. One is the syntactic operation ‘topicalization’ in English, and the other is the morphological marking by the so-called ‘topic’ marker *nun* in Korean. I argue that these are mechanisms which encode ‘prominence’ of elements, one, syntactically, and the other morphologically.

Topicalization and Focus Movement

It is often noted that ‘topicalization’ in English is not a uniform phenomenon in terms of the information status of the fronted item. Namely, the fronted (‘topicalized’) element is sometimes interpreted as ‘topic’, but sometimes interpreted as ‘focus’.¹⁰ Thus, Gundel (1974), for example, separates a ‘Topic topicalization’ from a ‘Focus topicalization’. Chafe (1976:49) likewise notes these two types of topicalization and calls the first a topicalization ‘with two foci of contrast’ (the first focus being ‘topic’ and the second focus being ‘focus’ as in (41)) and the second a topicalization with a ‘single focus of contrast’ (as in (42)). Prince (1981) also distinguishes the former ‘Topicalization’ from the latter ‘Focus Movement’.¹¹ The following are some examples. (The small capitals represent topics and the large capitals represent focus (both contrastive and completive).)

¹⁰This is true with German topicalization too, although the syntactic properties of topicalization are slightly different in that the finite verb is necessarily in the second position. Recall the discussion of Verb Second in chapter 2.

¹¹She actually identifies one more type, i.e. ‘Yiddish-Movement’, which only occurs in a dialect of English.

- (41) a. BEANS I don't LIKE. (Ross 1967:168)
 b. THE PLAY John saw YESTERDAY. (Chafe 1976:49)

The fronted elements in (41), *beans* and *the play*, are the topic of each sentence. They are what the sentences are 'about' and thus are presented more prominently than the tail elements in the sentence, e.g. *I* in (41a) and *John* in (41b). The part following the topic is the comment to it, and therefore the comment can include some new information or focus such as *not like* in (41a) and *yesterday* in (41b).

In contrast, the fronted element, i.e. *Fido*, in (42) is focus, i.e. new information. The elements to its right is the ground material, which may include a topic, e.g. *their dog* (or they may be all tail).

- (42) FIDO they named their dog. (Prince 1981:259)

I argue that this fronted focus is contrastive focus, i.e. prominent focus. The focus in (42) is much more emphatic or prominent than the one, for instance, in (43).

- (43) They named their dog FIDO.

Several people have pointed out that the focus encoded by a fronted item is different in its informational import from that encoded by a non-fronted counterpart (Ward 1988, Vallduví 1993). Ward (1988), for example, shows that in cases like (42), the fronted phrase actually refers to two discourse elements: one, a set or scale, and the other, a specification of a value or an element in that set or scale. This is exactly the property we used to characterize contrastive focus: a set of alternatives and a value in that set. In (42), this alternative set is the set of dog names and the value is *Fido*, which is an unexpected one. In other words, in (42), there is a strong sense of comparison or contrast of the value *Fido* with other alternative values, thus making this value really stand out among the alternatives. This standing-out property is 'prominence'. In contrast, in (43), the value *Fido* is not necessarily compared or contrasted with other values (although it could be).

To summarize, ‘topicalization’ in English not only encodes the topichood of the fronted element but also expresses the contrastive focality. If we assume that topic and contrastive focus share the property of being ‘prominent’ in discourse, English topicalization can be regarded as a uniform phenomenon, namely, an operation of encoding ‘prominence’.

Nun-Marking in Korean

Morphological marking by the so-called ‘topic’ marker *nun* in Korean is another case where topic and contrastive focus are grouped together. That is, a phrase marked with *nun* is always either a topic or a contrastive focus, but never a tail or a completive focus. Namely, *nun* is a ‘prominence’ marker in Korean.

The affix *nun* in Korean has traditionally been called the “topic” marker because when it is attached to the subject, it encodes the topichood of the subject. The “topic” marker *nun* is distinguishable in its topic-encoding property from the regular nominative case marker *ka*. A *ka*-marked phrase is discourse-neutral. This distinction is illustrated in (44a) and (44b).

(44) a. Swuni-**ka** Inho-lul mannassta.

Swuni-Nom Inho-Acc met

‘Swuni met Inho.’

b. Swuni-**nun** Inho-lul mannassta.

Swuni-Top Inho-Acc met

‘As for Swuni, she met Inho.’ [Topic]

The nominative-case marked subject *Swuni-ka* in (44a) simply functions as the subject of the sentence and is not restricted in terms of discourse-informational properties. However, the *nun*-marked subject *Swuni-nun* in (44b) expresses the fact that the sentence is ‘about’ Swuni, i.e. *Swuni* is the topic of the sentence.

In contrast, when *nun* marks a non-subject element, as in (45b), it has a different function. It expresses the fact that the phrase which is marked with *nun* is a contrastive focus.

- (45) a. Swuni-ka Inho-**lul** mannassta.
 Swuni-Nom Inho-Acc met
 ‘Swuni met Inho.’
- b. Swuni-ka Inho-**nun** mannassta.
 Swuni-Nom Inho-Top met
 ‘Swuni met Inho (but nobody else).’ [Contrastive Focus]

The object *Inho-nun* in (45b) is implicitly compared with other alternative people, and the sentence implies that the situation is not necessarily true for those alternatives. When the object is marked with the regular accusative case marker *lul* as in (45a), this reading is not evoked.

The distinction between topic and contrastive focus shown in (44) and (45) cannot simply be reduced to that of grammatical relations, i.e. subject versus non-subject. Word order also plays a role. (46a) and (46b) are the scrambled variants of (44b) and (45b) respectively.

- (46) a. Inho-lul Swuni-**nun** mannassta.
 Inho-Acc Swuni-Top met
 ‘As for Inho, Swuni (but nobody else) met him.’ [Contrastive Focus]
- b. Inho-**nun** Swuni-ka mannassta.
 Inho-Top Swuni-Nom met
 ‘As for Inho, Swuni met him.’ [Topic]

Interestingly, when the *nun*-marked subject is scrambled over by another phrase in the sentence, as in (46a), it loses its topic reading, but instead achieves a contrastive focus

reading. On the contrary, when the *nun*-marked object scrambles over another phrase, as in (46b), it loses its contrastive focus reading and becomes the topic of the sentence. (This problem will be discussed in greater detail in chapter 5 in connection with the information structuring constraints presented in the later part of this chapter.)

What is important with this morphological marking in Korean is that even though the reading of a *nun*-marked phrase may change depending on its relative position in the sentence, as demonstrated in (46), *nun* always encodes either topic or contrastive focus, but nothing else. That is, a *nun*-marked phrase, whether subject or non-subject, or whether sentence-initial or not, cannot be tail or completive focus. In Korean literature (Choe 1935), there has been a controversy as to whether *nun* should be classified as a topic marker or as a contrast marker. This problem is easily solved if we assume that both topic and contrastive focus are ‘prominent’: *nun* in Korean is the ‘prominence’ marker.

To summarize, topic is an element of a sentence which is singled out and then talked about among several potential alternatives in the discourse. These alternatives are already anchored in the discourse, i.e., they are ground or ‘old/known’ information. Contrastive focus, likewise, is singled out among several potential alternatives. However, in this case, the alternative are ‘new’ information, i.e. potentially focal items. I have called this property of being singled out among potential alternatives *prominent*. Both topic and contrastive focus are ‘prominent’ discourse elements.

3.3 Scrambling and Information Structuring Constraints

To recapitulate the discussion in the previous section, I have argued that scrambling cannot be properly understood without a deeper understanding of information

structure. While examining the anti-focus effect and the contrastive focus effect in Vallduví's (1992) framework of information packaging, I have proposed a further division of focus according to 'prominence'. Moreover, it was suggested that Topic and Contrastive Focus share the 'prominence' property.

Based on the findings in the previous section, I propose a feature-based information structure, which can systematically capture the cross-classificatory nature of the four information units. In the following part, a set of constraints are introduced which participate in the mapping between information structure and phrase structure. I argue that these 'information structuring' constraints are the major motivations for alternative phrase structural descriptions of a sentence, namely, scrambling.

3.3.1 Feature-Based Information Structure

Crossclassifying Features

The scrambling facts in German call upon us to make some revisions to Vallduví's information packaging system introduced in section 3.2.1. As shown in (47), Vallduví does not further classify focus into any subgroups.¹²

$$(47) \text{ S} = \{\text{focus, ground}\}$$

$$\text{ground} = \{\text{link, tail}\}$$

To capture the distinct behavior of contrastive focus in scrambling, therefore, the notion of focus should be finer-grained. Initially, I propose that focus be divided into completive focus and contrastive focus, just as the ground is divided into link and

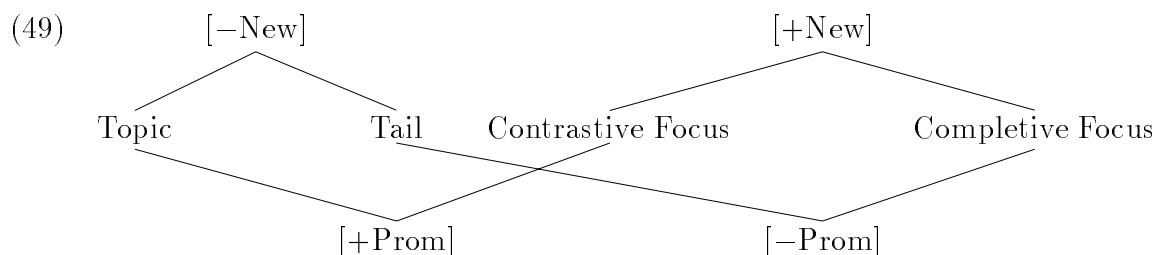
¹²Vallduví (1992:71–72) argues that contrastive focus, or focus-contrast in his terms, is derivable in his system. Using the file-card analogy again, Vallduví argues that there are actually two ways of keeping the record on a file card: one is to simply *add* the information and the other is to *substitute* the information for an already existent record. In our terms, the former is completive focus and the latter is contrastive focus. In effect, Vallduví (1992) also has two kinds of focus by letting the two different record-keeping mechanisms (addition and substitution) derive the informational differences.

tail. Hence, I suggest the basic information structure in (48) by adding contrastive focus to Vallduví's system (47). (I hereafter return to the more traditional term 'topic' instead of 'link' because I am not necessarily assuming the information storage function implied in the term.) The new information structure can be illustrated as in (48).

$$\begin{aligned}
 (48) \quad S &= \{\text{focus, ground}\} \\
 \text{ground} &= \{\text{topic, tail}\} \\
 \text{focus} &= \{\text{completive focus, contrastive focus}\}
 \end{aligned}$$

With the further division in focus added to the system, we now have four different types of information units, i.e. topic, tail, completive focus, and finally contrastive focus. As shown in (48), topic and tail are grouped together as ground materials, i.e. old or given information in discourse, while completive focus and contrastive focus are classified as focus materials, i.e. new or novel information. That is, the characteristic which distinguishes topic and tail on the one hand, and completive focus and contrastive focus on the other hand, is the 'discourse-newness'. I will call this feature [New]. Thus, the former are marked [−New] and the latter marked [+New]. Then, as we have observed in the previous section, both ground and focus can be further partitioned in terms of 'discourse-prominence', which will be called [Prom] here. Topic and contrastive focus are prominent while tail and completive focus are not. So, the former are [+Prom] and the latter [−Prom].

The two information partitioning features [New] and [Prom], therefore, give the following cross-classification of the four information types.



Each information type is then represented by a pair of features in the new feature-based system, which is illustrated in (50).

(50)

	Topic	Contrastive Focus	Tail	Completive Focus
Prom	+	+	−	−
New	−	+	−	+

One of the advantages of this feature-based information structure is that it can crossrefer to more than one distinct informational type. For example, topic and tail can be grouped together as being $[-New]$, as Vallduví does by calling them ‘ground’. Also, we can crossrefer to topic and contrastive focus together as $[+Prom]$ elements. This crosscutting property of the system is absolutely crucial in explaining the discourse effects of scrambling as we will see shortly. In the discrete primitive-based system such as Vallduví’s (1992, 1993), however, it is not easy to explain why topic and (contrastive) focus should behave alike, for example. As mentioned above, topic belongs to ground and (contrastive) focus belongs to focus, and in Vallduví’s system, they are only two distinct kinds of information. Now, with the new feature-based system, we can easily refer to topic and contrastive focus together as $[+Prom]$ items. At the same time, their differences, the one being old information, and the other being new information can easily be captured by the values of the $[New]$ feature, i.e. the former is $[-New]$ and the latter $[+New]$.

Restrictions on Feature Marking and Underspecification

So far I have implicitly assumed that every element of a sentence equally participates in the information structuring as an independent entity and accordingly that each element has an equal chance to be specified with the discourse features [New] and [Prom]. Of course, this is too simplistic a view of information structuring.

First of all, some lexical items may not function as an independent discourse entity, perhaps due to their intrinsic morphological properties, and hence cannot be marked with those features. Complementizers, particles, and probably some adverbs are examples of such items and they may not hold discourse features independently.

Even a more contentful element is not always specified with these features as an independent unit, if it is part of a bigger information unit. For example, recall the focus projection examples discussed in chapter 2. In the Korean example in (51), the verb *ssu* will be specified [+New,+Prom] according to our information structure since it is marked with the contrastive focus marker *nun*.

- (51) Mary-ka [emeni-eykey phyenci-lul [ssu-ki-**nun**]_F]_F hay-ss-ta.
 Mary-Nom mother-Dat letter-Acc write-Nml-Top do-Pst-Dcl
 ‘Mary did write her mother a letter.’

As noted before, this sentence can be interpreted in several different ways depending on how far up the focus in the verb is projected within the VP. This is shown in (52).

- (52) a. Mary WROTE a letter to her mother, but she did not SEND it to her.
 b. Mary WROTE A LETTER to her mother,
 but she did not SEND A PRESENT to her.
 c. Mary WROTE A LETTER TO HER MOTHER,
 but she did not SEND A PRESENT TO HER FATHER.

This indicates that other elements in the VP, i.e. *emeni-eykey* ‘to mother’ and *phyenci-lul* ‘the letter’, are not specified by themselves in terms of the discourse features and that those of the verb *ssu*, i.e. [+New,+Prom], are projected onto them. If the projection is carried all the way up to the VP as in (52c), the VP will have the following feature marking.

- (53) [emeni-eykey phyenci-lul ssu-ki-**nun**]
 [[+New,+Prom]]_[+New,+Prom]

On the other hand, it is also possible that none of the internal elements have independent feature markings, but that only the outer unit which contains the elements does. This kind of situation happens when a VP, for example, is presented as new information as a whole. Consider the following example.

- (54) a. What did Mary do yesterday?
 b. She [went to school]_F.

In (54b), the whole VP *went to school* is the focus, the new information, and the internal elements do not necessarily have independent feature marking. This means that the contained elements are dependent on the larger unit and they are informationally neutral with respect to each other. This is shown in (55).

- (55) [went to school]
 []_[+New,-Prom]

Information structuring is thus subject to several different types of constraints. These constraints may be morphological, which prevent certain lexical items from being assigned any discourse features. They may be syntactic, which make a certain phrase form an information unit. Or they may be semantic, which prohibit a certain element from receiving a specific feature due to semantic incompatibility. In these

cases, some elements in the sentence may not be able to be given independent feature marking. It is beyond the scope of this dissertation to explore the exact feature marking mechanism. However, I will argue later that the specificity effect is one of the cases where a semantic restriction on information feature marking is applied. In what follows, for the purposes of scrambling, I will assume a flat information structure in which all non-verbal arguments are equally specified with [New] and [Prom]. In other words, scrambling of a phrase is possible when the phrase has an independent information status.

3.3.2 Information Structuring Constraints

Now, let us recall the scrambling behavior of each information type, which is generalized as in (56) and (57).

(56) Scrambling of Ground elements:

- a. Ground elements, both topic and tail, can scramble.
- b. Topic more easily scrambles than tail.

(57) Scrambling of Focus elements:

- a. Completive focus cannot scramble.
- b. Contrastive focus can scramble.

Given the newly proposed information structure based on crosscutting features, I propose that the scrambling behavior can be reduced to two generalizations. The first is a requirement on the [−New] information, i.e. topic and tail, and the other is on the [+Prom] information, i.e. topic and contrastive focus. I will call these two ‘Information Structuring Constraints’. They are defined in (58).

(58) Information Structuring Constraints:

- a. NEW: A $[-\text{New}]$ element should precede a $[\text{+New}]$ element.
- b. PROM: A $[\text{+Prom}]$ element should precede a $[-\text{Prom}]$ element.

The first constraint NEW immediately explains the first generalization in (56a) that a ground element, topic or tail, which is $[-\text{New}]$ in our information structure, can be out of its canonical position, unless it already precedes the $[\text{+New}]$ elements in the sentence in the canonical configuration. In other words, if topic or tail does not precede focus in the canonical structure, this constraint gives preference to a scrambled structure in which the former precedes the latter. On the other hand, the second constraint PROM explains the distinction between completive focus and contrastive focus expressed in (57): this constraint permits only a contrastive focus, i.e. a $[\text{+Prom}]$ element, to scramble. Also, PROM is responsible for the contrast between topic ($[\text{+Prom}]$) and tail ($[-\text{Prom}]$) in their scrambling possibilities described in (56b). The information structuring constraints NEW and PROM, working together, yield the following consequences. Firstly, a completive focus, which is $[\text{+New}, -\text{Prom}]$, is the least likely element to be out of its canonical position because neither NEW nor PROM motivates it to scramble. Also, they yield another consequence that topic, which is $[-\text{New}, \text{+Prom}]$, is most likely to scramble because both NEW and PROM endorse its scrambling. As expected, however, the alternative ordering is restricted by the phrase structural constraints CANON. Recall that CANON would act against any non-canonically ordered structures. We will see this interaction in chapter 4 and 5 in great detail.

Note that these constraints are defined simply as a precedence relation, and not as a hierarchical notion like ‘c-command’. The underlying motivation behind this is to make the constraint general enough to apply to languages with various phrase structures, including flat ones, rather than just to languages with highly configurational

structures. Therefore, in actual application, the precedence relation can be realized in several different forms depending on the language. If the phrase structural constraints of a language are very minimal (e.g., because the constraint ECONOMY OF EXPRESSION outranks the the ENDOCENTRICITY ALIGNMENT constraints as suggested by Bresnan (1996)), so that the language is ‘non-configurational’ having a flat sentence structure, then the ‘precedence’ entails linear precedence. Therefore, the constraints in (58) would have the effect of swapping two constituents to change the linear order if necessary. In contrast, if the phrase structural constraints of a language are defined and ranked such as to prefer highly articulated (right-branching) phrase structures such as those in German, then the ‘precedence’ results from the ‘c-command’ relation. In configurational languages, this constraint would make a constituent scramble, i.e., be adjoined to a higher maximal projection, or object-shift, i.e., be generated in a higher Spec position.¹³

The information structuring constraints, in short, tend to realign the order among the constituent elements of the sentence according to each element’s information status. In fact, the idea that discourse-functional notions such as new and old, or topic and focus, are responsible for word order has a long history. For example, the idea that ‘old information precedes new information’, which is the basis of the first constraint NEW, is by no means novel in research on word order in the Prague School or in other functionalist work (Sgall et al. 1986, Li and Thompson 1976, among many others). It has been argued in many places that ‘topic precedes comment’, ‘theme precedes rheme’, ‘old information precedes new information’, etc. However, it has also been noted that the mere old/new distinction hardly captures all the word order

¹³Whether an element out of its canonical position is adjoined or generated in a Spec position will be further constrained by other relevant considerations of the language, which is not our main concern here. It can be noted, however, that generating something in a Spec position will be more costly than adjoining it because the former involves generating a new projection, which is against the general constraint of ECONOMY OF EXPRESSION.

generalizations. Givón (1989:Ch.6), for example, argues that the Praguean view on word order based on the old/new distinction does not always work, and points out that in many languages, more ‘important’ or ‘urgent’ information tends to be uttered earlier in a sentence and that this information does not have to be ‘old’. This notion of ‘importance’ or ‘urgency’ is analogous to the notion of ‘prominence’ in our feature-based information structure (see also Payne (1987) and Austin (in press) for similar proposals).

The difference in the current information structuring constraints lies in that they are OT constraints. Each constraint is violable and interacts with other constraints in terms of the ranking among them. Moreover, these constraints also interact or rather compete with phrase structural constraints; so the word order is no longer a matter of simply lining up arguments according to a single type of information, whether syntactic or discourse-functional. It is viewed rather as a complex interface phenomenon.

Before closing this section, let me introduce another information structuring constraint in addition to the two introduced above. This one is a prosodic structural requirement on ‘new’ information. Although this constraint is not directly related to word order itself, it has an indirect effect on the anti-focus effect of scrambling.

(59) Prosodic Constraints:

- a. [+ \acute{N}]: Put a high pitch accent on a [+New] element.
- b. * \acute{X} : Do not place any pitch accent.

The first constraint, [+ \acute{N}], says to ‘put a high pitch accent on a new-informational element.’ This constraint is to capture the fact that focus elements (completive or contrastive) have high pitch accents or prosodic prominence, while topic and tail do not. Topical elements can also have some amount of pitch accent, but it is smaller

compared to focused elements, so I will assume, for the purposes of the present discussion, that only focal elements have pitch accents to capture the categorical distinction between old and new elements in terms of prosodic prominence.¹⁴ Obviously, this view of sentential intonation is greatly simplified and by no means comprehensive, but it is serviceable for the purposes of the scrambling facts (see Jackendoff (1972), Prince (1981), and Steedman (1991) and the references therein for more detailed discussion on sentential intonation in terms of information status of elements of the sentence).¹⁵

The second constraint, $*\acute{X}$, in contrast, says *not* to put a high pitch accent on anything. This constraint, therefore, is naturally in conflict with the $[+\acute{N}]$ constraint. Again, the conflict is resolved by the ranking between them. As expected, $[+\acute{N}]$ is ranked higher than $*\acute{X}$.

(60) Ranking:

$$[+\acute{N}] \gg *\acute{X}.$$

This ranking will have the effect of favoring a focused element with a high pitch accent, rather than one without. Actually, almost all focused elements—at least in German—seem to get pitch accents (abstracting away from the default sentence intonation). If this is true, the two constraints could be collapsed into one constraint which would guarantee the biuniqueness of the new information and the high pitch accent, e.g., by making the $[+\acute{N}]$ constraint bidirectional (Vivienne Fong p. c.): all and only $[+\text{New}]$

¹⁴An alternative view would be to say that $[+\text{Prom}]$ also receives a pitch accent, i.e. $[+\acute{P}]$. Then, a contrastive focus ($[+\text{New}, +\text{Prom}]$) will have the highest pitch, reinforced by $[+\acute{N}]$, and then a completive focus and a topic will have some, and finally a tail will not have any pitch accent.

Although it seems quite plausible, I do not pursue this line of approach in order to consistently present the data provided by Lenerz (1977) and Abraham (1986) who equate ‘focus’ and ‘high pitch accent’. Also, in Korean, the only way to distinguish topic and contrastive focus in some cases (e.g. in the sentence-initial position) is the pitch accent, as will be discussed in chapter 5. Thus, I will maintain the above assumption that only $[+\text{New}]$ elements are pitch-accented.

¹⁵Even without any contextual information, a sentence has a default intonation pattern, in which some final constituent of the sentence is usually stressed, e.g. the very last phrase in English or the penultimate phrase in Dutch (cf. Reinhart 1995). I do not deal with the default intonation here.

information should get a high pitch accent. However, such convergence does not always occur. For example, in Czech new information does not and actually should not carry stress in certain positions (Mirjam Fried p. c.). Considering the universal nature of constraints in Optimality Theory, I therefore keep these two constraints separate although it does not make much difference either way in German.

3.4 Specificity and Information Structure

Our discussion has, so far, been concentrated on the focus-related effects of scrambling. It has been argued that the discourse notions such as newness ([New]) and prominence ([Prom]) play crucial roles in scrambling. Discourse-old ([−New]) and discourse-prominent ([+Prom]) elements scramble. In this sense, scrambling is viewed as a discourse–syntax mapping phenomenon in which discourse information such as the information status of each element of a sentence is realized syntactically in terms of different word orders, i.e. scrambling.

In this section, we will turn our attention to the semantic effect of scrambling, i.e. the specificity effect (see section 3.1). In short, I will argue that the specificity effect can also be subsumed under the general scheme of understanding scrambling as a discourse–syntax mapping phenomenon. This claim is in contrast with the direct semantics–syntax approach of de Hoop (1992) and Diesing (1992, 1994).

3.4.1 Specificity Effect Revisited

Earlier in this chapter, it was pointed out that the scramblability of a phrase is also affected by a semantic property, namely, its specificity. As described in section 3.1.1, while a specific phrase can easily scramble, a nonspecific phrase, with its existential interpretation, cannot scramble. This semantic effect is illustrated in the grammatical distinction between (61a) and (61b), in which the former involves a scrambled definite

NP and the latter involves a scrambled indefinite NP.¹⁶

(61) a. Ich habe **den Brief** meinem Bruder geschickt.
 I have the letter(Acc) my brother(Dat) sent
 ‘I sent the letter to my brother.’

b. *Ich habe **einen Brief** meinem Bruder geschickt.
 I have a letter(Acc) my brother(Dat) sent
 ‘I sent a letter to my brother.’

Diesing (1992) and de Hoop (1992) find answers to this problem in the direct syntax–semantics mapping (see section 3.1 for details of their analyses). The basic idea is that a certain syntactic property associated with the scrambled position, whether it is (strong) Case as in de Hoop (1992) or the syntactic scope (VP) of the existential operator as in Diesing (1994), is responsible for the licensing of the semantic property of specificity. Simply, nonspecificity cannot be licensed in the scrambled position, which is why a nonspecific NP cannot scramble, as shown in (61b).

In contrast, I argue that a nonspecific NP’s general inability to scramble is not due to its incompatibility with certain syntactic properties associated with particular phrase structural positions, but to its intrinsic discourse property, which prevents it from being interpreted as ‘old’ or [–New] information. In other words, I argue that the solution to the specificity problem in scrambling lies in the semantics–discourse/pragmatics interface rather than in the semantics–syntax interface. This approach enables us to give a uniform account of the scrambling both of specific and of nonspecific phrases as an information structurally motivated phenomenon.

¹⁶As pointed out earlier in this chapter, the distinction is not between definite and indefinite phrases, but between the so-called ‘strong’/‘presuppositional’ and ‘weak’/‘existential’ phrases, so that an indefinite NP with the former type of interpretation can also scramble. I will continue to call the ‘strong’/‘presuppositional’ phrases ‘specific’ regardless of their definiteness.

This approach is supported by two pieces of evidence already mentioned earlier in this chapter. Firstly, definite phrases are immune to the semantics-syntax mapping hypothesis.

- (62) a. Ich habe meinem Bruder **den Brief** geschickt.
 I have my brother(Dat) the letter(Acc) sent
 ‘I sent my brother the letter.’
- b. Ich habe **den Brief** meinem Bruder geschickt.
 I have the letter(Acc) my brother(Dat) sent
 ‘I sent the letter to my brother.’

Although Diesing (1994) claims that definite phrases must scramble out of the VP, that is not the case, as shown in (62a). As Diesing herself partially points out, a definite phrase can also stay in the canonical position depending on its information status. Diesing treats the in-situ definite phrases as an exceptional case which is limited to the special ‘focus’ interpretation case. However, as Lenerz (1977) shows, these definites can be interpreted as nonfocal entities in the base position. Look at the example in (63).

- (63) a. Wem hast du den Brief geschickt?
 whom(Dat) have you the letter(Acc) sent
 ‘To whom did you send the letter?’
- b. Ich habe meinem Bruder **den Brief** geschickt.
 I have my brother(Dat) the letter(Acc) sent
 ‘I sent my brother the letter.’

The definite phrase *den Brief* ‘the letter’ in (63b) is a [–New] information because it was already mentioned in the preceding sentence (63a), and the focus, i.e. the

[+New] information is *meinem Bruder* ‘my brother’. Still, *den Brief* can be in the base position as shown in (63). Thus, a definite phrase in its canonical position cannot be explained even with the provision of the special ‘focus’ case. The optionality demonstrated in (63) is explained by the interaction between NEW and CANON in the current analysis, as I will show in chapter 4.

Secondly, even a nonspecific phrase can scramble under particular discourse circumstances, i.e. in a contrastive focus context. Recall the contrastive focus effect discussed in section 3.1.3.

- (64) weil Hans ein BUCH dem Mann gegeben hat (nicht eine ZEITUNG)
 because Hans a book to the man given has not a newspaper
 ‘because Hans gave a book to the man, not a newspaper’

The example (64) cannot be accounted for by the semantics-syntax mapping analyses which are based on the idea that the semantics of an indefinite NP is determined by its position. According to such analyses, the scrambled indefinite NP *ein Buch* should receive a strong or presuppositional reading. However, with contrastive focus, *ein Buch* in (64) bears an existential interpretation.

To sum up the relationship between the specificity of a phrase and its scramblability, it is neither the case that every specific phrase scrambles, because definite phrases need not scramble, nor the case that every scrambled phrase is specific, because contrastively focused phrases need not be specific. In short, as shown in the above two cases, the specificity effect is often overridden by discourse effects. So, no one-to-one mapping obtains between specificity and scramblability, although it is still a fairly strong tendency that a scrambled phrase is specific.

In next section, I will examine what the intrinsic discourse-pragmatic properties of nonspecific phrases are, and more generally, how the specificity of an entity is related to its information status in the discourse. I argue that this connection between

specificity and information status is indirectly responsible for the limited scrambling options of nonspecific NPs.

3.4.2 Specificity and Information Status

As discussed in 3.3, information feature marking is not free. Information structure can be hierarchically structured so that the internal elements may not always be assigned features. Or certain elements may not be compatible with a specific feature for morphological or semantic reasons and thus end up with no feature specification. I argue in this section that the specificity effect is a result of a mismatch between semantic specificity and discourse newness, which leaves a nonspecific NP underspecified with the discourse features. This makes a nonspecific NP informationally dependent on the larger information unit, which accounts for the observation of the so-called ‘predicate modifier’ interpretation (de Hoop 1992).

Semantic definiteness, referentiality, or specificity is often discussed in relation to discourse notions such as familiarity or oldness. It is often argued that a specific or referentially-anchored NP is a discourse-old, familiar, or discourse-linked entity, whereas a nonspecific or referentially non-anchored NP is a discourse-new entity (Heim 1982, Enç 1991, Pesetsky 1987). Heim (1982), for example, argues that both indefinite and definite NPs introduce variables but that they differ in that indefinite NPs are “new” entities while definite NPs are “familiar” entities. Similarly, Enç (1991) argues that specificity can eventually be reduced to discourse-familiarity. In languages which have morphological means of realizing this distinction such as English and German, the former is usually realized as a definite NP while the latter as an indefinite NP. In fact, an indefinite NP can also denote a specific (‘strong’ or ‘presuppositional’) entity as argued by de Hoop (1992) and Diesing (1992). We will simply treat this kind of indefinite NPs just like definite NPs and group them together here as ‘specific’.

Given that the feature [New] in our information structure is also based on the discourse-oldness/newness, we can make parallel assumptions about specificity that specific phrases are [−New] while nonspecific phrases are [+New]. Let me initially propose the hypothesis in (65).

- (65) a. A specific phrase is [−New].
 b. A nonspecific phrase is [+New].

This appears to be a quite plausible assumption since a nonspecific indefinite NP usually introduces a new entity into the discourse; as such it becomes new information or focus in the discourse. On the other hand, a specific definite phrase usually refers to an entity which is already existent in the discourse, therefore this old entity often functions as given or ground information. The example in (66) is a clear case which illustrates this point.

- (66) a. Was hat Hans dem Schüler gegeben?
 what(Acc) has Hans the student(Dat) given
 ‘What did Hans give to the student?’
 b. daß Hans dem Schüler ein BUCH gegeben hat
 that Hans the student(Dat) a book(Acc) given has
 ‘that Hans gave the student a book’

The specific phrase *dem Schüler* is a familiar entity in the discourse, and thus used as ground ([−New]) information here. On the other hand, the nonspecific phrase *ein Buch* is an unfamiliar, unknown entity, and thus functions as a focus ([+New]).

However, this is not always the case. As we will see below, there are some contexts which disturb this nice semantics–discourse linking. Sometimes, a specific phrase is forced to be interpreted as if it were a ‘new’ entity, or sometimes a nonspecific phrase

is forced to be interpreted as if it were ‘old’ information. Let us consider these cases in the following small sections.

Specific New Entity

One context in which a specific phrase is forced to be interpreted as a ‘new’ entity is when it is introduced in the discourse as an answer to a *wh*-question. In terms of our information structure, it is the case where the specific phrase is interpreted as a focus, either completive or contrastive. Consider the example in (67).

- (67) a. Was hat Hans dem Schüler gegeben?
 what(Acc) has Hans the student(Dat) given
 ‘What did Hans give to the student?’
- b. daß Hans dem Schüler das BUCH gegeben hat
 that Hans the student(Dat) the book(Acc) given has
 ‘that Hans gave the student the book’

Diesing (1994:12–14) notes a similar situation and describes it as a context where a definite NP is “subject to a focused or contrastive interpretation which presumably overrides the familiar status of the variable introduced by the NP by signaling that novel information is being, or about to be, presented”. The information status of the specific phrase is ambivalent: it still encodes a “familiar’ entity (otherwise, it would be presented as an indefinite phrase), but the current context forces it to behave as if it were not known in the discourse, i.e. as an unfamiliar entity. This ‘new’ definite phrase, such as the one in (67), may be analogous to a reactivated ‘dormant’ file-card in Vallduví’s (1993) file-card analogy. Being a definite phrase, it has a preexistent file card already created for it. However, this file-card may not have been used for a while (‘dormant’), and thus in the current discourse, it can be freshly referred to, i.e.

‘reactivated’, as if it were a ‘new’ entity.¹⁷

So, the inherently ‘familiar’ property of a specific phrase can be overridden in a particular context such as the one in (67), and then it is interpreted as a temporary [+New] entity. Casting this problem of overriding from the viewpoint of Optimality Theory, we think of this case as one where a certain constraint is violated. Suppose that the semantics–discourse linking hypotheses proposed above are OT-style constraints, which are universal and also violable.

(68) SPECIFICITY:

- a. SP1: A specific phrase should not be [+New].
- b. SP2: A nonspecific phrase should not be [−New].

These constraints are the ones which control the feature marking in the information structure. They determine which element may or may not be marked with which feature. Then, we can conceive of the ‘new’ specific entity case as one in which the first part of the SPECIFICITY constraint, SP1, is violated. Thus, a specific phrase (which is supposed to be [−New]) is forced to be interpreted as a [+New] entity in this context.

Nonspecific Old Entity?

Now, let us consider the reverse case. Can a nonspecific phrase be interpreted as an ‘old’ entity as well? Simply put, the answer is no. A nonspecific phrase cannot be [−New]. In OT terms, this would mean that the second part of the SPECIFICITY constraint, SP2, is so strong or highly ranked that it would never be violated.

¹⁷This problem may really involve two different types of discourse-oldness, for example, discourse-oldness and hearer-oldness (Prince 1992). So, the ‘new’ specific phrase would be classified as a ‘discourse-new and hearer-old’ entity. See Ward and Birner (1995) for the application of this notion to the *there* construction in English.

A nonspecific phrase refers to an entity which is not referentially anchored in discourse, namely, an entity which is unfamiliar or unknown in discourse. Usually, it has the function of introducing a new entity into the discourse rather than referring to one which is already in the discourse. This is the intuition that Webelhuth (1992) tries to capture when he states that a nonspecific indefinite NP is ‘inherently focused’. In Vallduví’s (1993) file-card analogy, this means that there is no file-card which has been created for it. For example, consider (69).

- (69) a. I bought **a book**.
 b. Where did you buy **it/the book**?

As usual, a nonspecific indefinite NP *a book* in (69a) introduces a new entity in the discourse, whose reference is unknown or undetermined. In a normal context, it is then immediately referentially anchored and therefore is replaced by a definite NP or a pronoun as shown in (69b). Now the definite NP *the book* refers to a specific book which the person in (69a) bought and is thus treated as ‘known’.

On the other hand, in a context like (70), *a book* still remains unidentifiable even after the initial introduction.

- (70) a. I bought **a book**.
 b. Where did you buy **a book**?

As in (69), a nonspecific indefinite NP *a book* in (70a) introduces a new entity of a ‘book’ kind in the discourse. However, in this case, it is still not referentially anchored in the second sentence (70b). It seems that the speaker in (70b) postpones the discourse-anchoring process of the newly-introduced entity, ‘a book’, and does not treat it as an independent entity, but instead handles the event of ‘buying a book’ as an unanalyzable whole. Namely, the speaker is only interested in the buying event not in the individual book. Compare (70b) with (69b). So the question in (70b) is more likely to be interpreted as ‘Where did you do the book-buying activity?’.

Now, recall the discussion of the feature specification in the information structure in section 3.3.1. It was noted there that not all elements of the sentence are specified with discourse features, [New] or [Prom]. Some are underspecified. One case in which this underspecification occurs is when an element is contained in a larger informational unit, for example a VP. In this case, only the larger unit is specified with the discourse features, but not each component element. Not being independently specified, the contained elements are informationally dependent on the larger unit.

This is the situation which describes the example in (70b). The VP *buy a book* is presented as a single informational unit in (70b), actually as [–New] since the book-buying information is already introduced in the previous sentence in (70a). However, the indefinite NP *a book* which is contained in the VP does not hold a feature marking itself. Thus, it is informationally dependent on the containing VP structure. I argue that this informational dependency of a nonspecific NP makes it reinterpreted almost like a ‘predicate modifier’ rather than an independent entity. This differs from de Hoop’s (1992) proposal that the ‘predicate modifier’ reading is derived from the ‘weak’ Case assignment, i.e. from a syntactic property. I argue that the information-based approach has an advantage because a nonspecific NP is not interpreted as a ‘predicate modifier’ if it achieves independent information status. When an indefinite NP introduces a new entity in the discourse, as in the first sentence in (70a), it is marked [+New] itself and interpreted as a regular argument. That is, the semantic interpretation relies on the information status.

Now, let us return to the specificity problem and see how the indefinite NP is interpreted there.

- (71) a. Wem hat Hans **ein Buch** gegeben?
 who(Dat) has Hans a book(Acc) given
 ‘To whom did Hans give a book?’

- b. daß Hans dem SCHÜLER **ein Buch** gegeben hat
 that Hans the student(Dat) a book(Acc) given has
 ‘that Hans gave the student a book’
- b’. *daß Hans **ein Buch** dem SCHÜLER gegeben hat
 that Hans a book the student(Dat) given has
 ‘that Hans gave the student a book’

In (71b), the nonspecific NP *ein Buch* cannot be interpreted as [+New], because its initial introduction has already happened and the focus has shifted to another element *dem Schüler*. It cannot be interpreted as [−New] by itself either because it is not referentially anchored (SP2). Not being able to be informationally marked, it becomes part of the larger information unit, i.e. [ein Buch gegeben]_[−New] just as in (70b). It is hence interpreted as a dependent part of the predicate. Since *ein Buch* is not informationally independent and thus not holding any discourse feature itself, scrambling is not even an issue. Recall that the information structuring constraints, which motivate scrambling, do not apply to an element which is not discourse-marked.

To summarize, a nonspecific NP cannot scramble as an ‘old’ element because when it is not referentially anchored, it becomes informationally dependent. As mentioned at the beginning of this section, this phenomenon can be understood in OT as a constraint which is hardly violable. Namely, the second part of the SPECIFICITY constraint, which controls the relationship between semantic specificity and discourse-oldness in the information structure, is so strong that it cannot be violated.

(72) SP2: A nonspecific phrase should not be [−New].

Note that this does not prevent a nonspecific NP from scrambling as a ‘new’ element as long as the information structuring constraints permit this. If it is a contrastive focus, the PROM constraint would allow its scrambling although the NEW constraint

would not. Exactly how these constraints will interact will be examined in the next chapter.

Therefore, with the provision of the SPECIFICITY constraints as a restriction on the information feature marking, I argue that scrambling can be uniformly explained as a discourse–syntax mapping phenomenon without recourse to the direct syntax–semantics mapping mechanisms of Diesing (1994) or de Hoop (1992). The specificity effect results from a semantics–discourse mismatch in which a nonspecific NP is forced to be interpreted as an ‘old’ entity, which is restrained by a semantics–discourse mapping constraint, SP2.

3.5 Summary

In this chapter, I have examined alternative ordering phenomena or scrambling and attempted to find motivations for the variation. Having investigated various semantic and discourse-related effects associated with scrambling, i.e. the specificity, anti-focus, and contrastive focus effects, I have proposed a view of information structure based on the crosscutting discourse features, [New] and [Prom], as a generalization tool to capture the meaning-related effects of scrambling. I argued that the alternative structural descriptions or the scrambled variants are motivated by a need to instantiate the information structure in terms of phrase structure. I have proposed two information structuring constraints NEW and PROM as major driving forces for the alternations.

In other words, the information structuring constraints in grammar try to realign the elements of the sentence according to their information status. Therefore, they are in tension with the phrase structural constraints (introduced in chapter 2), which try to align the constituents according to their grammatical information (see the relevant discussion in chapter 2). Basically, the information structuring constraints act against the phrase structural constraints, which force all elements of the sentence to be in

their ‘canonical’ positions, and motivate and permit these elements to be out of their ‘canonical’ positions, if they meet these informational requirements. Therefore, these constraints compete with each other, and yield more complicated results, which are the various scrambled structures. In Optimality Theory, the interaction or the conflict resolution among different constraints is carried out by the ranking among them. Now, in chapters 4 and 5, I will propose particular rankings of these constraint, namely, the grammars of German and Korean. As will be shown, the two languages are almost identical in their word order possibilities, and only differ in one aspect: the subject effect. This difference will be handled with a slight change in the rankings of the constraints in each language.

Chapter 4

Optimality Theory and Scrambling in German

In chapter 2, I have argued that the so-called ‘canonical’ word order in scrambling languages is determined by a set of phrase structural constraints which control the mapping from one syntactic structure which contains information such as predicate-argument relations or grammatical functions, to another syntactic structure which represents information such as categorization and constituency. These constraints, which I call *CANON*, therefore, favor one particular phrase structural description over others, unless some other factors in the language such as discourse-pragmatic information give preference to other structural descriptions. This particular structure or the consequent order is the so-called ‘canonical’ or ‘unmarked’ order.

In chapter 3, I have examined what aspects of language influence and motivate the choice of non-canonical orders. Based on the fact that alternative structures are not equivalent in their interpretation, I have investigated semantic and discourse factors associated with scrambling and proposed that they be better accounted for in terms of information structure (cf. Vallduví 1992, 1993). I have presented a model of information structure, which is based on two crosscutting discourse features, [New]

and [Prom], and identified two information structuring constraints NEW and PROM as major driving forces for scrambling. These constraints control the mapping from the information structure to the phrase structure.

In this chapter, utilizing the core ideas in Optimality Theory (Prince and Smolensky to appear, Grimshaw 1993, Grimshaw in press), I will show how varying scrambled structures are derived by the interactions among the constraints developed in the previous chapters. Here, each alternative structure of a sentence is viewed as the ‘optimal’ output which encodes the syntactic (e.g. grammatical-functional structure) and also discourse-pragmatic (e.g. information structure) information provided in the input in the best possible way by means of phrase structure and/or prosodic structure. It is shown that, while searching for the optimal output in each context, the semantic and discourse effects (i.e. the specificity, anti-focus, and contrastive-focus effects) often associated with scrambling naturally follow from the constraint competition from the different modules of grammar.

This chapter is organized in two parts. In section 4.1, the basic OT layout for the scrambling phenomena is illustrated. Section 4.2 then demonstrates the OT derivations for various ordering possibilities in different contexts, and thus shows how the semantic and pragmatic restrictions on scrambling are captured by Optimality-Theoretic interactions.

4.1 Optimality Theory and Scrambling

In this section, I lay out the basic Optimality-Theoretic set up for scrambling. In particular, I discuss the input and output representations, and also the ranking of the constraints involved in scrambling which have been developed in chapter 2 and chapter 3.

Optimality Theory is designed in such a way that for a given input, there is one

“optimal” output, which violates fewer highly-ranked constraints than the other candidate outputs and thus wins over them. In this theory, only this output is considered “grammatical” with respect to the given input. For the “free” word order phenomena under discussion now, the competition can be thought of as arising among the alternative sentential structures differing in phrase structure (e.g. string order), i.e. the scrambled variants of a sentence. Here, each alternative structure of a sentence is viewed as the optimal output in a given context, which reconciles the given information structure and other syntactic information in the best way.

4.1.1 Inputs and Information Structure

In Optimality Theory, a grammar is a function which maps inputs to outputs. Inputs for syntax are the basic building blocks, such as lexical items and the information about how they are related to each other, from which syntactic structures are built. For example, Grimshaw’s (1993, 1995) input for an extended projection contains a lexical head and its argument structure, an assignment of lexical heads to its arguments, and also tense and aspect specifications. Similarly, Legendre et al. (1993) and Legendre et al. (1995b) also use some form of predicate-argument structure for their inputs. (1b) is an example input for a sentence like (1a).

- (1) a. Mary saw John.
 b. $\langle see(x, y), x = Mary, y = John, Past \rangle$

It is not clear, however, whether the non-argument elements of a sentence such as adverbs would be included in this type of input, but it is obvious that the input for the scrambling phenomena needs to include adjuncts as well as arguments because adverbs also play a crucial role in constituent ordering. Therefore, I suggest, following Bresnan (1996:8), that an input is a set of lexical heads (including adjuncts) and an underspecified or skeletal f-structure indicating how the heads are to be related to

each other. (2b) is an example of the underspecified f-structure for a sentence like (2a).

(2) a. Mary saw John yesterday.

b.
$$\left[\begin{array}{ll} \text{PRED} & \text{'see(x,y)'} \\ \text{GF}_1 & \left[\text{"Mary"} \right]_x \\ \text{GF}_2 & \left[\text{"John"} \right]_y \\ \text{GF}_3 & \left[\text{"yesterday"} \right] \\ \text{TENSE} & \text{'Past'} \end{array} \right]$$

The only major difference between (1) and (2) is that the latter can include non-argument phrases. Otherwise, the differences are primarily notational.

In addition, I argue that the input contains information about each element's information status. As argued in chapter 3, the information structure of a sentence is absolutely crucial in determining the constituent structure, e.g. linear order, in scrambling languages. Accordingly, I propose that each element in the skeletal f-structure is marked with the discourse features [New] and [Prom] according to its information status, as I have proposed in the previous chapter. The feature-based information structure is repeated here as (3).

(3)

	+Prom	−Prom
−New	Topic	Tail
+New	Contrastive Focus	Completive Focus

As a matter of fact, it has been proposed in several places that the input materials should contain certain semantic or pragmatic information, which includes definiteness specification (Grimshaw in press), abstract 'prominence' specification (Legendre et

al. 1993), and scope information (Legendre et al. 1995b). Interestingly, Grimshaw and Samek-Lodovici (1995:2) suggest that inputs include “information about which phrases are foci, and which are coreferent with the topic”. The following in (4) are some examples.

- (4) a. $\langle \text{sing}(x), x = \text{topic}, x = \text{John} \rangle$
 b. $\langle \text{give}(x, y, z), x = \text{topic}, z = \text{focus}; x = \text{John}, y = \text{present}, z = \text{Mary} \rangle$

Grimshaw and Samek-Lodovici’s (1995) proposal is very similar to the one I propose here in the sense that the input contains such discourse-functional information as topic and focus. The difference lies in that in the current system as illustrated in (3), the information structure is represented with the crossclassifying features, i.e. [New] and [Prom], which enables us not only to recognize the existence of such information types as topic and focus, but also to capture the similarities and differences among different information types. For example, topic and focus usually behave differently since they have distinct values for the [New] feature. That is, topic is [−New] and focus (completive or contrastive) is [+New]. However, topic and (contrastive) focus sometimes behave alike since they share a feature, i.e. [+Prom], although they still differ in the value of the feature [New].

Now, let’s return to the scrambling data and see what their input representation would look like.¹ Consider the German sentence in (5) which has a ditransitive clause embedded in it. As in chapter 2, I will concentrate on the embedded clause which has more freedom in terms of word order.

¹From now on, I will only focus on the nonverbal elements of a sentence, i.e. subject, direct object, and indirect object, etc. because verbal elements do not scramble (although they may topicalize). This may be because verbal elements cannot adjoin.

- (5) Ich glaube daß Hans dem Schüler das Buch gegeben hat.
 I believe that Hans the Student(Dat) the book(Acc) given has
 ‘I believe that Hans gave the student the book’

The embedded clause in (5) has three non-verbal elements in it. German word order is indeed “free” so that we can have all six possible permutations of these three items (Uzbekoiteit 1987).² This is illustrated in (6).

- (6) a. daß Hans dem Schüler das Buch gegeben hat
 b. daß Hans das Buch dem Schüler gegeben hat
 c. daß dem Schüler Hans das Buch gegeben hat
 d. daß das Buch Hans dem Schüler gegeben hat
 e. daß dem Schüler das Buch Hans gegeben hat
 f. daß das Buch dem Schüler Hans gegeben hat

Although they differ in order, the clauses in (6) have the same predicate-argument structure or basic f-structure. This basic argument-structural information can be represented in the input as in (7).³

²As expected, some orders are more marked than others. Also not all speakers accept all the orders demonstrated here: some never allow any orders in which subject is not in the initial position. Generally speaking, the orders towards the bottom in (6) are worse or more marked. This markedness issue will be briefly discussed from the OT perspective in the concluding chapter.

³The input represented by the underspecified f-structure also includes any information brought by the lexical entries of arguments, such as case and agreement features, in addition to the predicate-argument information. To keep the representations simple, I do not list these features in the inputs.

$$(7) \left[\begin{array}{ll} \text{PRED} & \text{'geben(x,y,z)'} \\ \text{GF}_1 & \left[\text{"Hans"} \right]_x \\ \text{GF}_2 & \left[\text{"dem Schüler"} \right]_y \\ \text{GF}_3 & \left[\text{"das Buch"} \right]_z \\ \text{TENSE} & \text{'Past'} \end{array} \right]$$

However, they are not necessarily equivalent in their discourse-contextual meaning. In the present framework this means that they may have different input representations in terms of information structure. In other words, the elements in the input may have different feature markings with respect to [New] and [Prom].

Suppose, for example, that a sentence has a focus, but does not have any specific topic.⁴ This means that there is some [+New] element in this sentence, but there is no [+Prom] element. In other words, all the elements have equal status in terms of prominence, and thus no one element is more prominent than another.⁵ This information structure is the ‘background–focus’ (Dahl 1974, Chafe 1976) or the ‘presupposition/open-proposition–focus’ type (Jackendoff 1972, Prince 1986, Ward 1988), or the ‘tail–focus’ type in Vallduví (1992, 1993). This type of information structure usually occurs as an answer to a *wh*-question, as shown in (8).⁶

⁴I assume that every sentence has a focus, i.e. new information, following Vallduví (1992). Otherwise, a sentence would consist only of old information, which would simply be a repetition of the already known information.

⁵One could argue that focus is also “prominent” because the new information is also ‘distinct’ from the non-new information in the rest of the sentence. However, this is not the sense of prominence I am using here: being “prominent” by being the informative part of a sentence is termed [+New] here. Only contrastive focus is prominent or [+Prom] in this system. See chapter 3 for a review of the properties of these features.

⁶Note that the upper case representation in the examples do not necessarily mark special ‘emphasis’. To be consistent with the data provided by Lenerz (1977), Abraham (1986), and Webelhuth (1992), I represented all focused elements alike, whether completive or contrastive, in upper case.

- (8) a. Was hat Hans dem Schüler gegeben?
 what(Acc) has Hans the student(Dat) given
 ‘What did Hans give to the student?’
- b. Hans hat dem Schüler das BUCH gegeben.
 Hans has the student(Dat) the book(Acc) given
 ‘Hans gave the student the book.’

In this case, the input will be marked as in (9), which does not differ in the feature [Prom] (everything is marked as [–Prom] by default), but only differs in the feature [New]. (For ease of presentation, I will hereafter simply mark the discourse features under each lexical item.⁷)

⁷I do not make any claims here about how exactly the information structure (i-structure) should be internally structured other than that it contains [Prom] and [New] as primitives. This topic certainly needs further research (see also the discussion in section 3.3.1 in chapter 3). Also, an input could be represented as the corresponding pair of the (underspecified) f-structure and the i-structure linked together by a mapping function, similar to what exists between the c-structure and the f-structure. However, I do not pursue this issue here.

$$(9) \left[\begin{array}{l} \text{PRED} \quad \text{'geben(x,y,z)'} \\ \\ \text{GF}_1 \quad \left[\begin{array}{l} \text{"Hans"} \\ \text{New} - \\ \text{Prom} - \end{array} \right]_x \\ \\ \text{GF}_2 \quad \left[\begin{array}{l} \text{"dem Schüler"} \\ \text{New} - \\ \text{Prom} - \end{array} \right]_y \\ \\ \text{GF}_3 \quad \left[\begin{array}{l} \text{"das Buch"} \\ \text{New} + \\ \text{Prom} - \end{array} \right]_z \\ \\ \text{TENSE} \quad \text{'Past'}$$

Here, the sentence (8b) is simply partitioned into the old/given part and the informative/new part (Halliday 1967) as being an answer to a question like (8a). The direct object *das Buch* in (8b) is the new information because it is the part corresponding to the *wh*-phrase in (8a), and the rest of the sentence is the given information. Therefore, the former is marked [+New] and the latter [−New] in this system. On the other hand, since no one item is presented as a standing-out or prominent element, e.g. with stress or with a certain phrase like *what about?* in the previous discourse, nothing is marked [+Prom]. Therefore, (9) is the input that is given expression in the utterance of (8b).

Now, suppose that a certain element, the subject, for instance, is presented ‘prominently’. This can be achieved by putting a slightly higher pitch accent on it or by putting it in a phrase like *what about?* as in (10).

- (10) a. *Wie steht's mit Hans? Was hat Hans dem Schüler gegeben?*
 how stand it with Hans what has Hans the student(Dat) given
 'What about Hans? What did Hans gave to the student?'
- b. *Hans hat dem Schüler das BUCH gegeben.*
 Hans has the student(Dat) the book(Acc) given
 'Hans gave the student the book.'

$$(11) \left[\begin{array}{l} \text{PRED} \quad \text{'geben(x,y,z)'} \\ \\ \text{GF}_1 \quad \left[\begin{array}{l} \text{"Hans"} \\ \text{New } - \\ \mathbf{Prom } + \end{array} \right]_x \\ \\ \text{GF}_2 \quad \left[\begin{array}{l} \text{"dem Sch\u00fcler"} \\ \text{New } - \\ \text{Prom } - \end{array} \right]_y \\ \\ \text{GF}_3 \quad \left[\begin{array}{l} \text{"das Buch"} \\ \text{New } + \\ \text{Prom } - \end{array} \right]_z \\ \\ \text{TENSE} \quad \text{'Past'}$$

Signaled by the preceding sentence *Wie steht's mit Hans?* 'What about Hans?' in (10a), the subject *Hans* is understood now as prominent. It is more prominent than other elements of the sentence in (10b). Hence, it is marked [+Prom] and the other elements are marked [-Prom]. Also, just as in (8), the *wh*-question signals that the focus of the following sentence is *das Buch* 'the book'. Accordingly, *das Buch* gets the [+New] marking. This results in the information structure of the 'topic-focus-tail'

type in Vallduví (1992). *Hans* is the topic, i.e. ‘prominent old information’, *das Buch* is the (completive) focus, i.e. ‘nonprominent new information’, and the rest is the tail, i.e. ‘nonprominent old information’.

4.1.2 Outputs and Candidate Set

Outputs are all the possible structural descriptions or parses of a given input, which are generated by GEN. GEN instantiates an input by assigning it syntactic and other (e.g. prosodic) structures. In a parallel structure framework like LFG, GEN will produce pairs of corresponding c-structures and f-structures (fully specified with substitution of specific functions for the underspecified GFs) (Bresnan 1996).⁸ Since GEN produces “all” universally possible structures (according to X’ theory, for instance), it not only generates “acceptable” parses in a particular language, but also generates “unacceptable” ones. It is the input’s job to collect the relevant outputs from among those in the universal set of structures and to put them in the candidate set. So, the input determines what structures compete in a candidate set.

Grimshaw (in press) suggests that the outputs in a candidate set have “non-distinct logical forms” although this has been denied by some for scope considerations (Legendre et al. 1995b). Under the current assumptions, the candidate outputs can be conceived of as those which share the same underspecified f-structure or argument structure, such as the one given above, repeated here as in (12).

⁸The process of this full specification of functions is carried out by different mechanisms depending on the language: it may be determined by phrase structural configurations, thematic roles, or morphological case marking (Bresnan and Zaenen 1990, Legendre et al. 1993). Since this is not the major concern in the present discussion, I will assume that the function specification is executed by relevant mapping functions.

$$(12) \left[\begin{array}{ll} \text{PRED} & \text{'geben(x,y,z)'} \\ \text{GF}_1 & \left[\text{"Hans"} \right]_x \\ \text{GF}_2 & \left[\text{"dem Sch\u00fcler"} \right]_y \\ \text{GF}_3 & \left[\text{"das Buch"} \right]_z \\ \text{TENSE} & \text{'Past'} \end{array} \right]$$

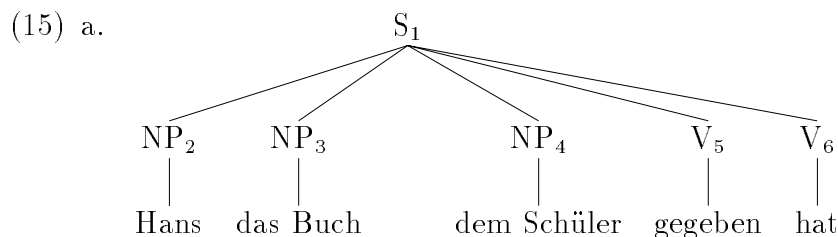
In this sense, we can assume that all the scrambled variants including the default-ordered one in (13a) belong to the same candidate set.

- (13) a. da\u00df Hans dem Sch\u00fcler das Buch gegeben hat
 b. da\u00df Hans das Buch dem Sch\u00fcler gegeben hat
 c. da\u00df dem Sch\u00fcler Hans das Buch gegeben hat
 d. da\u00df das Buch Hans dem Sch\u00fcler gegeben hat
 e. da\u00df dem Sch\u00fcler das Buch Hans gegeben hat
 f. da\u00df das Buch dem Sch\u00fcler Hans gegeben hat

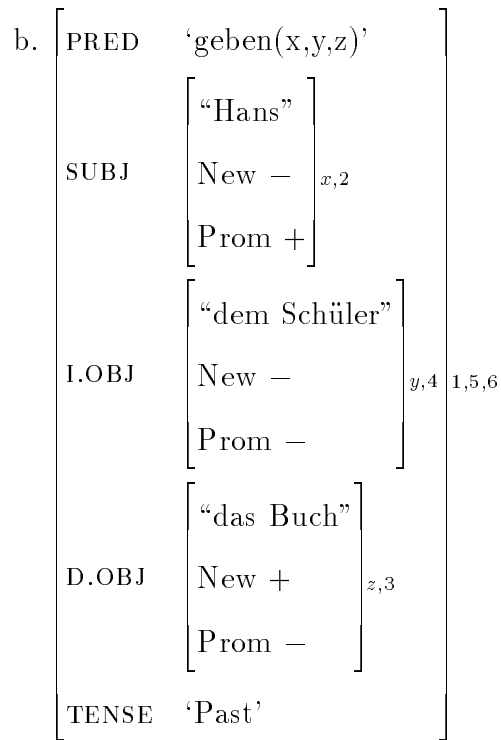
The actual syntactic output representations will be pairs of corresponding c-structures and f-structures for a given underspecified f-structural input, following Bresnan (1996). I list only a few examples here for the input given in (14).

(14)
$$\left[\begin{array}{l} \text{PRED} \quad \text{'geben(x,y,z)'} \\ \\ \text{GF}_1 \quad \left[\begin{array}{l} \text{"Hans"} \\ \text{New } - \\ \text{Prom } + \end{array} \right]_x \\ \\ \text{GF}_2 \quad \left[\begin{array}{l} \text{"dem Schüler"} \\ \text{New } - \\ \text{Prom } - \end{array} \right]_y \\ \\ \text{GF}_3 \quad \left[\begin{array}{l} \text{"das Buch"} \\ \text{New } + \\ \text{Prom } - \end{array} \right]_z \\ \\ \text{TENSE} \quad \text{'Past'}$$

In Optimality Theory, GEN, in principle, generates “all” possible structures universally available (Legendre et al. 1993). Therefore, it can produce, for instance, completely ‘flat’ structures for any sentence in (13). Let’s take (13b) as an example, which is instantiated as a flat structure in (15). (In the following pairs of c-structures and f-structures, the mapping between them is represented by the corresponding numbers in each representation.⁹)

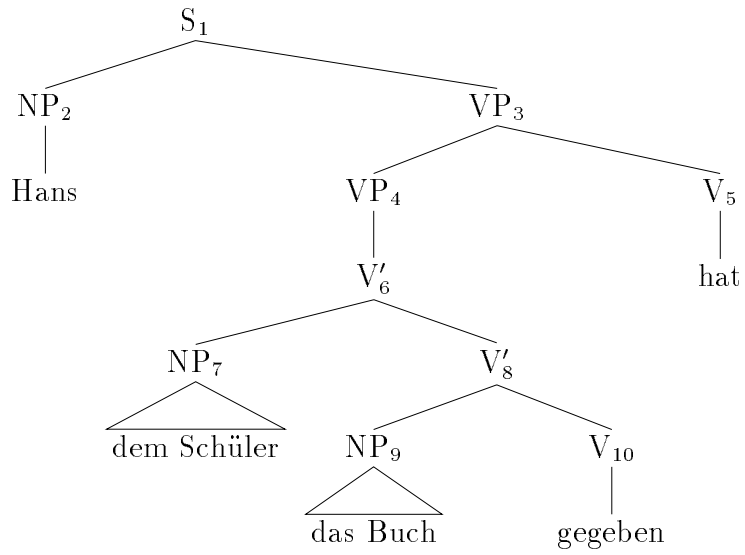


⁹In the f-structures below, I use I.OBJ and D.OBJ, short for Indirect Object and Direct Object respectively to avoid any confusion, instead of OBJ and OBJ_θ, which are more standard terms. See (Zaenen et al. 1985) for discussion of OBJ and OBJ_θ.



As assumed in chapter 2, however, this parse will be ruled out by the constraint interaction between ECONOMY OF EXPRESSION and ENDOCENTRICITY ALIGNMENT. Since German ranks ENDOCENTRICITY ALIGNMENT higher than ECONOMY OF EXPRESSION, more hierarchical structures which project VPs, such as the one in (16) or (17), are favored over flat structures (Bresnan 1996) (see chapter 2 for arguments in favor of configurational structures for German and Korean). (16) yields the order in (13a), the canonical order, and (17) generates the order in (13d).

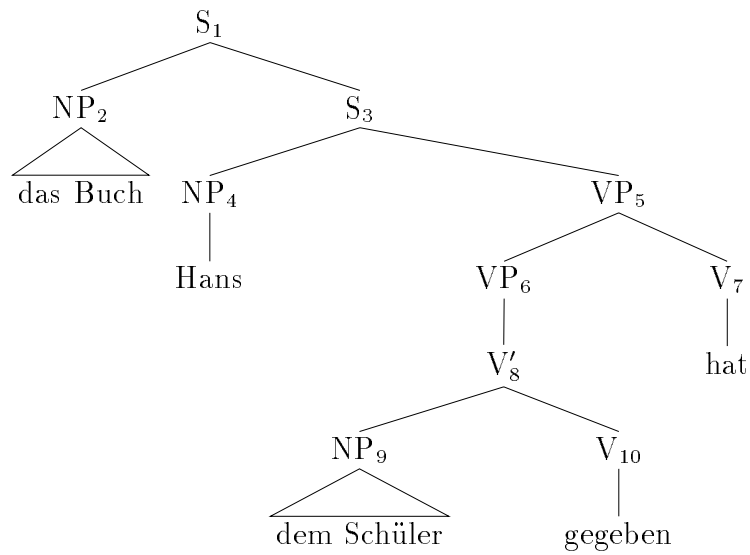
(16) a.



b.

PRED	'geben(x,y,z)'				
SUBJ	<table border="1"> <tr><td>"Hans"</td></tr> <tr><td>New -</td></tr> <tr><td>Prom +</td></tr> </table> $x,2$	"Hans"	New -	Prom +	
"Hans"					
New -					
Prom +					
I.OBJ	<table border="1"> <tr><td>"dem Schüler"</td></tr> <tr><td>New -</td></tr> <tr><td>Prom -</td></tr> </table> $y,7$	"dem Schüler"	New -	Prom -	1,3,4,5,6,8,10
"dem Schüler"					
New -					
Prom -					
D.OBJ	<table border="1"> <tr><td>"das Buch"</td></tr> <tr><td>New +</td></tr> <tr><td>Prom -</td></tr> </table> $z,9$	"das Buch"	New +	Prom -	
"das Buch"					
New +					
Prom -					
TENSE	'Past'				

(17) a.



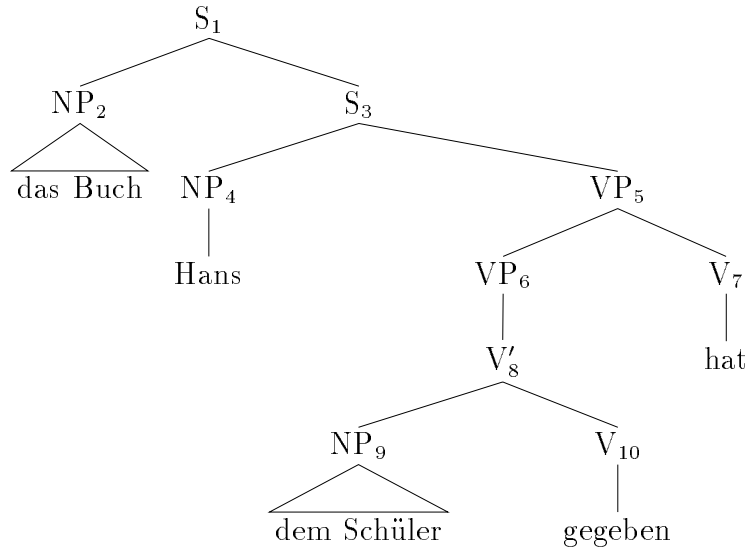
b.

PRED	‘geben(x,y,z)’							
SUBJ	<table border="1" style="border-collapse: collapse; width: 100%;"> <tr> <td style="padding: 2px 5px;">“Hans”</td> <td></td> </tr> <tr> <td style="padding: 2px 5px;">New –</td> <td style="padding: 2px 5px;">x,4</td> </tr> <tr> <td style="padding: 2px 5px;">Prom +</td> <td></td> </tr> </table>	“Hans”		New –	x,4	Prom +		
“Hans”								
New –	x,4							
Prom +								
I.OBJ	<table border="1" style="border-collapse: collapse; width: 100%;"> <tr> <td style="padding: 2px 5px;">“dem Schüler”</td> <td></td> </tr> <tr> <td style="padding: 2px 5px;">New –</td> <td style="padding: 2px 5px;">y,9</td> </tr> <tr> <td style="padding: 2px 5px;">Prom –</td> <td></td> </tr> </table>	“dem Schüler”		New –	y,9	Prom –		1,3,5,6,7,8,10
“dem Schüler”								
New –	y,9							
Prom –								
D.OBJ	<table border="1" style="border-collapse: collapse; width: 100%;"> <tr> <td style="padding: 2px 5px;">“das Buch”</td> <td></td> </tr> <tr> <td style="padding: 2px 5px;">New +</td> <td style="padding: 2px 5px;">z,2</td> </tr> <tr> <td style="padding: 2px 5px;">Prom –</td> <td></td> </tr> </table>	“das Buch”		New +	z,2	Prom –		
“das Buch”								
New +	z,2							
Prom –								
TENSE	‘Past’							

Note that the example outputs presented above all maintain the information given by the input: they all ‘faithfully’ parse the input information. GEN, however, can also generate ‘unfaithful’ outputs such as the one in (18), in which some of the input

information, i.e. the discourse features for *dem Schüler* and for *das Buch*, is not parsed. Compare it with the faithful parse in (17).

(18) a.



b.

PRED	‘geben(x,y,z)’	1,3,5,6,7,8,10						
SUBJ	<table style="border-collapse: collapse; margin-left: 10px;"> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">“Hans”</td> <td style="padding-left: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">New –</td> <td style="padding-left: 5px;">x,4</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">Prom +</td> <td style="padding-left: 5px;"></td> </tr> </table>		“Hans”		New –	x,4	Prom +	
“Hans”								
New –	x,4							
Prom +								
I.OBJ	<table style="border-collapse: collapse; margin-left: 10px;"> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">“dem Schüler”</td> <td style="padding-left: 5px;">y,9</td> </tr> </table>		“dem Schüler”	y,9				
“dem Schüler”	y,9							
D.OBJ	<table style="border-collapse: collapse; margin-left: 10px;"> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">“das Buch”</td> <td style="padding-left: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">Prom –</td> <td style="padding-left: 5px;">z,2</td> </tr> </table>	“das Buch”		Prom –	z,2			
“das Buch”								
Prom –	z,2							
TENSE	‘Past’							

These ‘unfaithful’ parses are usually not even considered to be competing with ‘faithful’ parses because in most cases ‘faithful’ parses win. This filtering of unfaithful parses is carried out by the ‘faithfulness’ constraint, which is usually ranked so high

in the grammar that it can rarely be outranked by other constraints in the grammar.¹⁰ The FAITHFULNESS constraint is given in (19) (Bresnan 1996).

(19) FAITHFULNESS Constraint:

All and only the attributes of input lexical heads appear in the output.

In addition to the syntactic instantiations, GEN also provides prosodic instantiations by assigning varying intonational patterns to each output. I will call these pairs of syntactic and prosodic structures the ‘surface’ structures.¹¹ Concentrating only on the non-verbal elements of the sentence, let’s suppose that GEN may or may not put a high pitch accent on each element. Then, since a ditransitive sentence has three non-verbal arguments, each distinctly-ordered variant will have eight prosodically different possible outputs because each of the three elements may or may not get a high pitch accent, i.e. $2^3=8$. Consider the first sentence of the six scrambled variants in (20) as an example. The eight different prosodic possibilities for this syntactic variant are shown in (21). (An element with a high pitch accent is represented in upper case in the examples.)

¹⁰Legendre et al. (1995b) argue that although unfaithful outputs are usually disfavored to faithful parses since they violate the fairly high-ranked ‘faithfulness’ constraints, they could win over faithful parses and become optimal when the faithfulness violations they incur are outranked by other violations of higher-ranked constraints by faithful parses. See also Grimshaw (1996) for an application of the idea of faithfulness violations.

¹¹Although I overlap the prosodic structure on the phrase structure as the ‘surface’ structure here for ease of exposition, many have argued that it is necessary to assume a separate level of prosodic structural representation (Selkirk 1984, Nespor and Vogel 1986, Inkelas 1989). Then, the ‘surface’ structure will be represented also as a pairing of the c-structure and the prosodic structure linked by a mapping function between them.

- (20) a. daß Hans dem Schüler das Buch gegeben hat
 b. daß Hans das Buch dem Schüler gegeben hat
 c. daß dem Schüler Hans das Buch gegeben hat
 d. daß das Buch Hans dem Schüler gegeben hat
 e. daß dem Schüler das Buch Hans gegeben hat
 f. daß das Buch dem Schüler Hans gegeben hat
- (21) a. daß Hans dem Schüler das Buch gegeben hat
 b. daß HANS dem Schüler das Buch gegeben hat
 c. daß Hans dem SCHÜLER das Buch gegeben hat
 d. daß Hans dem Schüler das BUCH gegeben hat
 e. daß HANS dem SCHÜLER das Buch gegeben hat
 f. daß HANS dem Schüler das BUCH gegeben hat
 g. daß Hans dem SCHÜLER das BUCH gegeben hat
 h. daß HANS dem SCHÜLER das BUCH gegeben hat

Since we have six distinctly-ordered variants for one ditransitive sentence, each of which has eight different prosodic patterns, we end up with 48 (6x8) possible candidates for each ditransitive sentence.

Now, the 48 outputs belong to the same candidate set and compete with one another to be selected as the optimal output. These outputs are the structural instantiations of the input which contains the discourse-contextual information (represented in the discourse features in the information structure) in addition to the syntactic information. Note that these 48 parses are all syntactically ‘good’, acceptable outputs (we have assumed that the filtering of ‘unacceptable’ syntactic structures is already taken care of). The outputs now compete to be the best fit for the given context. In other words, in scrambling languages, the best output will be the one which realizes the information structure of the input in the best way possible with a specific

structural description.

4.1.3 Constraints and Ranking

Outputs are evaluated by a set of ranked universal constraints. In Optimality Theory, constraints are violable. So, an output which violates some constraints can be an optimal one unless it violates more highly-ranked constraints than other candidates. A grammar of a particular language is considered to be a particular ranking of these universal constraints. In this section, I will examine the constraints which are involved in scrambling and the ranking among them for German.

As argued in chapter 2 and chapter 3, scrambling is constrained not only by syntactic constraints but also by discourse-pragmatic constraints. Just as there are constraints which control the mapping relations between the (underspecified) f-structure and the phrase structure, there are also constraints which control those between the information structure and the surface structure. The former are phrase structural constraints CANON and the latter are ‘information structuring’ constraints. (See section 2.2 and 3.3 for a review of these constraints.) These constraints are repeated from chapter 2 and chapter 3 in (22) and (23) below.

(22) CANON:

- a. CN1: SUBJ should be structurally more prominent than (e.g. ‘c-command’) non-SUBJ functions.
- b. CN2: Non-SUBJ functions align reversely with the c-structure according to the functional hierarchy.
(SUBJ > D.OBJ > I.OBJ > OBL > ADJUNCT)

(23) Information Structuring Constraints:

- a. NEW: A [−New] element should precede a [+New] element.
- b. PROM: A [+Prom] element should precede a [−Prom] element.

Let us briefly review how these constraints are interpreted. The phrase structural constraints in (22) basically align elements according to syntactic information, i.e. grammatical functions of the elements (see section 2.2 in chapter 2 for an alternative which is based on the thematic hierarchy.) On the other hand, the information structuring constraints align elements according to their information status, i.e., whether they are new or prominent information. Therefore, the grammar has two different sources constraining the constituent order, each of which has its own interest, i.e. to realize certain information in terms of the phrase structure. Naturally, they are potentially in conflict.

Optimality Theory provides a very good tool for resolving such potential conflicts. In fact, the theory itself is a process of conflict resolution in a sense. The OT constraints are universal and very general so as to be available to all languages, so there will be constraints which are contradictory to each other. Fortunately, constraints are also violable, which means that they are ready to negotiate with each other. The grammar resolves conflicts by giving some constraints preference over others. That is, constraints are ranked. Therefore, when conflicts arise, a higher-ranked constraint is given preference to realize its interest first. So, depending on which ranking a language takes, it will produce different word order possibilities.

Let us now see what the ranking of the constraints in (22) and (23) is in German. Consider CANON first. As discussed in chapter 2, it, in effect, generates the following ‘subhierarchies’ if there are three elements in a sentence (Baković 1995). Whenever a subhierarchy is violated, it incurs a mark. Thus, a total of three marks (***) is possibly generated.

- (24) a. SUBJ \prec I.OBJ
 b. SUBJ \prec D.OBJ
 c. I.OBJ \prec D.OBJ

The violation pattern for each order is presented in (25), repeated from chapter 2.

(25)

	CANDIDATES			CANON
a.	Subject	I.Object	D.Object	
b.	Subject	D.Object	I.Object	*
c.	I.Object	Subject	D.Object	*
d.	D.Object	Subject	I.Object	**
e.	I.Object	D.Object	Subject	**
f.	D.Object	I.Object	Subject	***

For example, (25b) incurs a mark because it violates the subhierarchy (24c), namely, it violates the canonical order between the indirect object and the direct object. Also, (25c) incurs a mark. In this case, it violates the subhierarchy (24a), i.e. the canonical order between the subject and the indirect object is disturbed. Interestingly, however, (25c) is regarded as much more marked than (25b) although both incur only one mark.

Consider the actual example in (26).

- (26) a. daß Hans **das Buch** dem Schüler gegeben hat
 that Hans the book(Acc) the student(Dat) given has
 ‘that Hans gave the student the book’
- b. daß **dem Schüler** Hans das Buch gegeben hat
 that the student(Dat) Hans the book(Acc) given has
 ‘that Hans gave the student the book’

Given no context, (26b) is much worse than (26a). We can find a clue to this in the fact that (26a) is a reordering among the objects while (26b) is a reordering which includes the subject. Generally, scrambling over the subject is very marked in

German.¹²

Now, recall that the phrase structural constraints CANON actually consist of two subconstraints, as repeated in (27). The first subpart CN1 is a constraint about subject versus non-subjects and the second CN2 is one about non-subjects.

(27) CANON:

- a. CN1: SUBJ should be structurally more prominent than (e.g. ‘c-command’) non-SUBJ functions.
- b. CN2: Non-SUBJ functions align reversely with the c-structure according to the functional hierarchy.

The facts shown above indicate that a violation of CN1 is more serious than that of CN2. In other words, CN1 is ranked higher than CN2.

(28) Ranking:

CN1 \gg CN2

In actual application, the violation of a subhierarchy which involves the subject, e.g. (24a) or (24b), causes a more serious problem than the violation of a subhierarchy which does not involve the subject, e.g. (24c). The grammatical distinction between (26a) and (26b) can thus be captured by the following tableau. Since (29b) violates the higher-ranked constraint, it loses to (29a).

(29)

	CANDIDATES			CN1	CN2
☺a.	Subject	D.Object	I.Object		*
b.	I.Object	Subject	D.Object	*	

The violation pattern based on the new ranking is given in (30).

¹²Some dialects do not allow examples like (26b) where subject is scrambled over at all.

(30)

	CANDIDATES			CN1	CN2
a.	Subject	I.Object	D.Object		
b.	Subject	D.Object	I.Object		*
c.	I.Object	Subject	D.Object	*	
d.	D.Object	Subject	I.Object	*	*
e.	I.Object	D.Object	Subject	**	
f.	D.Object	I.Object	Subject	**	*

Let us now consider the ranking between the information structuring constraints. There are two information structuring constraints, which are repeated here in (31).

(31) Information Structuring Constraints:

- a. NEW: A [-New] element should precede a [+New] element.
- b. PROM: A [+Prom] element should precede a [-Prom] element.

I propose that the PROM constraint be higher than the NEW constraint.

(32) Ranking:

PROM \gg NEW

This ranking explains the contrastive focus effect (see section 3.1 and 3.2 in chapter 3). Recall that a contrastive-focused element can scramble, as shown in (33) again.

(33) weil Hans das BUCH dem Mann gegeben hat (nicht die ZEITUNG)
 because Hans the book(Acc) the man(Dat) given has not the newspaper
 ‘because Hans gave the book to the man, (not the newspaper)’

A contrastive focus is a [+New,+Prom] element. CANON would not prompt this scrambling because it acts against all non-canonical structures. The constraint NEW would not encourage this scrambling either. It is in fact supposed to discourage it

because contrastive focus is also [+New]. Therefore, this leads to the conclusion that the constraint PROM is responsible for it. The fact that the PROM constraint causes scrambling in spite of the NEW constraint shows that PROM is ranked higher than NEW.

The example in (33) also shows that PROM is also higher than CN2. If CN2 were higher, the scrambling should not be possible. If both NEW and CN2 are lower than PROM, how are these two ordered? I argue that NEW and CN2 are not ranked with respect to each other. Or to put it in different words, both rankings are possible.¹³

(34) Ranking:

- a. NEW \gg CN2
- b. CN2 \gg NEW

This ranking is supported by the following data from Lenerz (1977). Consider the order between the indirect object *dem Schüler* and the direct object *das Buch* in (35).

- (35) a. Wem hat Hans das Buch gegeben?
 who(Dat) has Hans the book(Acc) given
 ‘To whom did Hans give a book?’

¹³Several different ways to interpret the unranked constraints have been proposed. Broihier (1995) summarizes three possible interpretations of tied constraints, which are discussed originally by Pesetsky (1993: class notes, cited by Broihier 1995). See also Anttila (1995) and Smolensky (1995).

- (i) a. ‘Branching’ Version of Tied Constraints:
Satisfaction of any one of the tied constraints suffices for satisfaction of the entire block of tied constraints.
- b. ‘Pooled Violation’ Version of Tied Constraints:
The marks from the tied constraints are combined into one column and evaluation proceeds, otherwise, as normal.
- c. ‘Reordering’ Version of Tied Constraints:
The candidates are run through each possible reordering of the tied constraints in parallel.

See also (Tesar 1995a, 1995b) for discussion of learnability problems with tied constraints.

b. Ich glaube daß Hans dem SCHÜLER **das Buch** gegeben hat.

I believe that Hans the student(Dat) the book(Acc) given has
 ‘I believe that Hans gave the student a book.’

b'. Ich glaube daß Hans **das Buch** dem SCHÜLER gegeben hat.

I believe that Hans the book(Acc) the student(Dat) given has
 ‘I believe that Hans gave the book to the student.’

In this context, *das Buch* is [−New] and *dem Schüler* is [+New]. Neither of them is [+Prom], so the constraint PROM is not relevant. Thus, the order competition here is a result of the interplay between NEW and CN2. As shown in (35), both orders are possible. (35b) says that CN2 is stronger than NEW while (35b') says that the opposite is true.¹⁴

Finally, consider the ranking between CN1 and the PROM constraint. The relevant fact to test is whether a [+Prom] element can scramble over a subject. From the speakers I consulted, the answer is yes, which gives the following ranking.

(36) Ranking:

PROM ≫ CN1

When a non-subject, e.g. *das Buch* in (37), is presented prominently, e.g. as the topic of the sentence, it can scramble over the subject, i.e. *Hans*. Look at the example in 37b).

(37) a. Wie steht's mit dem Buch? Wem hat Hans das Buch gegeben?

how stands it with the book who has Hans the book(Acc) given

‘What about the book? To whom did Hans give the book?’

¹⁴It might be the case that (35b) and (35b') are not really equivalent and there is some subtle difference between them, which implies that the ranking between NEW and CN2 should be fixed. I leave this question open for future research.

b. Ich glaube daß **das Buch** Hans dem SCHÜLER gegeben hat.

I believe that the book(Acc) Hans the student(Dat) given has

‘I believe that Hans gave the book to the student.’

However, as noted earlier, some speakers do not accept scrambling over subjects at all. For those, the ranking will be the reverse. For the rest of the chapter, I will describe the grammar which allows this scrambling and thus assume the ranking in (36).

With all subrankings fixed, we have the final ranking in (38) for German.

(38) Constraint Ranking (German):

$$\text{PROM} \gg \text{CN1} \gg \left\{ \begin{array}{l} \text{NEW} \\ \text{CN2} \end{array} \right\}$$

Information structuring constraints are intermingled with phrase structural constraints in the ranking given in (38). This predicts that there will be complicated interactions between the two components of the grammar, i.e. between syntax and discourse. If both CN1 and CN2 were ranked higher than the information structuring constraints, then scrambling would not happen because CANON insists on the canonical order. If the ranking were the reverse, i.e. both information structuring constraints were ranked higher than CN1 and CN2, scrambling would be much freer and the canonical order would be more often ignored, because the information structuring constraints would strongly motivate rearranging the relative order of the constituents according to their information status.¹⁵ The intermingled ranking in (38) implies that in this

¹⁵Certainly, there may be more factors that influence word order. Semantic scope is one. An element which has wider scope tends to precede one with narrow scope (Diesing 1992, 1994). Another factor may be parsing considerations. A long and complicated phrase tends to follow others (Hawkins 1994). Certain factors can block otherwise possible scrambling. Case-marking is such a factor. For

language, no one component of grammar exclusively determines the word order. In this sense, German is different from English, in which it the syntactic component seems to play a dominant role, and is also different from Czech, where it is claimed that the discourse-pragmatic component dominantly determines the order (cf. the Praguean view of word order). In German, scrambling is fairly common, but not unrestricted either.

The ranking predicts several things. In particular, the fact that CN1 is fairly high in ranking predicts that scrambling is much more common among objects than with the subject, which is true in this language. From the perspective of information status, it predicts that topic, which is $[-\text{New}, +\text{Prom}]$ in our system, tends to precede other information types, while completive focus, which is $[\text{+New}, -\text{Prom}]$, tends to follow others and thus to be immediately pre-verbal (i.e. in the last non-verbal position in SOV languages).

Before we discuss the actual data, let me briefly mention the prosodic constraints. As discussed in chapter 3, there is a prosodic requirement on a certain type of information, i.e. $[\text{+New}]$ information. Although there is also a counter-constraint which prevents any element from having a pitch accent, the ranking between them in (40) in German allows all ‘focus’ elements to receive high pitch accents. (See 3.2 in chapter 3 for more discussion.)

(39) Prosodic Constraints:

- a. $[\text{+}\acute{\text{N}}]$: Put a high pitch accent on a new-information element.
- b. $^*\acute{\text{X}}$: Do not place any pitch accent.

(40) Ranking:

$$[\text{+}\acute{\text{N}}] \gg ^*\acute{\text{X}}.$$

example, in Korean, if case-markers (which are optional in the default order) are dropped, scrambling is not possible. One explanation may be that case-marking is the only means to tell grammatical functions apart when the canonical phrase structure is disturbed.

Therefore, this ranking will have the effect of favoring a focused element with a high pitch accent, rather than one without.

In discussing the output representations, we have calculated that there are the 48 different output structures, taking the prosodic variation into account. As seen in the previous section, each scrambled variant has eight (2^3) different prosodic variants. Suppose that the indirect object *dem Schüler* is a focus, i.e. [+New]. The first eight out of 48 outputs are demonstrated in (41).

(41)

	CANDIDATES			[+ \acute{N}]	* \acute{X}
a.	Hans	dem Schüler	das Buch	*	
b.	HANS	dem Schüler	das Buch	*	*
☺c.	Hans	dem SCHÜLER	das Buch		*
d.	Hans	dem Schüler	das BUCH	*	*
e.	HANS	dem SCHÜLER	das Buch		**
f.	HANS	dem Schüler	das BUCH	*	**
g.	Hans	dem SCHÜLER	das BUCH		**
h.	HANS	dem SCHÜLER	das BUCH		***

The first constraint, [+ \acute{N}], requires that the element marked [+New] should have a high pitch accent. Since *dem Schüler* is [+New], the outputs in which *dem Schüler* does not have a high pitch in (41), violate this constraint, i.e. (a), (b), (d), and (f). Since this constraint is ranked higher than the other constraint, * \acute{X} , the four outputs which violate the first constraint are immediately ruled out. The second constraint, in contrast, requires that no element should have a high pitch accent, and thus all but the first candidate (a) violate this constraint. Moreover, the outputs which have more than one stressed element have more than one violation. Now, among the four surviving candidates, i.e. (c), (e), (g), and (h) from the first constraint, the candidate

(c) incurs the fewest violations with respect to the second constraint. Hence, (c) is the optimal output in this context.

Given the ranking between the two prosodic constraints, the optimal output will always be the candidate which has all and only [+New] elements with high pitch accents. Thus, also for the second eight candidates, which have a different constituent order from the first eight, only the one with *dem Schüler* pitch-accented will survive. Likewise, with the remaining 32 candidates. Therefore, the competition boils down to six candidates, i.e. the collection of the output which has the pitch-accented *dem Schüler* from each distinctly-ordered candidate group. The relevant candidates are illustrated in the tableau in (42).

(42)

	CANDIDATES			PROM ...
a.	Hans	dem SCHÜLER	das Buch	
b.	Hans	das Buch	dem SCHÜLER	
c.	dem SCHÜLER	Hans	das Buch	
d.	das Buch	Hans	dem SCHÜLER	
e.	dem SCHÜLER	das Buch	Hans	
f.	das Buch	dem SCHÜLER	Hans	

From now on, for simplicity, we will only consider the six candidates which survive the prosodic variation competition.

4.2 Deriving Semantic/Discourse Effects in Scrambling

Now we have set up the basic groundwork for the OT account of scrambling. Here, scrambled variants are considered to be candidate outputs which compete to be the optimal one for the given input represented in the skeletal f-structure enriched with discourse features. The candidate outputs are evaluated through a set of constraints, both syntactic and discourse-pragmatic. The output which violates the least-highly-ranked constraints is the optimal output.

I will mainly discuss the embedded ditransitive clause which has been introduced earlier in the chapter, i.e., *daß Hans dem Schüler das Buch gegeben hat* ‘that Hans gave the student the book’. Each tableau which follows represents EVAL, i.e. the process of selecting the best output for the given input context, therefore, one tableau per input context. In all the following tableaux, the candidate outputs are the 48 distinct variants differing in both syntactic and prosodic structures as discussed in section 4.1.3, even though I will mostly concentrate on the six distinct orders for the purpose of simplicity. The focused element, whether completive or contrastive, is represented in upper case.

4.2.1 Information Context Types

All-Focus or Neutral Context

Given the information structure with the two features assumed here, i.e. [New] and [Prom], we can expect the following types of informational contexts. First of all, the whole sentence can be delivered unpartitioned. This means that no element of the sentence is either newer or more prominent than any other element. One such case is when a sentence is newly presented in the discourse, which can arise when the

sentence is introduced as an answer to a question like *What happened?*. This is what is often referred to as ‘all-focus’ (Vallduví 1992) or ‘neutral description’ (Kuno 1972). An example context is illustrated in (43).

- (43) a. Was ist passiert?
 what is happened
 ‘What happened?’
- b. Ich glaube daß Hans dem Schüler das Buch gegeben hat.
 I believe that Hans the student(Dat) the book(Acc) given has
 ‘I believe that Hans gave the student the book.’

As shown in (43b), when a sentence is presented as an ‘all-focus’ or ‘neutral description’, it takes the so-called default order. Let us now see how it will be analyzed in the OT account.

In this context, I assume that the sentence as a whole receives the feature marking, i.e. [+New], not each individual element.¹⁶ With respect to the feature [Prom], the input will be marked [−Prom] in a normal situation. If the question *What happened?* is delivered in a very emphatic manner, e.g. with heavy stress on every item, then it will invoke [+Prom] marking in the input for the answer sentence.

¹⁶Alternatively, one could assume that each element is uniformly marked in this situation, all as [+New, −Prom].

(i)

Hans	dem Schüler	das Buch
[+New, −Prom]	[+New, −Prom]	[+New, −Prom]
Focus		

Either way, the tableau will generate the same result because the inputs in (i) and (44) are parallel in the sense that they do not distinguish any one element from another and make the internal elements informationally neutral with respect to each other.

The input the sentence (43b) in this context is given in (44). For ease of exposition, I simply list the non-verbal constituents and put the information-structural feature-markings below each item. Below the feature markings are the information types are labelled, which is given for clarificational purposes.

(44)

Hans	dem Schüler	das Buch
[] _[+New, -Prom]		
Focus		

This input feeds the following EVAL process, expressed in the tableau in (45).

(45)

	CANDIDATES	PROM	CN1	NEW	CN2
☺a.	Hans dem Schüler das Buch				
b.	Hans das Buch dem Schüler				*
c.	dem Schüler Hans das Buch		*		
d.	das Buch Hans dem Schüler		*		*
e.	dem Schüler das Buch Hans		**		
f.	das Buch dem Schüler Hans		**		*

First look at the information structuring constraints, PROM and NEW. As expected, neither constraint applies in this situation. Since no individual element has its own feature marking in the input, which means that they are all neutral with respect to each other, the constraints simply cannot apply. We can interpret this situation as having none of the outputs in (45) violate these constraints, hence no marks for PROM or NEW. In short, unless a difference in the feature marking exists in the input, the information structuring constraints are not important in determining the order among constituents. To put it in other words, as long as the given context confers

the same information status, either by not assigning features to individual elements, or by assigning the same features to all individual elements, the context behaves as if it were ‘neutral’ with respect to word order. In other words, scrambling happens only when there exist informational differences among the component elements.

In the ‘neutral’ context, therefore, the phrase structural constraints CANON alone, CN1 and CN2, determine the best constituent order of the sentence. And this situation is exactly the one where we should expect the ‘unmarked’ or ‘canonical’ order to take place. This prediction is borne out. As we have seen in section 4.1, the first output, where the subject precedes the indirect object, which in turn precedes the direct object, does not violate CN1 or CN2, because it obeys all the subhierarchies between any two elements, as prescribed by the constraints, i.e. [SUBJ–I.OBJ–D.OBJ]. In contrast, the second output (b) incurs one violation mark for CN2 because the direct object *das Buch* precedes the indirect object *dem Schüler*. The output (c), on the other hand, incurs one violation mark for CN1 because here the indirect object *dem Schüler* precedes the subject *Hans*. In (d), the order between the subject and the direct object, and also that between the indirect object and the direct object, are violated, hence there is one mark for CN1, and another for CN2. In (e), the order between the subject and the indirect object, and also that between the subject and the direct object, are violated. In this case, it incurs two marks for CN1. Note that both (b) and (c), and (d) and (e), incur the same number of violations. However, (c) is worse than (b), and (e) is worse than (d), because (c) and (e) involve a greater violation of the higher-ranked constraint CN1. Finally, output (f) incurs three violations, two for CN1 and one for CN2, which is the most severe violation of all. In this output, the order is totally reversed from the canonical order. Therefore, not unexpectedly, the first output (a), which is in the ‘default’ order is chosen as the optimal output in this context.

Ground-Focus Context

The next possible information context is the Ground–Focus type. This usually happens in a normal question and answer pair. The element which corresponds to the question phrase is the focus and the rest is the ground. This is illustrated in (46).

- (46) a. Wem hat Hans das Buch gegeben?
 who(Dat) has Hans the book(Acc) given
 ‘To whom did Hans give a book?’
- b. Ich glaube daß Hans dem SCHÜLER das Buch gegeben hat.
 I believe that Hans the student(Dat) the book(Acc) given has
 ‘I believe that Hans gave the student a book.’
- b’. Ich glaube daß Hans das Buch dem SCHÜLER gegeben hat.
 I believe that Hans the book(Acc) the student(Dat) given has
 ‘I believe that Hans gave the book to the student.’

Since the question is about *wem* ‘who’, the (completive) focus in the sentence (46b) or (46b’) is *dem Schüler* ‘the student’. Therefore, *dem Schüler* is marked [+New] and the rest are marked [–New] in the input. Also, since no element is presented prominently in this context, all elements are marked [–Prom]. This is shown in (47).¹⁷

(47)

Hans	dem Schüler	das Buch
[–New, –Prom]	[+New, –Prom]	[–New, –Prom]
Ground	Focus	Ground

¹⁷It might be also possible that the ground elements together form an informational unit. I do not pursue this possibility in this dissertation. The information unit formation should be subject to certain constraints too, syntactic or other. See the brief discussion in section 3.3 in chapter 3. In what follows, I assume that each element is assigned an individual feature marking unless prohibited by some other constraint. For example, see the discussion of the specificity effect in section 3.4.2 in chapter 3 and 4.2.4 in this chapter.

In this context, the PROM constraint would not play any role because every element has the same status with respect to [Prom]. Therefore, the NEW constraint and CANON together decide the optimal output. The violation patterns for CN1 and CN2 for each output are just like the ones in the tableau for the all-focus example, and it will remain the same for all the other tableaux too, because the violations of the phrase structural constraints are not context-sensitive.

(48)

	CANDIDATES			PM	CN1	NW	CN2
☺a.	Hans	dem SCHÜLER	das Buch			*	
☺b.	Hans	das Buch	dem SCHÜLER				*
c.	dem SCHÜLER	Hans	das Buch		*	**	
d.	das Buch	Hans	dem SCHÜLER		*		*
e.	dem SCHÜLER	das Buch	Hans		**	**	
f.	das Buch	dem SCHÜLER	Hans		**	*	*

Unlike the previous case in which the NEW constraint also was not involved in the optimality decision, this input causes some violations for the NEW constraint. A violation occurs whenever a [+New] element precedes a [−New] element. The first output (a) has one violation mark because the focus *dem Schüler*, which is [+New], precedes *das Buch*, which is [−New]. Likewise, (f) causes one violation mark. In contrast, the second output (b) does not violate this constraint because the [+New] *dem Schüler* is the last element following the other elements. For the same reason, (d) does not violate the constraint either. (c) and (e), on the other hand, have two violations, because the focus *dem Schüler* is in the initial position, preceding two other [−New] elements.

Note that the NEW constraint and CN2 are not ranked with respect to each other, and thus both rankings are possible. Let's first assume that NEW is ranked higher than CN2. This yields (b) as the optimal output.

(49)

	CANDIDATES			PM	CN1	NW	CN2
a.	Hans	dem SCHÜLER	das Buch			*	
☺b.	Hans	das Buch	dem SCHÜLER				*
c.	dem SCHÜLER	Hans	das Buch		*	**	
d.	das Buch	Hans	dem SCHÜLER		*		*
e.	dem SCHÜLER	das Buch	Hans		**	**	
f.	das Buch	dem SCHÜLER	Hans		**	*	*

On the other hand, if the ranking is the reverse, (a) is chosen as the optimal output, as illustrated below.

(50)

	CANDIDATES			PM	CN1	CN2	NW
☺a.	Hans	dem SCHÜLER	das Buch				*
b.	Hans	das Buch	dem SCHÜLER			*	
c.	dem SCHÜLER	Hans	das Buch		*		**
d.	das Buch	Hans	dem SCHÜLER		*	*	
e.	dem SCHÜLER	das Buch	Hans		**		**
f.	das Buch	dem SCHÜLER	Hans		**	*	*

As noted earlier, this result is exactly what needs to be captured. Consider again the question and answer pair discussed earlier, repeated here as (51).

- (51) a. Wem hat Hans das Buch gegeben?
 who(Dat) has Hans the book(Acc) given
 ‘To whom did Hans give a book?’
- b. Ich glaube daß Hans dem SCHÜLER **das Buch** gegeben hat.
 I believe that Hans the student(Dat) the book(Acc) given has
 ‘I believe that Hans gave the student a book.’
- b’. Ich glaube daß Hans **das Buch** dem SCHÜLER gegeben hat.
 I believe that Hans the book(Acc) the student(Dat) given has
 ‘I believe that Hans gave the book to the student.’

It has often been noted in the literature that a question like (51a) invokes two possible answers, differing in order, such as (51b) and (51b’) (Lenerz 1977). This optionality noted in this context is nicely captured in the OT account, given the constraint interaction proposed here.

Topic-Focus-Tail Context

Finally, there are also cases in which some elements are presented more prominently than others. In combination with the distinction in newness, this creates a Topic-Focus-Tail type of information structure. One common way to invoke prominence in discourse is to highlight an element by putting heavy stress on it, or by putting it in a phrase like *what about?* (Vallduví 1992). Consider the following context.

- (52) a. Wie steht’s mit dem Buch? Wem hat Hans das Buch gegeben?
 how stands it with the book who has Hans the book(Acc) given
 ‘What about the book? To whom did Hans give the book?’

b. Ich glaube daß **das Buch** Hans dem SCHÜLER gegeben hat.

I believe that the book(Acc) Hans the student(Dat) given has

‘I believe that Hans gave the book to the student.’

As before, *dem Schüler* is the focus in this context, too, being the phrase which corresponds to the *wh*-word in the question. Unlike the case presented before, however, the direct object *das Buch* is now presented prominently. *Das Buch* receives more attention than other elements in the discourse since the discourse is now set up to talk ‘about’ *das Buch*. Namely, *das Buch* is the topic.¹⁸ This context is represented in the input as follows.

(53)

Hans	dem Schüler	das Buch
[−New, −Prom]	[+New, −Prom]	[−New, +Prom]
Tail	CompFocus	Topic

The indirect object *dem Schüler* is marked [+New], and the subject *Hans* and the direct object *das Buch* are marked [−New]. On the other hand, the object *das Buch* is marked [+Prom], and the rest are marked [−Prom]. Therefore, *das Buch*, which is marked [−New, +Prom], is the topic of the sentence; *dem Schüler*, being marked [+New, −Prom], is the focus, i.e. a completive focus; finally, *Hans* is the tail, marked [−New, −Prom].

This type of input provokes all three constraints to come in to play, because the elements involved are distinct not only in newness but also in prominence. So, the

¹⁸As mentioned earlier, some speakers do not like the order in which the subject is preceded by some other element in the sentence. In that case, CN1 is ranked higher than PROM. One more source of unacceptability may be the way in which a speaker classifies the discourse context. Speakers can vary in their judgments of the given context. That is, if the speaker does not consider *das Buch* in (52) to be ‘prominent’ enough in that context, she/he would not mark *das Buch* as [+Prom], and then *das Buch* would not be able to scramble. Hence, the order in (52b) is not possible for such speakers. For more discussion of speaker variation, see section 4.2.4.

PROM constraint also does its job.

(54)

	CANDIDATES			PROM	CN1	NEW	CN2
a.	Hans	SCHÜLER	das Buch	**		*	
b.	Hans	das Buch	SCHÜLER	*			*
c.	SCHÜLER	Hans	das Buch	**	*	**	
d.	das Buch	Hans	SCHÜLER		*		*
e.	SCHÜLER	das Buch	Hans	*	**	**	
f.	das Buch	SCHÜLER	Hans		**	*	*

Remember that the information structuring constraint [Prom] demands that a [+Prom] element precede a [-Prom] element. Since the direct object *das Buch* is [+Prom] in this context, it should precede all other elements. Hence, any order in which *das Buch* is not in the first position violates this constraint: (b) and (e) incur one violation and (a) and (c) incur two violations. Since PROM is the highest constraint of all, the choice is narrowed down to (d) and (e). With respect to the next highest constraint, i.e. CN1, (d) evokes one violation, and (e) evokes two. Hence, (54d) is the optimal output.

In (54), the direct object, as a topic, scrambles all the way to the initial position. Recall that topic is the most scramblable information type because it is simultaneously [-New] and [+Prom]. Thus, both the NEW constraint and the PROM constraint facilitate its scrambling. Notice the contrast in *das Buch*'s scramblability between (51) and (52). As a tail in (51), it cannot scramble over the subject, but as a topic in (52), it can. Also, note that while it can stay in situ as a tail in (51), the direct object necessarily scrambles as a topic. (See section 3.2.2 in chapter 3 for discussion of the differences between topic and tail.)

Let us now see how this OT account of scrambling captures the pragmatic and semantic effects which have been discussed in chapter 3. These effects have been identified as the anti-focus effect, the specificity effect, and the contrastive focus effect. It will be shown in the sections that follow that once scrambling is viewed as the process of optimizing structure for a given context, these effects naturally follow from the theory without special arrangements. Also, the ‘subject’ effect in scrambling, i.e., that a subject is much harder to scramble over than other elements are, is naturally captured by the high ranking of CN1.

4.2.2 Anti-Focus Effect

We have seen in the previous section that a certain question context, i.e., one in which the indirect object is in question, generates two possible answers, one in the canonical order and the other in a scrambled order (repeated here in (55)). However, this optionality does not always happen (Lenerz 1977). The question context illustrated below in (56), allows only the canonically-ordered sentence as the possible answer, as shown in (56b), but disallows a scrambled one, as in (55b’). Compare (55) and (56).

- (55) a. Wem hat Hans das Buch gegeben?
 who(Dat) has Hans the book(Acc) given
 ‘To whom did Hans give a book?’
- b. Ich glaube daß Hans dem SCHÜLER das Buch gegeben hat.
 I believe that Hans the student(Dat) the book(Acc) given has
 ‘I believe that Hans gave the student a book.’
- b’. Ich glaube daß Hans das Buch dem SCHÜLER gegeben hat.
 I believe that Hans the book(Acc) the student(Dat) given has
 ‘I believe that Hans gave the book to the student.’

- (56) a. Was hat Hans dem Schüler gegeben?
 what(Acc) has Hans the student(Dat) given
 ‘What did Hans give to the student?’
- b. Ich glaube daß Hans dem Schüler das BUCH gegeben hat.
 I believe that Hans the student(Dat) the book(Acc) has
 ‘I believe that Hans gave the student the book.’
- b’. *Ich glaube daß Hans das BUCH dem Schüler gegeben hat.
 I believe that Hans the book(Acc) the student(Dat) given has
 ‘I believe that Hans gave the book to the student.’

The difference between (55) and (56) lies in that the scrambled element in (55b) is a non-focused phrase whereas the one in (56b) is a focused one. Thus, it has been proposed in the literature as a constraining condition on scrambling that ‘a focused element cannot scramble’ (Lenerz 1977, Abraham 1986, Moltmann 1990, Webelhuth 1992). This is what I called the ‘anti-focus’ effect in chapter 3.

Let us examine how the OT account proposed here explains this phenomenon. It is accounted for in a fairly straightforward manner in this framework. Not unexpectedly, the NEW constraint can easily handle this problem. Consider first the input representation for (56).

(57)

Hans	dem Schüler	das Buch
[−New, −Prom]	[−New, −Prom]	[+New, −Prom]
Ground		CompFocus

Just as in the previous question and answer pair, the element which corresponds to the question word is the focus of the sentence, hence marked [+New] in the input. The direct object *das Buch* ‘the book’ is [+New] in this context. Then, the subject *Hans*

and the indirect object *dem Schüler* are marked [−New]. With no other contextual clues, no elements are assumed to be prominent. Therefore, all elements are marked [−Prom].

This input provides the tableau in (58). Just as in the previous case, only the six outputs which have survived the prosodic constraints are listed in the tableau. Thus, the focus *das Buch* has a high pitch accent in all the outputs in (58).

(58)

	CANDIDATES			PROM	CN1	NEW	CN2
☺a.	Hans	dem Schüler	das BUCH				
b.	Hans	das BUCH	dem Schüler			*	*
c.	dem Schüler	Hans	das BUCH		*		
d.	das BUCH	Hans	dem Schüler		*	**	*
e.	dem Schüler	das BUCH	Hans		**	*	
f.	das BUCH	dem Schüler	Hans		**	**	*

The PROM constraint does not apply in this case because all the elements are marked [−Prom]. Therefore, the decision is to be made by the interaction between the NEW constraint and CANON. CN1, which is higher than CN2 and the NEW constraint, quite easily narrows down the choice to (a) and (b), because all the others violate this high constraint, and thus are quickly eliminated from the competition. Since *das Buch* is [+New] here, the NEW constraint demands that it follow other elements. Therefore, the outputs where *das Buch* is not preceded by the other elements violate this constraint. Between (a) and (b), (b) is discarded because here the [+New] element, *das Buch*, precedes a [−New] element, *dem Schüler*, causing a violation of the NEW constraint. Therefore, (a) is the optimal output. That is, this context chooses (a) as the only optimal output, and only this output is grammatical in this context. This result matches the fact that the question context in (56) has only one possible answer.

It would be interesting at this point to compare the tableau here with that in the previous case which has two optimal outputs, i.e. for (55). Candidates (a) and (b) are repeated below from each tableau: (59a) and (59b) are extracted from (58), and (59a') and (59b') are from (48) in the previous section.

(59)

	CANDIDATES	PROM	CN1	NEW	CN2
☺a.	Hans dem Schüler das BUCH				
b.	Hans das BUCH dem Schüler			*	*
☺a'.	Hans dem SCHÜLER das Buch			*	
☺b'.	Hans das Buch dem SCHÜLER				*

In the first case, i.e. (a) and (b), (a) is definitely the best choice. In (a), which is in the default order, the [+New] element *das Buch* is already in the final position of all the elements, hence not violating the NEW constraint. Moreover, this is the only candidate that does not violate the phrase structural constraint CANON either. So, the canonically-ordered sentence is free of violation in this context. In contrast, the candidate (b) violates both the NEW constraint and CN2. In this order, *das Buch* is scrambled over *dem Schüler* and therefore not only disturbs the canonical order of the sentence, but also disobeys the desirable order between old and new elements. Hence, this context definitely chooses candidate (a) over candidate (b) as the ‘optimal’ output, thus giving us only one grammatical output.

In comparison, the choice is not as clear in the second case. In the candidate (a') in the default order, the [+New] element *dem Schüler* is not in the last position, preceding the [−New] element *das Buch*, and thus violating the NEW constraint. However, the candidate (b') does not violate the NEW constraint by scrambling the [−New] element over the [+New] element, i.e. *das Buch* over *dem Schüler*. In other words, scrambling saves this candidate from violating the information structuring constraint

[New], although it forces it into violating the phrase structural constraint CN2. Interestingly, the scrambling candidate (b') still survives because in this grammar, the information-structuring NEW constraint is ranked in a tie with the phrase structural constraint CN2. This is why we can have two 'grammatical' outputs in this context.

4.2.3 Contrastive Focus Effect

So far, we have considered contexts which invoke purely new-information type of focus, i.e. completive focus. This is a nonprominent focus, i.e. the focus which is marked [+New, -Prom] in our system. However, our system also allows for 'prominent' focus, i.e. that of [+New, +Prom], which I have labeled contrastive focus in chapter 3. What is interesting about this information type is that one part of it, i.e. [+New], encourages it to *follow* other elements, while the other part, i.e. [+Prom], encourages it to *precede* them. In a sense, the information structure of this discourse function contains an internal conflict. Let's see how this conflict is resolved in what follows.

A contrastive focus can be evoked in several different contexts. Simply stressing the question word, such as in *WAS hat Hans dem Schüler gegeben?* 'WHAT did Hans give to the student?', may suffice to make the focus 'prominent', i.e. contrastive. Alternatively, as Dik et al. (1981) illustrate, one of the 'contrastive' contexts, i.e. selecting, expanding, restricting, replacing, and parallel, may facilitate making focus 'prominent' by means of evoking relevant sets of alternatives (see 3.1.3 in chapter 3 for more discussion).

For instance, a replacing context such as in (60) will grant 'prominence' to the focused element *das Buch* 'the book' in the answer, by comparing it with an alternative, i.e. *die Zeitung* 'the newspaper'. In this case, the focused phrase can scramble.

- (60) a. Was hat Hans dem Schüler gegeben? die Zeitung?
 what has Hans the student(Dat) given the newspaper
 ‘What did Hans give to the student? The newspaper?’
- b. Ich glaube daß Hans das BUCH dem Schüler gegeben hat
 I believe that Hans the book the student given has
 (nicht die ZEITUNG).
 not the newspaper
 ‘I believe that Hans gave the book to the student (not the newspaper).’

As argued in chapter 3, a contrastive focus is represented as [+New,+Prom] in the input, i.e. as prominent new information. Therefore, for the above context, the input will be marked as follows.¹⁹

(61)

Hans	dem Schüler	das Buch
[−New,+Prom]	[−New,−Prom]	[+New,+Prom]
Topic	Tail	ContFocus

As mentioned above, a contrastive focus is a very puzzling case because while its newness ([+New]) discourages it from scrambling, its prominence ([+Prom]) encourages it to do so, given the information structuring constraints proposed in this chapter. As expected, [+Prom] wins, and thus the focused phrase scrambles, because the PROM constraint outranks the NEW constraint in this language. This is illustrated in the tableau in (62).

¹⁹Note that the subject *Hans* is also marked [+Prom]. I assume that unlike other elements of the sentence, the subject can easily be the topic of the sentence even without a high pitch or being presented in the *what about* phrase. In other words, unless something else is presented as the topic, subject tends to be assigned [+Prom] although [−Prom] is also an option. From now on, I will only consider cases where the subject is the topic of the sentence.

(62)

	CANDIDATES			PROM	CN1	NEW	CN2
a.	Hans	dem Schüler	das BUCH	*			
b.	Hans	das BUCH	dem Schüler			*	*
c.	dem Schüler	Hans	das BUCH	**	*		
d.	das BUCH	Hans	dem Schüler		*	**	*
e.	dem Schüler	das BUCH	Hans	**	**	*	
f.	das BUCH	dem Schüler	Hans	*	**	**	*

Since *das Buch* is a prominent element, the PROM constraint instructs it to scramble and thereby to precede all non-prominent elements of the sentence. However, by doing so, it will violate the [New] constraint. Compare (62b) and (62d). Neither violates the PROM constraint. If *das Buch* scrambles over the subject *Hans* as in (62d), however, it not only adds another mark to the NEW constraint, but also violates CN1. On the other hand, if it stops in the middle as a compromise, it does not violate the higher constraint CN1. Therefore, the optimal case would be the one in which *das Buch* scrambles over *dem Schüler*, but not over *Hans*. This result indeed obtains as confirmed in (60) (Lenerz 1977, Moltmann 1990).²⁰

Compare this contrastive focus case with the topic case discussed in the previous subsection. There, we have seen the direct object scramble over the subject. This fact confirms our initial prediction that topic is the most scramblable entity. It should be noted also that I do not claim that in all cases where a direct object is the contrastive focus, should it scramble over an indirect object. It scrambles over the indirect object only when it is more prominent than the latter. If the indirect object were also prominent, then the direct object would not be motivated to scramble, and actually would be punished by CANON if it did. When that is the case, then the

²⁰Many speakers find (a) still pretty good in this context. Speaker variation is briefly discussed later in this section.

contrastively focused phrase also stays in its canonical position.

4.2.4 Specificity Effect

We have considered the scrambling of definite phrases so far. As often noted, however, indefinite phrases, or ‘weak’ phrases, do not necessarily behave like definite or ‘strong’ phrases. As discussed in chapter 3, a weak phrase cannot scramble (Lenerz 1977, Abraham 1986, Moltmann 1990, de Hoop 1992, Diesing 1992, Webelhuth 1992), which has been referred to as the ‘specificity’ effect in chapter 3. It has also been noted that an exception exists to the specificity effect, which occurs when contrastive focus is involved (Lenerz 1977, Abraham 1986, Moltmann 1990). I devote this section to discussing the problems related to indefinite phrases.

A Non-Specific Phrase as Completive Focus

If a non-specific indefinite phrase is introduced in the discourse as a completive focus, i.e. as non-prominent new information, it behaves just like a definite phrase. First consider the following context.

(63) a. Was hat Hans dem Schüler gegeben?

what(Acc) has Hans the student(Dat) given

‘What did Hans give to the student?’

b. Ich glaube daß Hans dem Schüler ein BUCH gegeben hat.

I believe that Hans the student(Dat) a book(Acc) given has

‘I believe that Hans gave the student a book.’

The indefinite phrase *ein Buch* ‘a book’ in (63b) is introduced as an answer to the question phrase *was* ‘what’ in (63a). Since there is no sign that it is prominent, *ein*

Buch is a completive focus, hence marked [+New, -Prom].²¹

(64)

Hans	dem Schüler	ein Buch
[-New,+Prom]	[-New,-Prom]	[+New,-Prom]
Topic	Tail	CompFocus

Now, since other elements are old information in this context, as illustrated in the input (64), then we can easily predict that the focus will follow all other elements. Undoubtedly, this prediction is borne out. This is illustrated in the tableau in (65).

(65)

	CANDIDATES			PROM	CN1	NEW	CN2
☺a.	Hans	dem Schüler	ein BUCH				
b.	Hans	ein BUCH	dem Schüler			*	*
c.	dem Schüler	Hans	ein BUCH	*	*		
d.	ein BUCH	Hans	dem Schüler	*	*	**	*
e.	dem Schüler	ein BUCH	Hans	**	**	*	
f.	ein BUCH	dem Schüler	Hans	**	**	**	*

The information structuring constraint PROM and the phrase structural constraint CN1 immediately rule out all outputs where the subject is scrambled over. Therefore, the competition is between (a) and (b). The second constraint, [New], now checks if the focus, *ein Buch*, is followed by any [-New] element, and marks any candidate

²¹Briefly recall the discussion in section 3.3 and 3.4 in chapter 3 that the feature marking in the input is also not unrestricted. Especially, nonspecific indefinite NPs are restrained from having the [-New] feature as shown in (64b).

- (i) SPECIFICITY:
 - a. SP1: A specific phrase should not be [+New].
 - b. SP2: A nonspecific phrase should not be [-New].

However, this constraint does not apply in this case because the context assigns [+New] to the indefinite NP *ein Buch* in (62).

in which it is. Candidate (a) and candidate (c) survive this constraint: they are the only candidates where the [+New] element, *ein Buch*, follows all [−New] elements. Therefore, naturally, (a) comes out as the optimal output since it does not violate CN2 as well, while (b) does. In short, when interpreted as completive focus, a non-specific indefinite phrase is expected to stay in its canonical position just as a specific phrase does. Therefore, the completive focus context does not cause a problem since it does not motivate a non-specific phrase to scramble.

If the indirect object is the topic, then it may affect the relative order between the subject and the indirect object itself, but it would not change the fact that the focused direct object *ein Buch* should stay in its canonical position. Given the constraints introduced in this chapter, a completely focused direct object, specific or not, always has to stay in its canonical position, because: first, neither of the information structuring constraints, [New] or [Prom] would motivate it to scramble, since the completive focus gets the weakest marking in terms of scramblability, i.e. [+New, −Prom]; second, the CANON constraint, CN2, would always prefer it (actually, anything) to stay in the canonical position.

It is notable that the present OT account has the interesting consequence that it has the option to allow the immediate pre-verbal element to be interpreted as focus. Due to the NEW constraint, the focus element tends to be positioned as the rightmost element of the non-verbal elements, and the rightmost position is the pre-verbal position in an SOV language like German or Korean. Not surprisingly, several people have proposed that the pre-verbal position is the focus position in these languages (Krifka 1995, Kim 1985, Jo 1986) following Szabolcsi (1981) and Kiss (1981). So, the focused phrase is either base-generated or moved to the preverbal position in these analyses. Reinhart (1995) makes a slightly different proposal: that a non-focused

element moves or scrambles to allow the left-over element to be focused.²² Our NEW constraint can capture this intuition.

However, focus is not necessarily immediately pre-verbal. It can stay in the element's canonical position. This is shown in (66). This is also true with definite NPs, as we have seen above.

- (66) a. Wem hat Hans das Buch gegeben?
 who(Dat) has Hans the book(Acc) given
 'To whom did Hans give the book?'
- b. Ich glaube daß Hans einem SCHÜLER das Buch gegeben hat.
 I believe that Hans a student(Dat) the book given has
 'I believe that Hans gave a student the book.'
- b'. Ich glaube daß Hans das Buch einem SCHÜLER gegeben hat.
 I believe that Hans the book a student(Dat) given has
 'I believe that Hans gave the book to a student.'

The current proposal explains this optionality of focus generation by the interaction between the NEW constraint and CANON: [New] motivates focus to be pre-verbal while CANON encourages it to remain in situ. Therefore, our proposal has an advantage over the pre-verbal focus accounts in that while it can certainly accommodate the observation that focus tends to be generated pre-verbally, it also allows it to be generated in the element's canonical position.

²²She actually argues that the object in Dutch scrambles to make the *verb* focused. This is not necessarily true: a non-verbal element, e.g. argument or adjunct, can also be focused (excluding the verb from its focus domain) if the object scrambles over it.

A Non-Specific Phrase as Old Information?

A problem arises when a non-specific phrase is *not* introduced in the discourse as a focus or ‘new’ information. One such context is when the focus of the sentence falls on some other element so that an indefinite NP is forced to be interpreted as a tail-like element. This is illustrated in (67).

- (67) a. Wem hat Hans ein Buch gegeben?
 who(Dat) has Hans a book(Acc) given
 ‘To whom did Hans give a book?’
- b. Ich glaube daß Hans dem SCHÜLER ein Buch gegeben hat.
 I believe that Hans the student(Dat) a book given has
 ‘I believe that Hans gave the student a book.’
- b’. *Ich glaube daß Hans ein Buch dem SCHÜLER gegeben hat.
 I believe that Hans a book the student(Dat) given has
 ‘I believe that Hans gave a book to the student.’

Here, the indirect object *dem Schüler* is the focus, i.e. [+New], and thus, the non-specific indefinite NP *ein Buch*, along with the subject *Hans*, is not interpreted as [+New]. What is it then? If it really were a tail, and hence marked [–New], then it should be able to scramble just as a specific [–New] element can. However, this is not the case, as shown in (67). This is what has been called the ‘specificity’ effect of scrambling.

Recall the discussion in section 3.4 in chapter 3, where it was argued that the specificity effect in scrambling should be handled by the semantics–discourse/pragmatics mapping principles, which constrain the feature marking in the input, rather than the syntax-semantics ones (cf. de Hoop 1992, Diesing 1992, 1994). Based on the observation that a nonspecific indefinite NP usually introduces a new entity into

the discourse, while a specific indefinite NP refers to an entity which is already existent in the discourse (cf. Heim 1982, Enç 1991, Webelhuth 1992), I proposed the SPECIFICITY constraints, which are basically responsible for the linking between the semantic notion of specificity and the pragmatic notion of discourse-oldness or discourse-familiarity, and thus control the feature assignment of the relevant phrases in the input.

(68) SPECIFICITY:

- a. SP1: A specific phrase should not be [+New].
- b. SP2: A nonspecific phrase should not be [−New].

I have further argued that the first constraint SP1 can be violated while the second constraint SP2 cannot. Namely, a specific phrase can be interpreted as a ‘new’ ([+New]) entity if it is forced to by the context. One such context is when it is interpreted as a focus as in (69).

- (69) a. Was hat Hans dem Schüler gegeben?
 what(Acc) has Hans the student(Dat) given
 ‘What did Hans give to the student?’
- b. Ich glaube daß Hans dem Schüler das BUCH gegeben hat.
 I believe that Hans the student(Dat) the book(Acc) has
 ‘I believe that Hans gave the student the book.’

The specific NP *das Buch* here is interpreted as if it were a newly-introduced entity although it has been referentially-anchored in the discourse. That is why it is represented as a definite NP rather than an indefinite NP. This temporary ‘newness’ is achieved by its capability of violating the SPECIFICITY constraint SP1. See 3.4 for detailed discussion of this problem (cf. Diesing 1994, Vallduví 1992).

In contrast, a nonspecific indefinite NP cannot really be interpreted as an ‘old’ entity by itself. As shown in (70), if a nonspecific NP fails to be referentially anchored (usually by being replaced by a definite NP or a pronoun as in (70b)) after its initial introduction into the discourse, it is not interpreted as an independent ‘entity’ any more, but rather behaves as if it were part of the predicate (de Hoop 1992).

- (70) a. I bought a book.
 b. Where did you buy it/the book?
 b'. Where did you buy a book?

That is, if a nonspecific NP is forced to be interpreted as a [–New] entity, which it cannot because of the SP2 constraint, it constitutes another information unit with the predicate. By being part of the larger unit, it avoids the problem of being assigned the [–New] feature as an individual, although the larger unit is assigned [–New]. In other words, a nonspecific NP has an independent life in the discourse only as a ‘new’ entity, but once it has lost its ‘newness’, it loses its independence too.

As noted in the previous chapter, these constraints differ from other constraints we have seen so far (e.g. CANON, PROM, and NEW) in that they are not concerned with the mapping between inputs and outputs, but rather are concerned with the mapping within input markings. In other words, a nonspecific NP cannot have a [–New] marking in the input due to its inherent semantic incompatibility with this discourse property ([–New]), whereas a specific NP may have a [+New] marking in the input. Again, this distinction depends on the constraint strength.

Therefore, in a context like (71), the nonspecific NP *ein Buch* is not marked with any discourse features, as illustrated in (72).

- (71) a. Wem hat Hans ein Buch gegeben?
 who(Dat) has Hans a book(Acc) given
 ‘To whom did Hans give a book?’

b. Ich glaube daß Hans dem SCHÜLER ein Buch gegeben hat.

I believe that Hans the student(Dat) a book given has
 ‘I believe that Hans gave the student a book.’

b’. *Ich glaube daß Hans ein Buch dem SCHÜLER gegeben hat.

I believe that Hans a book the student(Dat) given has
 ‘I believe that Hans gave a book to the student.’

(72)

Hans	dem Schüler	ein Buch
[−New,+Prom]	[+New,−Prom]	[]
Topic	CompFocus	

Note that *ein Buch* is not assigned a [Prom] feature either. It follows from the fact that the NP is now part of a larger information unit, and thus cannot be assigned any feature individually. This predicts that a nonspecific indefinite NP cannot be interpreted as a topic either. This seems to be a desirable result. For example, a nonspecific NP cannot be put in a *what about* phrase unless it is interpreted as generic or specific, as shown in (73).

(73) # What about a book?

(74)

	CANDIDATES			PROM	CN1	NEW	CN2
☺a.	Hans	dem Schüler	ein BUCH				
b.	Hans	ein BUCH	dem Schüler				*
c.	dem Schüler	Hans	ein BUCH	*	*	*	
d.	ein BUCH	Hans	dem Schüler	*	*		*
e.	dem Schüler	ein BUCH	Hans	**	**	*	
f.	ein BUCH	dem Schüler	Hans	**	**	*	*

Now, since *ein Buch* is not marked [$-New$], it does not violate the NEW constraint even if it follows the [$+New$] element, *dem Schüler*. Therefore, it is not restricted with respect to the NEW constraint. However, the phrase structural constraints CANON forbid it to be out of its canonical position. In other words, no element can scramble out of its canonical position unless it has an individual feature assignment. Consequently, the first output, the canonically ordered one, is the optimal output. And this is why the scrambled variant in (71b) is bad.

A Non-Specific Phrase as Contrastive Focus

Finally, consider what happens if a nonspecific phrase is a contrastive focus. Just as in the definite NP cases, a context like (75), i.e. a replacing context, provokes a contrastive focus (see section 4.2.3 for more discussion on contrastive focus). Interestingly, in this case, a nonspecific indefinite phrase such as *ein Buch* can scramble.

- (75) a. Was hat Hans dem Schüler gegeben? eine Zeitung?
 what has Hans the student(Dat) given a newspaper
 ‘What did Hans give to the student? A newspaper?’
- b. Ich glaube daß Hans ein BUCH dem Schüler gegeben hat
 I believe that Hans a book the student given has
 (nicht eine ZEITUNG).
 not a newspaper
 ‘I believe that Hans gave a book to the student (not a newspaper).’

Recall that this has been the most troublesome case for previous analyses which are either based on specificity (de Hoop 1992, Diesing 1992) or on focality (Lenerz 1977, Webelhuth 1992) (see chapter 3 for detailed discussion). This case runs against both of these accounts, i.e., ‘a scrambled phrase should be specific’, or ‘a scrambled

phrase should be unfocused’, because the indefinite NP *ein Buch* in (75) is neither specific nor unfocused.

In the current account, this is not a special case. Just like the definite phrase, the indefinite NP *ein Buch* is marked [+New,+Prom] since it is contrastively focused in this context.

(76)

Hans	dem Schüler	ein Buch
[−New,+Prom]	[−New,−Prom]	[+New,+Prom]
Topic	Tail	ContFocus

The nonspecific phrase *ein Buch*, being [+New] now, is not constrained by the SPECIFICITY constraint. Remember that the SPECIFICITY constraint only controls the cases where a nonspecific phrase is marked [−New].

(77)

	CANDIDATES			PROM	CN1	NEW	CN2
a.	Hans	dem Schüler	ein BUCH	*			
☺b.	Hans	ein BUCH	dem Schüler			*	*
c.	dem Schüler	Hans	ein BUCH	**	*		
d.	ein BUCH	Hans	dem Schüler		*	**	*
e.	dem Schüler	ein BUCH	Hans	**	**	*	
f.	ein BUCH	dem Schüler	Hans	*	**	**	*

The PROM constraint narrows down the competition to between (b) and (d). Because (d) violates the CN1 constraint, however, (b) is the optimal output. And this explains the problematic contrastive focus case. The nonspecific NP *ein Buch* maintains its [+New] marking (because it is not restricted by the SPECIFICITY constraint), and as a [+Prom] element, it can be scrambled.

Speaker Variation

Before closing this section, let me briefly add a few words about speaker variation in the acceptability of scrambled sentences. Not surprisingly, not all speakers readily accept using the scrambled order in contrastive focus contexts such as in (75). Also, not all contrastive contexts are conceived of as equally ‘contrastive’. That is, some speakers consider a certain context more contrastive than others. I have argued in chapter 3 that so-called focus adverbs such as *nur* ‘only’ or *sogar* ‘even’ trigger a contrastive focus context by ‘restricting’ or ‘expanding’ the set of alternatives (Dik et al. 1981). The examples are illustrated in (78).

- (78) a. weil Hans NUR ein BUCH dem Mann gegeben hat
 because Hans only a book(Acc) the man(Dat) given has
 ‘because Hans gave only a book to the man’
- b. weil Hans SOGAR ein BUCH dem Mann gegeben hat
 because Hans even a book(Acc) the man(Dat) given has
 ‘because Hans gave even a book to the man’

Although many people accept both (79a) and (79b) equally, some prefer (79a) to (79b), or vice versa.

Likewise, in the same environment, e.g. in a ‘replacing’ context, some people would accept the scrambled order as in (79b), but others would not like it as much.

- (79) a. weil Hans dem Schüler ein BUCH gegeben hat (nicht eine ZEITUNG)
 because Hans the student a book given has not a newspaper
 ‘because Hans gave a book to the student (not a newspaper)’
- b. weil Hans ein BUCH dem Schüler gegeben hat (nicht eine ZEITUNG)
 because Hans a book the student given has not a newspaper
 ‘because Hans gave a book to the student (not a newspaper)’

It may be because to those speakers, this context is not contrastive enough, or the focused element, e.g. *ein Buch*, is not prominent enough. Naturally speakers can vary in their judgments of the context. However, it is remarkable that almost all speakers agree that the scrambled NPs in (78) and (79) are certainly more contrastive or more prominent than the in-situ counterparts.

Therefore, I argue that speaker variation arises because there are differences in how speakers perceive a context or the informational status of an element. That is, it is up to speaker's judgment whether a certain context is contrastive or not, or whether a certain element is prominent enough or not. For example, one can perceive that a 'restricting' context is contrastive while an 'expanding' context is not, or vice versa. Likewise, with a 'replacing' context. Some could see the context for (79) as not contrastive at all, while others may perceive it as contrastive even without the overt replacing phrase *nicht eine Zeitung*. In particular, 'prominence' seems more likely to be subject to speaker variation than 'newness'. It seems quite plausible that the prominence judgment would be more subjective than the newness judgment. However, once a speaker judges a certain context as contrastive or an element as prominent, then she/he will accept the scrambled sentences. Therefore, I claim that speaker variation occurs because speakers can vary in classifying the context, and thus code the input differently, not because the mapping from inputs to outputs varies.

4.3 Summary

This chapter has explored what kinds of principles motivate and also restrict scrambling, in terms of Optimality Theory. Using the feature-based information structure developed in chapter 3 as the major part of input representation, I have argued that each scrambled variant is the best structural description of a particular discourse-contextual information in the input. I have proposed that the mapping from each

input to its optimal output in scrambling is constrained by a relatively small number of syntactic and discourse-contextual constraints, i.e. CN1, CN2, PROM and NEW, which will be further restrained by the semantic constraints SPECIFICITY on the feature marking in the input representation. I proposed the following ranking for the German scrambling phenomena.

(80) Constraint Ranking (German):

$$\text{PROM} \gg \text{CN1} \gg \left\{ \begin{array}{l} \text{NEW} \\ \text{CN2} \end{array} \right\}$$

In addition to having captured the often-observed semantic and discourse effects associated with scrambling, such as the specificity, anti-focus, and contrastive focus effects, reported in the literature, the OT analysis proposed in this chapter predicts the following generalizations.

- (81) a. An element in its canonical position can be any of the four information types, i.e. topic, tail, contrastive focus, or completive focus.
- b. A topic ($[-\text{New}, +\text{Prom}]$) is never scrambled over by other elements.
- c. A completive focus ($[+\text{New}, -\text{Prom}]$) never scrambles, i.e., a scrambled element cannot be a completive focus.
- d. A nonspecific element can scramble only as a contrastive focus.
- e. The subject in German is hard to scramble over because the phrase structural constraint CN1 is a strong constraint.

Although they require more thorough testing, the generalizations in (81) seem to match native speakers' intuitions.

Chapter 5

Order and Morphology: Korean

We have observed in chapter 3 and chapter 4 that scrambling, i.e., the reordering of constituents of a sentence out of their canonical positions, is a major resource for encoding information structure in German. In particular, scrambling is argued to be motivated by two information structuring constraints: one is the NEW constraint, which motivates a $[-\text{New}]$ element to precede a $[\text{+New}]$ element; the other is the PROM constraint, which impels a $[\text{+Prom}]$ element to precede a $[-\text{Prom}]$ element (see chapter 3 for the motivations for these information structuring constraints).

This chapter examines scrambling phenomena in Korean also from the perspective of information structuring. It is argued that scrambling in Korean is also motivated and constrained by the interaction of the information structuring constraints (developed in chapter 3) and the phrase structural constraints (motivated in chapter 2). Specifically, special attention is paid to the difference in information encoding between the scrambling of regularly case-marked phrases and that of phrases marked with the so-called topic marker *nun*. It will be shown that the difference results from the interaction between constituent order and morphological marking.

5.1 Information Structuring by Morphology

5.1.1 *nun*: Topic or Contrastive Focus?

Topichood in Korean is traditionally believed to be encoded by morphology, i.e. by the so-called topic marker *nun* (cf. *wa* in Japanese). For example, unlike the regular nominative case marker *ka*, which does not in itself endow a subject phrase with any special information status,¹ the “topic” marker *nun* makes a phrase the ‘topic’ of the sentence. This contrast is exemplified in (1).

- (1) a. Swuni-**ka** Inho-lul manna-ss-ta.
 Swuni-Nom Inho-Acc meet-Pst-Dcl
 ‘Swuni met Inho.’ [neutral]
- b. Swuni-**nun** Inho-lul manna-ss-ta.
 Swuni-Top Inho-Acc meet-Pst-Dcl
 ‘As for Swuni, she met Inho.’ [topic]

The subject phrase *Swuni*, marked with *ka* in (1a), is ‘neutral’ in the sense that it is not informationally restricted (in this default configuration): it can be interpreted as new or old, prominent or nonprominent information, depending on the context. In the information structure proposed in this thesis, this means that the *ka*-phrase can be marked [+New] or [−New], and [+Prom] or [−Prom].² On the other hand, the subject phrase in (1b), which is marked with the so-called topic marker *nun*,

¹The information status of a regularly case-marked phrase will be determined by its relative position in the sentence, as will be shown below.

²Analogous to its Japanese counterpart *ga* (Kuno 1972, 1973), it has been proposed that *ka* in Korean also induces only ‘new’-information readings, i.e., a ‘neutral description’ reading or an ‘exhaustive listing’ reading (cf. a ‘neutral’ or ‘focus’ reading in Kim (1990)): the ‘neutral description’ reading is analogous to our completive focus and the ‘exhaustive listing’ to our contrastive focus. As we will see below, however, a *ka*-phrase can also encode ‘old’ information, which distinguishes it from the Japanese counterpart *ga* (see Haig (1982) for a comparative discussion of the Korean and Japanese subject phrases).

is interpreted as the ‘topic’ or ‘theme’ (Kuno 1972) of the sentence. The subject *Swuni* here is presented as a distinct entity from the rest of the sentence: it is what the sentence is about, and what the rest of the sentence is commenting on. In the currently assumed information structure, *Swuni* is marked [−New,+Prom].

The informational restrictedness of a *nun*-phrase comes out in a context such as the one below. In a ‘neutral description’ (Kuno 1972, 1973) or an ‘all-focus’ (Vallduví 1992) context as in (2), i.e., one which requires that all elements of the sentence be equally presented as new information, only the *ka*-marked subject, as in (2b), but not the *nun*-marked subject, as in (2b’), is allowed.

- (2) a. ecey mwusun il-i iss-ess-ni?
 yesterday what event-Nom be-Pst-Int
 ‘What happened yesterday?’
- b. Swuni-**ka** Inho-lul manna-ss-ta.
 Swuni-Nom Inho-Acc meet-Pst-Dcl
 ‘Swuni met Inho.’ [neutral]
- b’. *Swuni-**nun** Inho-lul manna-ss-ta.
 Swuni-Top Inho-Acc meet-Pst-Dcl
 ‘As for Swuni, she met Inho.’ [topic]

The *nun* marking in (2b’), in contrast to the regular case marking in (2b), makes the subject phrase *Swuni-nun* stand out as old and prominent information among other elements of the sentence, and partitions the sentence as such; so an ‘all-focus’ context, which requires equal information status for all elements of the sentence, would not allow a *nun*-phrase in it. The subject *ka*-phrase, *Swuni-ka* here, is allowed in this context because it is not informationally restricted in this default configuration.

The following context shows that *nun* as a topic marker is not compatible with a tail element either, which is old, but not prominent information.

- (3) a. *ecey*-*nun*? Swuni-*ka* *ecey* nwukwu-lul *man*-*ss*-*ni*?
 yesterday-Top Swuni-Nom yesterday who-Acc meet-Pst-Int
 ‘What about yesterday? Who did Swuni meet yesterday?’
- b. Swuni-**ka** Inho-lul *man*-*ss*-*ta*.
 Swuni-Nom Inho-Acc meet-Pst-Dcl
 ‘Swuni met Inho.’
- b’. *Swuni-**nun** Inho-lul *man*-*ss*-*ta*.
 Swuni-Top Inho-Acc meet-Pst-Dcl
 ‘As for Swuni, she met Inho.’

In (3), *ecey* ‘yesterday’ is presented as the topic of the sentence. Therefore, the subject *Swuni* in (3b) and (3b’) is not conceived of as a topic, although it is old information (because it is already mentioned in the previous sentence). Instead, it is a tail, i.e. [–New, –Prom], in the current information structure. Since the nominative case marker is informationally neutral, as argued above, the subject phrase marked with the regular nominative case marker in (3b) is allowed in this context.³ However, the subject phrase marked with *nun*, which is informationally very restricted, is not allowed in this context, as shown in (3b’). That is, *nun* cannot mark tailhood.

Information encoding by *nun* is not limited to topic. In addition to the topic reading described above, the same morpheme *nun* encodes a ‘focus’ reading, more specifically, a contrastive focus reading. Consider the example in (4).

- (4) a. Swuni-*ka* Inho-**lul** *man*-*ss*-*ta*.
 Swuni-Nom Inho-Acc meet-Pst-Dcl
 ‘Swuni met Inho.’ [neutral]

³It is known that the nominative case marker *ga* in Japanese cannot be used in this context (Kuno 1972, Haig 1982). That is, *ga* cannot mark any [–New] element, i.e. neither topic nor tail.

b. Swuni-ka Inho-**nun** manna-ss-ta.

Swuni-Nom Inho-Top meet-Pst-Dcl

‘Swuni met Inho (but not others).’/‘Swuni met at least Inho.’

[contrastive focus]

Just like the nominative case marker *ka*, the accusative case marker does not itself function as an information encoder, thus letting the object phrase in (4a) be informationally neutral (in the default position). In contrast, when *nun* is attached to the object phrase as in (4b), the phrase acquires a special status. This time, the *nun*-phrase is interpreted as a contrastive focus. As shown in the translations, (4b) implies that ‘Swuni met Inho, but she did not meet other people’, or ‘Swuni met Inho at least, but we do not know whether she met other people too.’ Namely, the entity referred to by the *nun*-phrase is (implicitly) compared with other potential alternatives, and thus gains ‘prominence’ relative to other entities (see chapter 3 for the difference between completive focus and contrastive focus).

Not only an object phrase but also a subject phrase is interpreted only as a contrastive focus. Let us examine the existential construction below.

(5) a. chayksang-wiey chayk-**i** iss-ta.

desk-on book-Nom be-Dcl

‘There is/are (a) book(s) on the desk.’

b. chayksang-wiey chayk-**un** iss-ta.

desk-on book-Top be-Dcl

‘There is/are (a) book(s) on the desk (but nothing else).’ [contrastive focus]

In the existential construction, as shown in (5), the base position of the subject is not sentence-initial: it follows the locative phrase.⁴ When the subject is marked with

⁴See Kuno (1973) for detailed arguments for the base order of the Japanese existential construction. The same arguments hold for Korean.

nun in this position, it always has a contrastive reading.

As a contrastive focus, therefore, a *nun*-phrase cannot appear in a context which requires, for instance, a completive focus. A ‘presentational’ construction is such an example. Consider the examples below.

(6) a. yeysnal-ey han maul-ey Swuni-lanun ai-**ka** sal-ass-ta.
 past-in one village Swuni-named child-Nom live-Pst-Dcl
 ‘Once upon a time, there lived a child named Swuni in a village.’

b. *yeysnal-ey han maul-ey Swuni-lanun ai-**nun** sal-ass-ta.
 past-in one village Swuni-named child-Top live-Pst-Dcl
 ‘Once upon a time, there lived a child named Swuni (but not others)
 in a village.’

The main function of a ‘presentational’ construction is to introduce a new entity into the discourse. Hence, it is expected that the entity which is to be introduced is purely ‘new’ information, which is classified as completive focus in the current framework. A *nun*-phrase, which is informationally more loaded since it expresses contrastiveness and thus carries ‘prominence’ as well as ‘newness’, is very awkward in this context, as shown in (6b).

5.1.2 *nun* as a [+Prom] marker

We have observed above that *nun* in Korean sometimes expresses the topichood of a phrase and sometimes encodes the contrastive focality of it. The fact that a single morpheme *nun* marks two very different functions, i.e. topic and contrastive focus, has been a source of controversy in Korean literature. It has even been suggested, due to the lack of any satisfactory explanation, that there are actually two distinct but homophonous morphemes, one for topic, and another for contrastive focus. (See

Choi (1984) for a literature review on the debate on the double functions of *nun*. See also Lee (1989), Lee (1991), and Kim (1990).)

Not surprisingly, however, *nun* marking in Korean is not the only case where topic and contrastive focus are encoded by a single mechanism. Recall the information encoding by “topicalization” in English discussed in section 3.2.4 in chapter 3. The so-called topicalized phrase is often interpreted as a contrastive focus as well as a topic. Consider the examples again, which are repeated from chapter 3.

- (7) a. THE PLAY John saw yesterday.
 b. FIDO they named their dog.

Both *the play* in (7a) and *Fido* in (7b) are equally topicalized to the sentence-initial position from their canonical positions which are immediately after the verb. However, *the play* in (7a) is interpreted as a topic, i.e. prominent old information, which the phrases that follow comment on and provide new information about. In contrast, *Fido* in (7b) is ‘new’ and moreover, ‘prominent’ information (see the discussion in section 3.2.4), while the rest is given information.

The feature-based information structure proposed in this thesis provides a straightforward answer to this puzzle. It is in fact designed to capture the often-noted fact that topic and contrastive focus are somehow encoded by a single mechanism, e.g. by a special morpheme in Korean and by a syntactic operation in English. Recall the crossclassification of the four information types, repeated below in (8).

(8)

	+Prom	–Prom
–New	Topic	Tail
+New	Contrastive Focus	Completive Focus

As illustrated in (8), topic and contrastive focus share the ‘prominence’ property,

although they differ in that the former expresses ‘old’ information while the latter expresses ‘new’ information. Both are [+Prom] in this system.

Therefore, if we assume that the major function of the so-called topic marker is in fact to mark ‘prominence’ of the phrase it is attached to, i.e., *nun* in Korean is a morphological encoder of ‘prominence’, then it naturally follows that it will always express topic or contrastive focus. Moreover, why *nun* would not express any other type of information is also explained. Since the ‘prominence’ marking is an inherent morphological property, *nun* would never encode tail or completive focus, which are nonprominent ([−Prom]) by definition. Recall the examples in (2), (3), and (6) in the previous section. Therefore, the information structure system based on the crossclassifying features as in (8) naturally gives a uniform analysis to the dual function of *nun*. That is, *nun* in Korean is a [+Prom] marker.

$$(9) \text{ } nun \longrightarrow [+Prom]$$

Accordingly, a *nun*-phrase will be interpreted as topic or contrastive focus depending on the value of the feature [New], which will be given by other mechanisms of the grammar: if [−New], then topic; if [+New], then contrastive focus. In the next section, I will examine what determines the value for the feature [New] so as to systematically differentiate the two readings.

5.2 Information Structuring by Order

5.2.1 Reading Distribution and Relative Order

Our initial observation of the distribution of the two readings encoded by *nun* in section 1.1 suggests that the informational interpretation of a phrase can be also affected by the phrase structural configuration. Recall that a subject *nun*-phrase encodes a topic reading while an object *nun*-phrase encodes a contrastive focus reading. The

relevant examples are repeated in (10). It is immediately clear, however, that the grammatical function (e.g. subject, object, etc.) is not the crucial factor because a subject *nun*-phrase can also receive a contrastive focus reading, as shown in (11).

(10) a. Swuni-**nun** Inho-lul manna-ss-ta.

Swuni-Top Inho-Acc meet-Pst-Dcl

‘As for Swuni, she met Inho.’ [topic]

b. Swuni-ka Inho-**nun** manna-ss-ta.

Swuni-Nom Inho-Top meet-Pst-Dcl

‘Swuni met Inho (but not others).’ [contrastive focus]

(11) chayksang-wiey chayk-**un** iss-ta.

desk-on book-Top be-Dcl

‘There is/are (a) book(s) on the desk (but nothing else).’ [contrastive focus]

The phrase structural configuration of elements can be interpreted in two different ways, i.e. a specific position that the element in question is located in or its relative order (which may also come from phrase structural configuration as argued in chapter 2) with respect to other elements of the sentence. In fact, there have been a couple of proposals along the first line of approach. For example, following the Heim-Diesing type of view of the syntax-semantics mapping, Han (in press) argues that a VP-internal *nun*-phrase has a contrastive reading while a VP-external *nun*-phrase has a topic reading. Kim (1990) also makes a similar proposal.

There is evidence, however, which shows that it is not a specific position that an element is in which determines its information status. First of all, an element which is located in the same phrase structural position can be interpreted differently. Consider the subject *nun*-phrase in (12b).

- (12) a. *chinkwu-tul cwung nwuka Inho-lul manna-ss-ni?*
 friend-Pl among who-Nom Inho-Acc meet-Pst-Int
 ‘Who, among his friends, met Inho?’
- b. *Swuni-nun (ama) Inho-lul manna-ss-ul keya.*
 Swuni-Top probably Inho-Acc meet-Pst-Dcl
 ‘Swuni (but not others) probably met Inho.’
 ‘At least Swuni probably met Inho.’ [contrastive focus]

As illustrated in (12a), when the context demands it, the subject *nun*-phrase in its sentence-initial position can be interpreted as a contrastive focus as shown in (12b). One could argue that the sentence-initial position can be ambiguously either VP-external or VP-internal, and that the subject *nun*-phrase is actually within VP, e.g. in [Spec,VP] in (12b), while that in (10a) is outside VP. However, even though we put the sentential adverb *ama* ‘probably’ after the subject to mark the VP boundary (Diesing 1990), the *nun*-phrase still receives a contrastive focus reading.

Moreover, when the object phrase scrambles over the subject *nun*-phrase as in (13), the subject is unambiguously interpreted as a contrastive focus. The topic interpretation is not available in this case.

- (13) *Inho-lul Swuni-nun (ama) manna-ss-ul keya.*
 Inho-Acc Swuni-Top probably meet-Pst-Dcl
 ‘As for Inho, probably Swuni (but not others) met him.’ [contrastive focus]

This example shows that it is the relative order among the elements, i.e. between the subject and the object here, which determines the informational status of the elements. It should be noted that the subject *nun*-phrase, *Swuni-nun* in (13), receives a contrastive focus reading and loses its topic reading, not because it is located in a different phrase structural position, but because some other element of the sentence,

i.e. the object *Inho-lul*, changes its location in the sentence so that the relative order between them is reserved.

A similar effect is noted in the double-subject construction. The first subject in a double- or multiple-subject construction is often argued to be VP-external (Kim 1990).

- (14) a. Seoul-**un** salam-i manh-ta.
 Seoul-Top person-Nom many-Dcl
 ‘As for Seoul, it has many people.’ [topic]
- b. salam-i Seoul-**un** manh-ta.
 people-Nom Seoul-Top many-Dcl
 ‘Speaking of people, Seoul (but not others places) has many of them.’
 [contrastive focus]

The external *nun*-phrase *Seoul-un* in (14a), as expected, receives a topic reading. However, when the internal nominative phrase *salam-i* scrambles over it, the *nun*-phrase loses its topic reading, and has a contrastive focus interpretation.

I have proposed in earlier chapters that scrambling is a major information encoder in German and is motivated and constrained by two information structuring constraints, which are repeated in (15).

- (15) Information Structuring Constraints:
- a. NEW: A [−New] element should precede a [+New] element.
- b. PROM: A [+Prom] element should precede a [−Prom] element.

It appears that Korean also makes use of constituent order as an information encoding mechanism, in addition to the morphological marking. I will argue in the remainder of this section that the same information structuring constraints, NEW and PROM in (15), are the major driving-forces for constituent reordering in Korean too. It is

an interesting result which shows the universality of the constraints proposed here: although German and Korean are typologically unrelated languages, their word order is constrained by the same set of constraints.

5.2.2 Scrambling motivated by Oldness

The fact that *nun* is a [+Prom] marker provides us with an interesting device for testing the motivation of scrambling. That is, as argued in the previous section, a *nun*-marked phrase always yields a topic reading or a contrastive focus reading and nothing else, i.e., a phrase marked with *nun* will always carry the [+Prom] feature with it. Suppose that we have two *nun*-phrases in a sentence. Then, it can be inferred that scrambling of a *nun*-phrase over the other is not motivated by ‘prominence’: since both of the *nun*-phrases do not differ in their [Prom] property, they need not switch their positions to adjust their relative order in accordance with the PROM constraint.

Given the information structuring constraints in (15), we can hypothesize that scrambling of a *nun*-phrase is motivated by the NEW constraint. In other words, scrambling is prompted to allow a [–New] element to precede a [+New] element. This hypothesis is well supported by the following data. Consider the examples in (16).

- (16) a. Swuni-nun ama **Inho-nun** manna-ss-ul keya.
 Swuni-Top probably Inho-Top meet-Pst-Dcl
 ‘As for Swuni, she probably met Inho (but not others).’
 [Swuni:topic; Inho:contrastive focus]
- b. **Inho-nun** Swuni-nun ama manna-ss-ul keya.
 Inho-Top Swuni-Top probably meet-Pst-Dcl
 ‘As for Inho, Swuni (but not others) probably met him.’
 [Swuni:contrastive focus; Inho:topic]

Suppose that both (16a) and (16b) describe events where Swuni met Inho, that is, Swuni is the subject and Inho is the object (since both phrases are marked with *nun*, their grammatical functions are not differentiated by the morphological case marking). Unlike the in-situ object *nun*-phrase in (16a), the scrambled object *Inho-nun* in (16b) cannot be interpreted as a contrastive focus: it must be interpreted as a topic. On the other hand, the subject *nun*-phrase *Swuni-nun* in (16b), which is scrambled over by the object phrase, can only be interpreted as a contrastive focus, not as a topic. This is also in contrast with the in-situ subject phrase in (16a). In other words, the scrambled object *Inho-nun* is [−New,+Prom] whereas the left-over subject phrase *Swuni-nun* is [+New,+Prom]. Since both the subject and the object are [+Prom] inherently as argued above, what these examples show is that the *nun*-phrases are aligned according to their ‘newness’ in the scrambled example (16b). That is, the scrambling in (16b) is triggered by the NEW constraint.

Similarly, the subject *nun*-phrase *chayk-un* ‘book’ in the existential construction also acquires a topic interpretation when it is scrambled over the locative phrase while the left-over locative phrase *tosekwan-ey-nun* ‘in the library’ receives a contrastive focus reading. This is shown in (17).

(17) a. *tosekwan-ey-nun chayk-un iss-ta.*

library-in-Top book-Top be-Dcl

‘In the library, there are at least books (but maybe not other things).’

[library:topic; book:topic]

b. *chayk-un tosekwan-ey-nun iss-ta.*

book-Top library-in-Top be-Dcl

‘As for books, they are at least in the library (but maybe not in other places).’

[library:contrastive focus; book:topic]

Here again, since both the elements share the [+Prom] feature, the scrambling in (17b) can be regarded as being motivated by their difference in the [New] feature:

the [−New] element scrambles over the [+New] element.

To recapitulate, as defined in the current information structure based on the [New] and [Prom] features, the only difference between topic and contrastive focus is that topic is [−New] and contrastive focus is [+New]; they are identical in terms of the [Prom] feature, i.e., both are [+Prom]. Hence, the fact that the scrambled *nun*-phrase in (16b) and in (17b) has a topic reading while the *nun*-phrase which is scrambled over receives a contrastive focus reading, shows that scrambling has rearranged the elements of the sentence in accordance to the NEW constraint, which requires a [−New] element to precede a [+New] element. In other words, the NEW constraint is fairly active in Korean as well as in German as a constraint on the constituent order. I will show in the next section that the PROM constraint is also effective in this language.

5.2.3 Scrambling motivated by Prominence

It is well-known that Korean, along with Chinese and Japanese, does not have *wh*-movement. That is, a *wh*-phrase in Korean stays in situ in syntax whereas that in English or German has to be preposed to the sentence-initial position (e.g. [Spec,CP]) with the exception of the *echo*-question case or the multiple *wh*-question construction. So, as illustrated below, leaving a *wh*-phrase in situ in English, for instance, as in (18a), is bad, while it is perfectly good in Korean as shown in (19a).

(18) a. *Did Mary meet **who(m)**?

b. **Who** did Mary meet?

(19) a. Swuni-ka **nwukwu-lul** manna-ss-ni?

Swuni-Nom who-Acc meet-Pst-Int

‘Who did Swuni meet?’

- b. **nwukwu-lul** Swuni-ka manna-ss-ni?
 who-Acc Swuni-Nom meet-Pst-Int
 ‘Who did Swuni meet?’

What is interesting is that a *wh*-phrase in Korean, which does not have to be preposed for any syntactic reason, can actually be scrambled. This is shown in (19b). This indicates that *wh*-phrases in Korean are no more restricted in their scramblability than any other regular phrases and that their position in a sentence is also determined by their information status.⁵

In addition to *nun*-phrase scrambling, scrambling of a *wh*-phrase serves as a revealing test to show the motivation for scrambling. A *wh*-phrase can be argued to inherently carry the [+New] feature because it always expresses ‘new’ information regardless of its position in a sentence. The *wh*-phrase *nwukwu-lul* in both (19a) and (19b) solicits new information as to *who* Swuni met, for example. Therefore, we can predict that its scrambling is not triggered by the NEW constraint. Moreover, the NEW constraint is supposed to discourage scrambling of a [+New] element: it would place a [−New] element in front of a [+New] element.

Thus we can now hypothesize that scrambling of a *wh*-phrase is motivated by the PROM constraint, namely it is prompted to be placed in a noncanonical position to realize its [+Prom] feature. This predicts that a scrambled *wh*-phrase should be interpreted as a contrastive focus, i.e. [+New,+Prom], rather than simply as a completive focus, i.e. [+New,−Prom]. This prediction is borne out. Let us return to the examples in (19). The scrambled sentence in (19b) is indeed interpreted slightly differently from the canonically-ordered sentence in (19a). The question (19b) implies that there is a set of people that Swuni might have met, and asks *WHO* among them

⁵While the scrambling of *wh*-phrases is as free as that of other phrases, it seems to be fairly restricted and often impossible, in German. See Moltmann (1990) for a brief discussion of the facts.

Swuni actually met. That is, the person who Swuni actually met receives ‘prominence’ in distinction to other people she might have met. So, (19b) can be better translated as ‘Who is it (among the people) that Swuni met?’.

Likewise, the scrambling of a nominative-case phrase in the existential construction shows a similar effect. The *wh*-phrase in (20b) solicits ‘prominent’ new information.

- (20) a. chayksang-wiey **mwues-i** iss-ni?
 desk-on what-Nom be-Int
 ‘What is there on the desk?’
- b. **mwues-i** chayksang-wiey iss-ni?
 what desk-on be-Int
 ‘What is it that is on the desk?’

That the scrambled question phrase expresses contrastive focus rather than complete focus is supported by the examples in (21).

- (21) a. **mwues-i** chayksang-wiey iss-ni?
 what desk-on be-Int
 ‘What is it that is on the desk?’
- b. *chayksang-wiey **chayk-i** iss-e.
 desk-on book-Nom be-Dcl
 ‘There is a book on the desk.’
- b’. **chayk-i** chayksang-wiey iss-e.
 book-Nom desk-on be-Dcl
 ‘It is a book that is on the desk.’

The question in (21a) requests prominent and new information as argued above. (21b) is an existential sentence in the default configuration where the nominative-phrase is positioned after the locative phrase. As is usually the case, an existential construction presents purely new information in the discourse, so the *chayk* ‘book’ in (21b) in the default position is interpreted as completive focus. Therefore, (21b) is not appropriate as an answer to the question in (21a) because, while the question requests a contrastive focus, the answer provides a completive focus, thus causing an informational clash. In contrast, the scrambled phrase *chayk* in (21b’) is interpreted as a contrastive focus, thanks to scrambling, just as the *wh*-phrase in (21a) is. Hence, only the scrambled sentence (21b’) can be a proper answer to the scrambled question in (21a).

5.2.4 Ambiguity Resolution by Further Constraints

We have now established that scrambling in Korean is motivated by the NEW constraint or the PROM constraint. Although I have presented examples which involve either a *nun*-phrase or a *wh*-phrase in order to control the informational environment, scrambling, of course, is not limited to these types of phrases. In other words, when a regular phrase is scrambled, it is expected that ambiguity arises as to whether it is scrambled to realize its ‘oldness’ or to realize its ‘prominence’. I will show in this subsection how ambiguity is resolved by the constraints we have already developed in the previous chapters.

Prosodic Constraints

Scrambling of an object, for example, yields a couple of different interpretations. Consider the examples in (22).

- (22) a. Swuni-ka Inho-lul manna-ss-ta.
 Swuni-Nom Inho-Acc meet-Pst-Dcl
 ‘Swuni met Inho.’
- b. **Inho-lul** Swuni-ka manna-ss-ta.
 Inho-Acc Swuni-Nom meet-Pst-Dcl
 ‘As for Inho, Swuni met him.’ [topic,tail]
 ‘It is Inho (among other people) who Swuni met.’ [contrastive focus]

The object phrase, *Inho* with the regular case marking as in (22a) is informationally neutral in the sense that it can be interpreted as old or new, or prominent or non-prominent information depending on the context and thus on the information status of the other elements of the sentence. Given no other context, the in-situ phrase is usually interpreted as a completive focus, providing new information to the discourse.

When the object phrase is scrambled as in (22b), however, it clearly partitions the sentence into two parts. Moreover, it partitions the sentence in two very different ways. Firstly, the scrambled object can be interpreted as ‘old’ ([−New]) information ([+Prom] or [−Prom] depending on the information status of the subject), and then the rest of the sentence becomes ‘new’ ([+New]) information. Secondly, it can be interpreted as ‘new’ information, actually, ‘prominent’ new information, i.e. contrastive focus (otherwise, it would not have scrambled in the first place), and in that case, the rest of the sentence is marked as ‘old’ information.⁶ Roughly speaking, scrambling can partition a sentence either into a Topic–Comment structure or into a Focus–Ground structure.

⁶Notably, though, it is never interpreted as a completive focus ([+New, −Prom]), which is the most common reading for the in-situ phrase. This result is exactly what is expected given the two information structuring constraints, NEW and PROM. If the scrambled phrase is interpreted as ‘new’ information rather than ‘old’ information, it follows that the phrase is necessarily [+Prom]: otherwise, the scrambling would not be prompted at all.

The ambiguity in information structuring is, fortunately, resolved by different prosodic patterns.⁷ Not surprisingly, speakers often note that a high pitch accent is used when the scrambled phrase is interpreted as a (contrastive) focus, but not necessarily so when it is interpreted as ‘old’ information.⁸ This contrast is shown in (23).

- (23) a. Inho-lul Swuni-ka manna-ss-ta.
 Inho-Acc Swuni-Nom meet-Pst-Dcl
 ‘As for Inho, Swuni met him yesterday.’ [topic]
- b. INHO-LUL Swuni-ka manna-ss-ta.
 Inho-Acc Swuni-Nom meet-Pst-Dcl
 ‘It is Inho (among other people) who Swuni met.’ [contrastive focus]

A similar prosodic contrast is noted in the interpretation of a *nun*-phrase in the identical configuration. Namely, only when a *nun*-phrase is interpreted as ‘new’ information, i.e. as a contrastive focus, does it acquire a high pitch accent. This is illustrated in (24).

- (24) a. Swuni-**nun** Inho-lul manna-ss-ta.
 Swuni-Top Inho-Acc meet-Pst-Dcl
 ‘As for Swuni, she met Inho.’ [topic]

⁷Prince (1981) makes a similar observation regarding the prosodic differences between a Topicalized sentence and a Focus-moved (or Y(iddish)-moved) sentence.

⁸If the scrambled element is interpreted as prominent old information, i.e. a topic, rather than nonprominent information, i.e. a tail, then it receives a certain degree of pitch accent, though it is much weaker than that which a ‘new’ element receives. It may be the case that prominence as well as newness triggers high pitch accents. However, for simplicity of discussion, I will assume that only a [+New] element has a pitch accent.

- b. SWUNI-**NUN** Inho-lul manna-ss-ta.
 Swuni-Top Inho-Acc meet-Pst-Dcl
 ‘Swuni (but not others) met Inho.’
 ‘At least Swuni met Inho.’ [contrastive focus]

This fact leads some linguists like Choe (1995), to argue that the topic marker *nun* in (24a) and the contrastive marker *nun* in (24b) are in fact two separate morphemes: the topic marker is *nun* and the contrastive focus marker is *NUN*.

Now recall the prosodic constraint $[+\acute{N}]$, which was introduced in chapter 3 as part of the information structuring constraints. It requires that new information have a high pitch accent. It was argued for German in chapter 4 that this constraint is ranked higher than the ‘economy’ type of constraint $*\acute{X}$, so that it will always place a pitch accent on ‘focused’ elements, both completive and contrastive. The constraints and the ranking between them are listed below.

(25) Prosodic Constraints:

- a. $[+\acute{N}]$: Put a high pitch accent on a new-information element.
 b. $*\acute{X}$: Do not place any pitch accent.

(26) Ranking:

$$[+\acute{N}] \gg *\acute{X}$$

Suppose that Korean has the same ranking between these two prosodic constraints as in (26). Then, it predicts that the scrambled phrase in (23) will receive a high pitch accent only when it is interpreted as a contrastive focus, but not as ‘old’ information. Similarly, the interpretation of the in-situ *nun*-phrase in (24) will be differentiated in a parallel way. Therefore, it is not necessary to assume two separate morphemes for *nun*.

Hence, the ranking between the two prosodic constraints in (25) further disambiguates the underdetermined interpretation of a scrambled phrase, which has not been fully distinguished by the phrase structural configuration.

SPECIFICITY Constraints

Scrambling of a bare noun in Korean provides a more interesting case. Nouns in Korean can be multiply ambiguous because morphological specification of definiteness as well as for plurality is optional in this language. Therefore, a bare noun *chayk* ‘book’, for example, can mean several different things, as shown in (27).

(27) *chayk*: ‘a book’, ‘the book’, ‘books’, ‘the books’

Putting aside the plurality problem for simplicity of discussion, I will concentrate on the definiteness problem.

An in-situ bare noun *chayk* ‘book’ can be interpreted either as ‘a book’ or ‘the book’, as shown in (28).

(28) Swuni-ka ecey chayk-ul ilk-ess-ta.
 Swuni-Nom book-Acc yesterday read-Pst-Dcl
 ‘Swuni read **a** book yesterday.’ [Nonspecific]
 ‘Swuni read **the** book yesterday.’ [Specific]

However, if it is scrambled as in (29a), especially when it does not have a pitch accent, it is uniformly interpreted as ‘*the* book’ (Lee 1993). Interestingly, when it is pitch-accented, as in (29b), the ambiguity remains.

(29) a. **chayk-ul** Swuni-ka ecey ilk-ess-ta.
 book-Acc Swuni-Nom yesterday read-Pst-Dcl
 ‘**The** novel, Swuni read yesterday.’

- b. **CHAYK-UL** Swuni-ka ecey ilk-ess-ta.
 book-Acc Swuni-Nom yesterday read-Pst-Dcl
 ‘It is **a/the** book that Swuni read yesterday.’

Given the previous discussion about the prosodic constraints, this implies that the scrambled object in (29a) is [−New], while that in (29b) is [+New]. Furthermore, it shows that when the bare noun *chayk-ul* is interpreted as a [−New] entity, it receives a specific reading, while when it is interpreted as a [+New] entity, it can receive either a specific or a nonspecific reading.

Likewise, the scrambled *ka*-phrase in (31a) *without* a pitch accent is interpreted as a specific book, whereas that in (31b) *with* a pitch accent is not necessarily interpreted as a specific book.

- (30) chayksang-wiey chayk-i iss-ta.
 desk-on book-Nom be-Dcl
 ‘There is a book on the desk.’

- (31) a. **chayk-i** chayksang-wiey iss-ta.
 book-Nom desk-on be-Dcl
 ‘**The** book is on the desk.’

- b. **CHAYK-I** chayksang-wiey iss-ta.
 book-Nom desk-on be-Dcl
 ‘It is **a/the** book that is on the desk.’

This also indicates that when a scrambled phrase is interpreted as a [−New] entity, it necessarily receives a specific reading.

This fact reminds us of the SPECIFICITY constraints which have been discussed in earlier chapters as constraints which control the discourse feature assignment in the

input. Recall that the first constraint about specific phrases can be easily violated whereas the second constraint cannot.

(32) SPECIFICITY:

- a. SP1: A specific phrase should not be [+New].
- b. SP2: A nonspecific phrase should not be [−New].

Therefore, in effect, that a nonspecific phrase should not be marked [−New] since (32b) is a highly ranked constraint, although a specific phrase does not have such a restriction, i.e., it can be marked either [−New] or [+New], since (32a) is easily violable. To put it in different words, a [+New] element can be either specific or nonspecific, while a [−New] element is necessarily specific. So, going back to the examples above, the scrambled phrase in (29a) and in (31a) cannot be interpreted as a nonspecific entity because it is [−New], whereas the scrambled phrase in (29b) and in (31b) is not constrained as such because it is [+New].

Therefore, if we assume that the second constraint SP2 is also an active constraint also in Korean, we can nicely capture the specificity distribution of the scrambled phrases illustrated above. It is interesting to note that in Korean, where the morphological marking of specificity/definiteness is very minimal, the specificity interpretation of an (underspecified) phrase heavily relies on its information status. This further supports the strong link between semantic specificity and the discourse notion of ‘oldness’.

5.3 Optimality-Theoretic Interaction between Morphology and Order

Scrambling involving a *nun*-phrase is an interesting case of information encoding because part of its information status is determined by the morphological marking

and the other part is determined by the phrase structural configuration. As I have argued above, *nun* is a [+Prom] marker which carries the feature [+Prom] as part of its morphological property. Whether it is interpreted as [+New] or [−New] is, then, determined by its relative position with respect to other elements of the sentence.

5.3.1 Constraints and Ranking

Although not explicitly mentioned, it has been the underlying assumption for Korean too that there is a certain ‘default’ phrase structural configuration for a sentence, which yields the ‘canonical’ word order among its elements, and scrambling has been viewed as a mechanism to *re-order* them. This canonical order is the one which is used in the ‘neutral’ context, i.e. when no contextual information is available or when all the elements are presented equally in their information status, e.g. as new information by default (cf. ‘neutral description’ in Kuno (1972) or ‘all-focus’ in Vallduví (1992)). As argued in chapter 2, Korean also has a configurational structure where the subject is generated as the most structurally prominent element, then the indirect object, and finally the direct object, in a ditransitive clause. Just as in German, this canonical structure will be chosen as the most optimal one by the phrase structural constraints:

(33) CANON:

- a. CN1: SUBJ should be structurally more prominent than (e.g. ‘c-command’) non-SUBJ functions.
- b. CN2: Non-SUBJ functions align reversely with the c-structure according to the functional hierarchy.

Accordingly, these phrase structural constraints CANON will generate the following order as ‘default’ unless the discourse-context demands otherwise.

- (34) Swuni-ka Inho-eykey chayk-ul cwu-ess-ta.
 Swuni-Nom Inho-Dat book-Acc give-Pst-Dcl
 ‘Swuni gave Inho a book.’

If a sentence is used in a certain discourse context, and the constituents of the sentence are differentiated as such in their information status, then the information structuring constraints such as NEW and PROM in (35) will be involved and interact with CANON to yield the ‘optimal’ word order in that specific context.

- (35) Information Structuring Constraints:
 a. NEW: A [–New] element should precede a [+New] element.
 b. PROM: A [+Prom] element should precede a [–Prom] element.

In chapter 4, I have argued that these constraints are ranked as follows in German.

- (36) Constraint Ranking (German):

$$\text{PROM} \gg \text{CN1} \gg \left\{ \begin{array}{l} \text{NEW} \\ \text{CN2} \end{array} \right\}$$

It was argued, particularly, that the subconstraints of CANON split in German and that CN1, the subject constraint, is ranked higher than CN2, the non-subject constraint, to capture the fact that the subject is harder to scramble over than non-subject elements are. Furthermore, CN1 was argued to be ranked between the PROM constraint and the NEW constraint, which shows that only a [+Prom] element can scramble over the subject while a [–New] element cannot.

However, in Korean, the subject does not appear to behave distinctly from other elements of the sentence. It is as easily scrambled over. Consider the examples in (37) and (40) below. Let us first look at the ordering between the non-subject elements in (37).

- (37) a. Swuni-ka nwukwu-eykey nonmwun-ul cwu-ess-ni?
 Swuni-Nom who-Dat thesis-Acc give-Pst-Int
 ‘To whom did Swuni give her thesis?’
- b. Swuni-ka **nonmwun-ul** Inho-eykey cwu-ess-ta.
 Swuni-Nom thesis-Acc Inho-Dat give-Pst-Dcl
 ‘Swuni gave her thesis to Inho.’
- b’. Swuni-ka Inho-eykey **nonmwun-ul** cwu-ess-ta.
 Swuni-Nom Inho-Dat thesis-Acc give-Pst-Dcl
 ‘Swuni gave Inho her thesis.’

If the context requires that the indirect object is presented as [+New] and the direct object is presented as [−New], as shown above, then the default order of the indirect object followed by the direct object, as in (37b’), violates the NEW constraint. This triggers the [−New] direct object *nonmwun-ul* ‘thesis’ to scramble over the [+New] indirect object *Inho-eykey* ‘to Inho’, which generates the output in (37b). The example (37b) shows that the NEW constraint is ranked higher than the non-subject phrase structural constraint CN2 because the satisfaction of NEW yields a good sentence in spite of the violation of CN2.

(38) Ranking:

NEW ≫ CN2

However, the default ordered sentence in (38b’) is also possible in this context, which indicates that the default order is selected despite the undesirable order between the two object phrases in terms of ‘newness’. In other words, a sentence can be good when CN2 is satisfied and the NEW constraint is violated. This result gives the opposite ranking between NEW and CN2.

(39) Ranking:

CN2 \gg NEW

Therefore, we can conclude that NEW and CN2 in Korean are unranked with respect to each other just as is the case in German.

Now, consider the subject case in (40). In this context, the subject is [+New] and the indirect object is [−New]. There are no other contextual clues that would signal either element as being [+Prom]. So, the PROM constraint does not play a role here.

- (40) a. *nwuka Inho-eykey chayk-ul cwu-ess-ni?*
 who-Nom Inho-Dat book-Acc give-Pst-Int
 ‘Who gave Inho a book?’/‘Did anybody give Inho a book?’
- b. **Inho-eykey** *Swuni-ka chayk-ul cwu-ess-ta.*
 Inho-Dat Swuni-Nom book-Acc give-Pst-Dcl
 ‘Swuni gave Inho a book.’
- b’. *Swuni-ka Inho-eykey chayk-ul cwu-ess-ta.*
 Swuni-Nom Inho-Dat book-Acc give-Pst-Dcl
 ‘Swuni gave Inho a book.’

Unlike in the German counterpart, simple ‘oldness’ can trigger the indirect object’s scrambling over the subject in Korean. The [−New] indirect object *Inho-eykey* ‘to Inho’ scrambles over the [+New] subject *Swuni-ka* ‘Swuni’ in (40b). Just like the non-subject case, the default order is also possible, which shows that NEW and CN1 are not ranked.

(41) Ranking:

a. CN1 \gg NEW

b. NEW \gg CN1

Therefore, we can conclude that the phrase structural subconstraints CN1 and CN2 in Korean do not split as two separate ranked constraints. Hence, I will refer to them collectively as CANON from now on. CANON is unranked with respect to NEW in Korean.

Finally, the examples in (42) show that the PROM constraint is ranked the highest in Korean as well as in German. If the context demands a contrastive focus, as in (42), then the contrastive focus *Swuni-ka*, which is [+New,+Prom], is ordered before the tail *Inho-eykey*, which is [−New,−Prom], as shown in (42b). The other order is not possible, as illustrated in (42b'). This shows that a violation of PROM as in (42b') is more serious than the violation of NEW in (42b), resulting in the ranking in (43).

- (42) a. *chinkwu-tul cwung nwuka Inho-eykey chayk-ul cwu-ess-ni?*
 friend-Pl among who-Nom Inho-Dat book-Acc give-Pst-Int
 'Who among his friends gave Inho a book?'
- b. *Swuni-ka Inho-eykey chayk-ul cwu-ess-ta.*
 Swuni-Nom Inho-Dat book-Acc give-Pst-Dcl
 'Swuni gave Inho a book.'
- b'. **Inho-eykey Swuni-ka chayk-ul cwu-ess-ta.*
 Inho-Dat Swuni-Nom book-Acc give-Pst-Dcl
 'Swuni gave Inho a book.'

(43) Ranking:

PROM ≫ NEW

Thus, (44) is the final ranking between the information structuring constraints NEW and PROM, and the phrase structural constraint CANON.

(44) Constraint Ranking (Korean):

$$\text{PROM} \gg \left\{ \begin{array}{c} \text{NEW} \\ \text{CANON} \end{array} \right\}$$

5.3.2 Choosing between Topic and Contrastive Focus

Having identified the constraints involved in information encoding in Korean and the ranking among them, let me now explain the reading distribution of a *nun*-phrase in terms of Optimality Theory.

Let us begin with the sentence in which the subject phrase is marked with *nun* as in (45).

- (45) Swuni-**nun** Inho-lul manna-ss-ta.
 Swuni-Top Inho-Acc meet-Pst-Dcl
 ‘Swuni met Inho.’

Recall the discussion in the preceding sections that the subject *nun*-phrase can be interpreted as a topic or a contrastive focus in the canonical configuration whereas when it is scrambled over by another element of the sentence, it loses its topic reading and only receives a contrastive focus interpretation.

- (46) a. Swuni-**nun** Inho-lul manna-ss-ta.
 Swuni-Top Inho-Acc meet-Pst-Dcl
 ‘As for Swuni, she met Inho.’ [topic]
 ‘Swuni (but not others) met Inho.’ [contrastive focus]
- b. Inho-lul Swuni-**nun** manna-ss-ta.
 Inho-Acc Swuni-Top meet-Pst-Dcl
 ‘Inho, Swuni (but not others) met.’ [contrastive focus]

Now, let me show how the OT analysis can capture this generalization about the readings.

Even without any contextual clues, we know that the subject *Swuni* will be interpreted either as a topic or a contrastive focus because *nun* automatically marks *Swuni* as [+Prom] in the input, as in (47), because [+Prom] is its invariable morphological property. The rest of the discourse features will be filled in from the context.

$$(47) \left[\begin{array}{l} \text{PRED} \quad \text{'manna(x,y)'} \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{"Swuni"} \\ \text{Prom +} \end{array} \right]_x \\ \text{OBJ} \quad \left[\begin{array}{l} \text{"Inho"} \end{array} \right]_y \\ \text{TENSE} \quad \text{'past'}$$

The candidates are all the scrambled variants of the default-order sentence. Since the sentence in question contains two scramblable elements, i.e. the subject *Swuni-nun* and the object *Inho-lul*, we have two candidate outputs. And the ranking among the constraints discussed in the previous subsection will generate the tableau in (48) for each input.

(48)

	CANDIDATES	PROM	NEW	CANON
a.	Swuni-nun Inho-lul			
b.	Inho-lul Swuni-nun			

Now, let us first suppose that the subject *Swuni* is the given information, i.e. [−New], and the object *Inho* is new information [+New]. This automatically endows the subject *Swuni* with topichood because the morphology *nun* has already given it the [+Prom] feature. Given the ranking among the constraints, we can predict that *Swuni-nun* as a topic would never be scrambled over by *Inho-lul* because both of its features, i.e. [−New] and [+Prom], urge it to precede other elements. The example

in (49) shows that the object phrase cannot scramble over the subject topic phrase even when it is also interpreted as [+Prom]: its [+New] feature makes it lose to the topic phrase.

- (49) a. Swuni-nun? Swuni-ka chinkwu-tul cwung nwukwu-lul manna-ss-ni?
 Swuni-Top Swuni-Nom friend-Pl among who-Acc meet-Pst-Int
 ‘What about Swuni? Who among her friends did Swuni meet?’
- b. *Inho-lul Swuni-nun manna-ss-ta.
 Inho-Acc Swuni-Top meet-Pst-Dcl
 ‘Swuni met Inho.’

Therefore, regardless of the information status of the object *Inho-lul*, whether it is a completive focus or a contrastive focus, the subject will precede the object. This is demonstrated in the two tableaux in (50) and (51).

- (50) a.

Swuni-nun	Inho-lul
[−New,+Prom]	[+New,−Prom]
Topic	CompFoc

- b.

	CANDIDATES	PROM	NEW	CANON
☺a.	Swuni-nun Inho-lul			
b.	Inho-lul Swuni-nun	*	*	*

- (51) a.

Swuni-nun	Inho-lul
[−New,+Prom]	[+New,+Prom]
Topic	ContFoc

b.

	CANDIDATES	PROM	NEW	CANON
☺a.	Swuni-nun Inho-lul			
b.	Inho-lul Swuni-nun		*	*

On the other hand, if the subject *Swuni-nun* is new information or focus, then Swuni will have the [+New] marking, thus being a contrastive focus. In this case, the only thing which can precede a contrastive focus is a topic because a topic is not only [+Prom] but also [−New]. Therefore, if *Inho* is simply a tail as in (52), then *Inho* cannot precede *Swuni*, so *Swuni* will have a contrastive focus reading in the initial position, as shown in (52).

- (52) a. chinkwu-tul cwung nwuka Inho-lul manna-ss-ni?
 friend-Pl among who-Nom Inho-Acc meet-Pst-Int
 ‘Who, among his friends, met Inho?’
- b. Swuni-**nun** Inho-lul manna-ss-ta.
 Swuni-Top Inho-Acc meet-Pst-Dcl
 ‘At least Swuni met Inho.’ [contrastive focus]
- b’. *Inho-lul Swuni-**nun** manna-ss-ta.
 Inho-Acc Swuni-Top meet-Pst-Dcl
 ‘Swuni met Inho.’

The tableau in (53) exactly predicts this situation.

(53) a.

Swuni-nun	Inho-lul
[+New, +Prom]	[−New, −Prom]
ContFoc	Tail

b.

	CANDIDATES	PROM	NEW	CANON
☺a.	Swuni-nun Inho-lul		*	
b.	Inho-lul Swuni-nun	*		*

Because the PROM constraint is ranked higher than the NEW constraint in this language, a tail cannot scramble over a contrastive focus.

In contrast, if *Inho* is also prominent and thus becomes a topic, then *Inho* can precede *Swuni-nun*, so *Swuni* will have a contrastive focus reading in the left-over position as shown in (54b).

- (54) a. Inho-nun? chinkwu-tul cwung nwuka Inho-lul manna-ss-ni?
 Inho-Top friend-Pl among who-Nom Inho-Acc meet-Pst-Int
 ‘What about Inho? Who, among his friends, met Inho?’
- b. Inho-lul Swuni-nun manna-ss-ta.
 Inho-Acc Swuni-Top meet-Pst-Dcl
 ‘As for Inho, Swuni (but not others) met him.’ [contrastive focus]

Note that the tableau actually gives the two outputs in this context because NEW and CANON are tied, and thus both rankings of the constraints are possible.⁹ Still, this is the only context in which the object *Inho-lul* can scramble over the subject

⁹Actually, candidate (a) is not very good in this context. This may be because of a general principle that ‘a topic should be predicated of a ‘contentful enough’ comment’ or ‘the predicate should be contrastive enough’. (See ‘Principle of Contrastiveness’ in de Hoop (1992). See also the discussion in Reinhart (1995).) In (a), the comment to the topic *Inho* is the simple verb *manna-ss-ta*: it is too weak to support the topic, in a sense. Consider the examples in (i).

- (i) a. pi-nun o-n-ta.
 rain-Top come-Prs-Dcl
 ‘It is raining.’
- b.

Swuni-nun. In other words, if a *nun*-phrase is scrambled over by another element, it necessarily receives a contrastive focus reading.

(55) a.

Swuni-nun	Inho-lul
[+New,+Prom]	[-New,+Prom]
ContFoc	Topic

b.

	CANDIDATES	PROM	NEW	CANON
☺a.	Swuni-nun Inho-lul		*	
☺b.	Inho-lul Swuni-nun			*

Overall, the tableaux above tell us that a subject *topic* phrase cannot be scrambled over. In other words, if a subject *nun*-phrase is scrambled over, it must be interpreted as a contrastive focus. This is exactly what we initially observed in (46). That is, the scrambled sentence (46b) only receives a contrastive focus reading, while the default sentence can have both interpretations. Therefore, the OT analysis successfully captures the reading distribution of the subject *nun* sentence.

Now, let us take the case of the object *nun*-phrase as the next example. The competition in this case lies between the two orders in (56a) and (56b).

(56) a. Swuni-ka Inho-**nun** manna-ss-ta.

Swuni-Nom Inho-Top meet-Pst-Dcl

‘Swuni met Inho.’

pi-nun ekswukathi o-n-ta.
 rain-Top heavily come-Prs-Dcl
 ‘It is raining cats and dogs.’

Interestingly, the subject *nun*-phrase in (ia) with the simple predicate ‘to come down’ is almost exclusively interpreted as a contrastive focus, while the same *nun*-phrase in (ib) with the more ‘contrastive’ predicate ‘to come down heavily’ can be interpreted as a topic.

- b. Inho-**nun** Swuni-ka manna-ss-ta.
 Inho-Top Swuni-Nom meet-Pst-Dcl
 ‘Swuni met Inho.’

As is the case with the subject *nun*-phrase, the object *Inho-nun* also carries the [+Prom] feature as its morphological property, as shown in the input in (57).

$$(57) \left[\begin{array}{ll} \text{PRED} & \text{'manna(x,y)'} \\ \text{GF}_1 & \left[\text{"Swuni"} \right]_x \\ \text{GF}_2 & \left[\begin{array}{l} \text{"Inho"} \\ \text{Prom +} \end{array} \right]_y \\ \text{TENSE} & \text{'past'}$$

First, consider the cases in which the subject phrase is interpreted as old information and the object *nun* phrase is thus interpreted as new information, namely, as a contrastive focus. Since the object phrase is now [+New,+Prom], its scramblability depends on the ‘prominence’ of the subject phrase: if the subject is [−Prom], i.e. if the subject is a tail, then the object *nun*-phrase can scramble over it. This is illustrated in (58).

- (58) a. chinkwu-tul cwung nwukwu-lul Swuni-ka manna-ss-ni?
 friend-Pl among who-Acc Swuni-Nom meet-Pst-Int
 ‘Who among her friends did Swuni meet?’
- b. Inho-**nun** Swuni-ka manna-ss-ta.
 Inho-Top Swuni-Nom meet-Pst-Dcl
 ‘Swuni met Inho (but not others).’ [contrastive focus]

Although the object *Inho-nun* is [+New], which prevents it from scrambling, its superiority over the subject in terms of prominence makes the scrambling possible. Recall the PROM constraint is ranked higher than the NEW constraint and also than CANON.

(59) a.

Swuni-ka	Inho-nun
[-New, -Prom]	[+New, +Prom]
Tail	ContFoc

b.

	CANDIDATES	PROM	NEW	CANON
a.	Swuni-ka Inho-nun	*		
☺b.	Inho-nun Swuni-ka		*	*

In contrast, if the subject *Swuni-ka* is [+Prom] as well and thus receives a topic reading, then scrambling of the object is prohibited, as expected.

(60) a. Swuni-nun? Swuni-ka chinkwu-tul cwung nwukwu-lul manna-ss-ni?

Swuni-Top Swuni-Nom friend-Pl among who-Acc meet-Pst-Int

‘What about Swuni? Who among her friends did Swuni meet?’

b. *Inho-nun Swuni-ka manna-ss-ta.

Inho-Top Swuni-Nom meet-Pst-Dcl

‘Swuni met Inho.’

The object *nun*-phrase is not distinct from the subject phrase in terms of prominence, i.e., both are [+Prom], and moreover, the NEW constraint and CANON encourages it to remain in situ.

(61) a.

Swuni-ka	Inho-nun
[-New, +Prom]	[+New, +Prom]
Topic	ContFoc

b.

	CANDIDATES	PROM	NEW	CANON
☺a.	Swuni-ka Inho-nun			
b.	Inho-nun Swuni-ka		*	*

On the other hand, if the object *Inho-nun* is old information, i.e. [−New], and thus is interpreted as a topic, then it can always scramble, as expected.

- (62) a. Inho-nun? nwuka Inho-lul manna-ss-ni?
 Inho-Top who-Nom Inho-Acc meet-Pst-Int
 ‘What about Inho? Who met Inho?’
- b. Inho-**nun** Swuni-ka manna-ss-ta.
 Inho-Top Swuni-Nom meet-Pst-Dcl
 ‘As for Inho, Swuni met him.’ [topic]

This is illustrated in the tableaux in (63) and (64).

(63) a.

Swuni-ka	Inho-nun
[+New, −Prom]	[−New, +Prom]
CompFoc	Topic

b.

	CANDIDATES	PROM	NEW	CANON
a.	Swuni-ka Inho-nun	*	*	
☺b.	Inho-nun Swuni-ka			*

(64) a.

Swuni-ka	Inho-nun
[+New, +Prom]	[−New, +Prom]
ContFoc	Topic

b.

	CANDIDATES	PROM	NEW	CANON
☺a.	Swuni-ka Inho-nun		*	
☺b.	Inho-nun Swuni-ka			*

Therefore, the OT account illustrated above offers the desirable result that a non-subject *nun*-phrase can always scramble over the subject if it is interpreted as a topic, but it may or may not scramble depending on the [Prom] status of the subject if it is interpreted as a contrastive focus.¹⁰

5.4 Summary

To summarize, the constituent order in Korean is also influenced by the information status of each element of the sentence, and therefore constrained by the same set of constraints which govern German word order, i.e. the information structuring constraints NEW and PROM, interacting with the phrase structural constraints CANON. In this chapter, I have illustrated that a slight difference in ranking of the two sub-constraints of CANON, with the assumption that *nun* is a morphological encoder of ‘prominence’, nicely explains the scrambling data involving *nun*-phrases in Korean.

(65) Constraint Ranking (Korean):

$$\text{PROM} \gg \left\{ \begin{array}{l} \text{NEW} \\ \text{CANON} \end{array} \right\}$$

Together with the analysis of the German data demonstrated in chapter 4, the discussion in this chapter further supports the OT analysis of word order based on

¹⁰The candidate (64a) is not very felicitous in this context. Again this is the case in which the topic is not supported by a ‘contentful enough’ predicate. See the previous footnote.

the notion of candidate competition of the differently-ordered sentences and the interaction of violable constraints from both syntax and discourse. The OT analysis proposed here can provide a systematic account of *variation* and *optionality* in the ordering phenomena, which alternative analyses based only on one module of grammar have had difficulty with.

Chapter 6

Conclusion

This dissertation has investigated scrambling phenomena in German and Korean from the perspective that the different ordering possibilities are motivated and constrained by interactions of syntactic and discourse-pragmatic constraints of these languages. In particular, I have utilized Optimality Theory to demonstrate *how* these constraints from different modules of the grammar interact and resolve conflicts among one another to yield the “optimal” output, a sentence with a particular word order, in a given context.

I first summarize the conclusions reached from this research. I then discuss some issues raised in this dissertation which remain as areas for future research.

6.1 Summary and Concluding Remarks

Despite the various word order possibilities in these languages, a certain order is regarded as the unmarked or default one. Under the assumption that a surface word order is a reflection of a phrase structure, I examine the basic clause structures in German and Korean and conclude that both have a configurational S structure, i.e. [_S Subject [_{VP}...I.Object D.Object...V]] (chapter 2). I propose this as the ‘canonical’

structure for these languages, which is context-neutral and thus is solely determined by “grammatical” information. The canonical structure is defined to be the result of the mapping between the “grammatical” information in argument-structure and functional-structure and its phrase structural realization in constituent-structure. I argue that this mapping is controlled by a set of OT constraints called *CANON*.

Positing a configurational canonical structure in relatively free word order languages requires an explanation for the range of alternative word orders because the canonical structure only yields a subset of the surface word orders. I propose that there is another set of constraints which require word order to be determined by discourse information such as ‘newness’ and ‘prominence’ of each element. I identify these ‘information structuring’ constraints as *NEW* and *PROM*, which I argue to be the major motivation for alternative orders or scrambling (chapter 3). As a means of capturing the generalizations behind the various semantic and discourse-related effects associated with scrambling, I propose an information structure based on two crossclassifying discourse features: [New] and [Prom]. I also claim that the assignment of these features in the input is further restrained by the semantic properties of an element, e.g. specificity, and propose the *SPECIFICITY* constraints which handle the internal mismatch between semantic specificity and discourse oldness. Therefore, the ‘specificity’ effect is not treated as a direct syntax–semantics mapping, but is subsumed under the general syntax–discourse interface.

Since the phrase structural constraints and information structuring constraints try to align the elements of a sentence based on different types of information, i.e. syntactic and discursal respectively, they are in potential conflict. I propose that scrambling arises when the information structuring constraints, acting against the phrase structural constraints, which require that each element of the sentence be in its ‘canonical’ position, allow an argument to be out of its ‘canonical’ position, if it meets certain informational requirements. Using Optimality Theory, this interaction

or conflict resolution among the different constraints is carried out by the ranking among them. I propose the following rankings of the above constraints, namely the grammars, for German and Korean respectively (chapter 4 and chapter 5).

(66) Constraint Ranking (German):

$$\text{PROM} \gg \text{CN1} \gg \left\{ \begin{array}{c} \text{NEW} \\ \text{CN2} \end{array} \right\}$$

(67) Constraint Ranking (Korean):

$$\text{PROM} \gg \left\{ \begin{array}{c} \text{NEW} \\ \text{CANON} \end{array} \right\}$$

The two languages are almost identical in their word order possibilities, and only differ in one aspect: the subject effect, i.e. the subject is harder to scramble over than the other arguments are. This difference is handled with a slight change in the rankings of the constraints in each language. That is, in German the CANON constraints split into two, and the ‘subject’ constraint CN1 is ranked higher than the non-subject constraint CN2. The fact that the subject constraint is separated from the other phrase structural constraint and is actually ranked between the two information structuring constraints PROM and NEW in German reflects an interesting property of German subjects: the subject in German precedes all non-prominent elements; only a prominent element can precede the subject. This gives the subject more chances to be interpreted as the topic, thus making it behave as if it had dual roles, one as a grammatical function and the other as a discourse function.

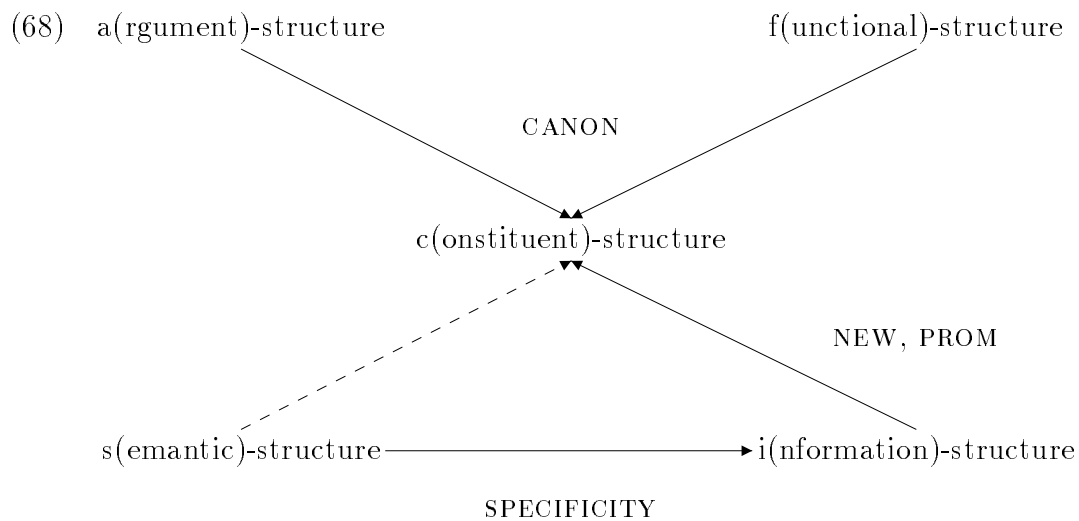
As such, the OT analysis proposed here can provide a systematic account of *variation* within the ordering phenomena. *Variation* here is not presented as “free”,

nor as a result of some ‘optional’ operation. Each scrambled variant is viewed as a necessary and also the most appropriate structure for instantiating all the relevant information in the given context. Thus the current OT analysis explains *why* and *how* variation occurs. First, each order is the optimal structural description for the given grammatical and discursive information in the input; since the discursive information of a sentence changes depending on the context, different orders arise. Also, each variant is an output which satisfies the constraints in the best possible way. Since the constraints are ranked according to their relative ‘weight’ or importance, given the input, the output is the automatic result of constraint competition.

The observation that discourse information such as focus and topic (reanalyzed as the combinations of the [New] and [Prom] features in the current analysis), as well as syntactic information, plays a role in determining word order has a long history (cf. the Prague School). In this sense, the main contribution of this dissertation may not lie in that it has uncovered “new” principles or constraints on scrambling, which have never been discussed before, but lies rather in that it has shown an example of *how* those constraints *interact* with each other to yield the optimal solution. This is a desirable consequence which confirms the core ideas in Optimality Theory: the OT constraints are proposed to be universal, although ranked differently in different languages, and thus the fact that some constraints have precedents in linguistic theory further supports their universality.

Moreover, since the constraints not only within a single module but also ones from different modules of grammar, i.e. syntax and discourse, are in competition, the current OT framework provides a model of *interface* theory (cf. Reinhart 1995). In other words, *interface* is viewed here as the simultaneous competition of the constraints from several different sectors of the grammar. This interface approach is easily captured by the framework of LFG. Since LFG is organized in terms of parallel, copresent structures, not in terms of one structure derived from another, the

simultaneous constraint competition can be conceived of as a natural operational mechanism in this framework. In particular, adding the i(nformation)-structure to the already existing framework in an explicit fashion, provides a way to unite the formal aspects of language with the functional aspects, which is necessary for the explanation of word order phenomena. (68) illustrates the inter-module interactions involved in scrambling.



The syntactic influence on word order is realized in the form of the *CANON* constraints which govern the mapping between from a(rgument)-structure and the f(unctional)-structure to the c(onstituent) structure. On the other hand, the discoursal effect on word order is instantiated as the mapping between the i(nformation)-structure and the c(onstituent)-structure governed by the *NEW* and *PROM* constraints. Finally, the semantic influence on scrambling is indirectly accomplished via its control over the i(nformation)-structure by means of the *SPECIFICITY* constraints. It may also be the case that there is a direct mapping between the s(emantic)-structure and the c(onstituent)-structure, which may possibly involve the cases of scope effects realized in word order. Although I have not pursued this issue in this dissertation, the current framework does not prevent it from being incorporated as yet another

factor or constraint on word order phenomena.

6.2 Remaining Issues

In this section, I briefly discuss several issues raised in this dissertation which need further research.

First, the information structure (i-structure) should be further investigated, e.g. how it is internally structured and how it, as an independent grammatical representation, relates to other parts of grammar.

$$(69) \left[\begin{array}{l} \text{PRED} \quad \text{'geben(x,y,z)'} \\ \\ \text{GF}_1 \quad \left[\begin{array}{l} \text{"Hans"} \\ \text{New} - \\ \text{Prom} - \end{array} \right]_x \\ \\ \text{GF}_2 \quad \left[\begin{array}{l} \text{"dem Schüler"} \\ \text{New} - \\ \text{Prom} - \end{array} \right]_y \\ \\ \text{GF}_3 \quad \left[\begin{array}{l} \text{"das Buch"} \\ \text{New} + \\ \text{Prom} - \end{array} \right]_z \\ \\ \text{TENSE} \quad \text{'Past'}$$

Although I have simply added the discourse features [New] and [Prom] to the f(unctional)-structure as an input representation, as exemplified here in (69), the i(nformation)-structure should be thought of as an independent grammatical representation. Firstly, as briefly mentioned in chapter 3, the discourse feature assignment can be further restrained by syntactic, morphological, and semantic factors. These interactions with

other grammatical information cannot be efficiently captured if the discourse information is confined to the f-structure. Furthermore, the f-structure representation is nonconfigurational and unordered. However, the focus projection phenomena and also the nonspecific NP problem may require a more hierarchical organization of information structure. This hierarchical organization may also be different from the c-structural hierarchy.

Next, the notion of ‘candidates’ in OT should be further refined. I have assumed in chapter 4 that the competing candidates in syntax are those that share the skeletal f-structure: roughly speaking, the candidate sentences have more or less the same ‘meaning’ and contain identical lexical items. However, lexical choice itself is governed by information structural effects. Consider the following examples. In this dissertation, I have only considered cases in which the candidates have the fixed lexical choice, so that the answers are given in the full sentence form and no noun phrases are replaced by the pronouns, as in (70b). However, (70b’), with the old information replaced by a pronoun, is certainly a good and often preferred answer in this context.

- (70) a. Was hat Hans gekauft?
 what(Acc) has Hans bought
 ‘What did Hans buy?’
- b. Ich glaube daß **Hans** ein Buch gekauft hat.
 I believe that Hans a book(Acc) bought has
 ‘I believe that Hans bought a book.’
- b’. Ich glaube daß **er** ein Buch gekauft hat.
 I believe that he(Nom) a book(Acc) bought has
 ‘I believe that he bought a book.’

Korean poses a variant of this problem of lexical choice: it can drop any phrases which can be understood from the context. Consider the subject-drop case in (71b’).

- (71) a. Swuni-ka nwuku-lul manna-ss-ni?
 Swuni-Nom who-Acc meet-Pst-Int
 ‘Who did Swuni meet?’
- b. Swuni-ka Inho-lul manna-ss-ta.
 Swuni-Nom Inho-Acc meet-Pst-Dcl
 ‘Swuni met Inho.’
- b’. Inho-lul manna-ss-ta.
 Inho-Acc meet-Pst-Dcl
 ‘(She) met Inho.’

The problem of pronominalization and ‘pro’-drop must be taken into account in a full study of the optimization of lexical choices in context.

Finally, let me briefly mention the potential applicability of the current model to statistical and corpus-based work on word order (Hoberg 1981). The current analysis makes an interesting prediction about the real-world frequency distribution of the scrambled variants. The information structure theory proposed in this dissertation produces a finite number of possible ‘informational environments’ or discourse-contexts, given the limited number of elements in a sentence. Each element can be assigned [+/-New] and [+/-Prom] and the combinations of these feature assignments yield a finite number of discourse-contexts, each of which is represented in an OT tableau in the current theory. Each tableau in turn yields one (or more if there are tied constraints) optimal output, which differ depending on the input. Counting the number of each variant’s occurrence as an optimal output, we can predict which variant will appear the most frequently, and which one the least.¹

¹This prediction is under the assumption that each discourse-context has an equal chance of occurrence, which in reality may not be true. As such, some sort of statistical normalization would be required to derive more accurate quantitative predictions.

The quantitative implication of the current theory also offers an interesting speculation on the theory of markedness. Native speakers usually report that one variant sounds better than another. These intuitions are independently confirmed by large corpora where the preferred or unmarked variant is usually the more frequent one (cf. Anttila 1995). I have defined the unmarked or canonical structure to be the one which occurs in the neutral context, in which the one which is solely determined by the grammatical information is the optimal one. However, even though the neutral context is only one of the many contexts that the current information structure produces, the canonical structure is chosen as the optimal output in more than the neutral context, and is actually the most frequent optimal choice in the OT tableaux given the ranking of the constraints. Of course, the choice of the unmarked output will still be indirectly affected by the grammatical information because the CANON constraints are part of the determining factor. Yet, still, the unmarked variant as the most frequent optimal choice, incorporates the discourse-contextual considerations as well, and thus reflects the language-use factor in its definition.

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