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Tough construction in English: a Construction Grammar approach

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Tough construction in English: a Construction Grammar approach

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Yoon-Suk Chung

Abstract

Tough construction in English: a Construction Grammar approach

by

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Doctor of Philosophy in Linguistics

University of California, Berkeley

Professor Paul Kay, Chair

This study proposes a new analysis of the *Tough* construction (TC) in the English language. This analysis is couched within the non-modular, non-derivational, unification and inheritance-based framework of Construction Grammar (CG).

There are five major theoretical issues around which the study of the TC has revolved: (1) the identification of the TC in generative syntax as a species of either extraction or control; (2) the characterization of the *tough* predicate as either a raising or a control predicate; (3) the analysis of the *for*-phrase as either a PP or a complementizer + lower subject; and the classification of the *tough* infinitival phrase as (4) a VP, an IP, or a CP, and as (5) either a complement or an adjunct.

I argue that the TC is a species of neither extraction nor control, but rather of a third independent grammatical construction. I maintain that the *tough* predicate should be treated as a raising predicate and demonstrate how its apparent control properties can be accounted for by Brentano'sthetic vs. categorical distinction. While I argue that the *for*-phrase should be analyzed as a

PP by default in most cases, I also identify particular grammatical conditions in which it can be interpreted otherwise. I characterize the *tough* infinitival phrase as a gapped VP complement, attributing its apparent adjunct properties to this syntactic peculiarity.

I argue that *tough* sentences may be illustrations of four different lexical constructions based mainly on the interpretation of thethetic vs. categorical readings, and on the form and function of the *for*-phrase. I show that these four lexical constructions inherit a single abstract *Tough* Coinstantiation construction, which I demonstrate is both similar to and different from the extraction and control constructions. The differences demonstrate that the *Tough* Coinstantiation construction should be treated as an independent structure. The commonalities indicate that these three constructions inherit perhaps a more abstract construction, more directly connected with each other than was previously assumed in frameworks other than CG.

This case study casts doubts on some common assumptions of grammatical theory and illuminates the desirability of a more flexible grammatical theory such as CG.

*This small project is dedicated
with my love
to The Sacred and Immaculate Hearts,
the only source of my salvation.*

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Chapter 1 Introduction

The main purpose of this study is to propose a new analysis of the *Tough* construction in the English language. This analysis is couched within the non-modular, non-derivational, unification and inheritance-based framework of Construction Grammar.

The *Tough* construction (e.g. *John is easy for me to please.*) refers to a structure in which a small class of adjectives – *tough* adjectives – such as *tough*, *easy*, etc. has a matrix subject which is notionally understood as the 'missing' object of a verb or a preposition in an embedded infinitival phrase.

Since Lees (1960) first put his fingers on the *Tough* construction as one of the constructions that can be better understood in terms of a transformational rule, the study of the *Tough* and its associated extraposition constructions has contributed crucial arguments to the development of an architecture of a generative syntactic system.

The single most distinguished question around which the study of the *Tough* construction has revolved is what the syntactic and semantic relationships are between the matrix subject and the missing argument of a predicate in the infinitive phrase. This question has other ramifications.

For example, how can the existence of a missing argument position be accounted for? Is the creation of such a position made by moving an otherwise occupied argument? How do we know? What component of grammar is responsible for creating such a position? Does this creation have

any bearing on the semantic content of the matrix subject? What determines the semantics of the matrix subject? To what extent, if at all, does the meaning of the *tough* adjective determine the semantics of the matrix subject? What are the syntactic and semantic relationships of the *for*-phrase to other constituents, especially to a *tough* adjective and an infinitival phrase? What, in turn, are the syntactic and semantic relationships of an infinitival phrase to other constituents such as a *tough* adjective and a matrix subject? I attempt to answer these questions, among others, in this study.

Chapter 2 introduces the theoretical framework of Construction Grammar. It provides conceptual and technical background for the analyses presented in Chapter 5. In particular, I show how Construction Grammar represents a construction in terms of its feature structures and the unification of these structures, and how it relates a construction to others in terms of constructional inheritance.

Chapter 3 traces the history of the study of the *Tough* and its related extraposition constructions within a generative grammar framework. As a comprehensive overview, it includes both transformational vs. non-transformational and structural vs. lexical approaches. Transformational vs. non-transformational approaches differ from each other in terms of how a 'missing' object is created, i.e., whether it is created by movement- or base-generation. Structural vs. lexical approaches differ from each other in terms of what is responsible for the 'missing' object, i.e., whether the presence of a

'missing' object depends on the presence of the matrix subject or of the *tough* adjective. Further distinctions are made regarding each approach.

Chapter 4 concentrates on five major theoretical issues that have been only sparsely addressed in the history outlined in Chapter 3 and that are pivotal to a better understanding of the *Tough* construction. I devote a section of the chapter to each of these issues. Section 4.1 investigates the nature and generation of the 'missing' object, i.e., whether the missing object should be interpreted as an 'extracted' argument or as a 'controlled' argument. Having first established that the *Tough* construction has traditionally been identified in generative syntax either as a species of extraction or as a species of control, I then review the arguments in favor of each of these two accounts. By identifying properties that are hard to rationalize in terms of either account, I argue that the *Tough* construction is neither extraction nor control, but rather exemplifies a third independent grammatical pattern that happens to share one salient grammatical property with the two other accounts.

Section 4.2 addresses the semantic relationship between the matrix subject and the *tough* adjective, i.e. whether the *tough* subject has a semantic content with respect to the *tough* adjective. Historically, *tough* adjectives have been identified in generative syntax either as raising predicates or as control predicates. I argue, however, that *tough* adjectives are basically raising predicates that show certain properties of control predicates in specific syntactic conditions. I also argue that these apparent control properties may be accounted for by Brentano's thetic vs. categorical distinction.

Section 4.3 investigates the problem of syntactically categorizing the *for*-phrase in the *Tough* construction. The *for* + NP sequence has been analyzed mainly either as a PP of a matrix clause or as a combination of the complementizer and the subject of an embedded clause. I argue that the *for*-phrase should be analyzed instead as the former by default, but that there are indeed some cases in which it should be analyzed as the latter. I identify particular syntactic, semantic and lexical conditions that invite a complementizer reading.

Sections 4.4 and 4.5 concern the *Tough* construction's infinitival phrase. In section 4.4, I consider the syntactic categorization of the infinitival phrase, i.e., whether the *tough* adjective subcategorizes for a VP, an IP, or a CP. Drawing on empirical and theoretical evidence, I show that the VP analysis provides the most convincing arguments and that the other two analyses – IP and CP – are unconvincing as alternates.

In section 4.5, I investigate the grammatical function of the infinitival phrase which previously had been distinguished either as a complement or an adjunct to a *tough* adjective or adjectival phrase. I show that the infinitival phrase has properties of both a complement and an adjunct. I argue that the infinitival phrase is a special species of complement that requires a missing argument. It may be this syntactic peculiarity that makes the phrase distinct from a vanilla complement, and apparently similar to an adjunct. Throughout Chapter 4, I show that all these issues cannot be explained solely in terms of either syntax or semantics but can be properly

understood only as a manifestation of a complicated interaction of syntax, semantics, lexicon, and pragmatics.

Chapter 5 focuses on how Construction Grammar accounts well for the main characterizations of the *Tough* construction I make in Chapter 4, as well as for other detailed constraints introduced in Chapter 5. I argue that *tough* sentences may be illustrations of four different lexical constructions based mainly on the interpretation of thethetic vs. categorical readings that *tough* adjectives evoke, and on the form and function of the *for*-phrase with respect to a *tough* adjective. I present each construction in detail by comparing them in terms of syntactic, semantic, valence and sometimes pragmatic information. I also demonstrate how examples of *tough* predicates can vary widely from one to another in syntax, semantics, and valence by an illustration of a noun phrase that is similar in meaning to *tough* adjectives: *a breeze*.

After presenting four different lexical constructions of the *tough* adjective, I show that these constructions inherit a single abstract construction, the *Tough* Coinstantiation construction. I then show how the *Tough* Coinstantiation construction is both similar to and different from the extraction and control constructions in terms of argument construal, long-distance dependency, and valence structure. The differences demonstrate that the *Tough* Coinstantiation construction should be treated as a structure independent from extraction or control; the commonalities indicate that these three structure are more directly connected with each other than was

previously assumed, inheriting perhaps a more abstract construction. I also show that these claims, due to their inherent conception and grammatical architecture, cannot be explicitly or easily made within certain other frameworks.

Chapter 6 provides conclusions and the future work promoted by my research thus far.

Chapter 2 Theoretical framework: fundamentals of Construction Grammar

This chapter sketches the theoretical framework of Construction Grammar (CG) within which a new analysis of the *Tough* construction is couched.¹

However, the chapter is not intended for covering every aspect of the framework; its attention will be restricted to the conceptual and technical details necessary to provide background for the analyses presented in later chapters.

2.1 Construction Grammar, constructions, and constructs

Grammar is the knowledge or information about language that enables speakers and hearers to produce or understand linguistic expressions in their language. From a CG perspective, the linguistic features that make up grammatical knowledge are constructions: the grammatical unit in CG is the construction.

Constructions (patterns or rules) are often a conventional pairing of 'form' and 'meaning'. Form refers to phonological, morpho-syntactic or structural information. Meaning refers to interpretive information that is tied to the peculiarities of particular morpho-syntactic forms. Meaning thus includes not only conventional semantic knowledge not attributable to general mechanisms of semantic compositionality, but also pragmatic information not attributable to conversational reasoning, such as information structure, speech formulas, register information, etc.

¹ This chapter heavily borrows ideas presented in Kay 1995, 1998, Fillmore & Kay 1995, and Kay & Fillmore 1999.

Constructions include not only grammatical but also lexical constructions. Grammatical and lexical constructions differ only in the degree of richness or complexity of linguistic information, and they are thus treated in a uniform way. Unlike many other grammatical theories, CG assumes no strict separation of the lexical component of grammar from non-lexical components of grammar.

A construction is thus an amalgam of phonological, syntactic, semantic, pragmatic and lexical information.² A construction is set up in grammar when properties of form or meaning or both are not entirely predictable from the properties of other constructions that already exist independently in the rest of the grammar.

A construction, or often a combination of constructions, licenses constructs, i.e. words, phrases, clauses or sentences. While constructions are grammatical objects of linguistic description, constructs are linguistic expressions licensed by a construction or combination of constructions.

Since there is in principle no sharp distinction between the lexicon and the syntax as is commonly held, and every building block in grammatical theory in CG is treated as a construction, the 'standard' view of the organization of grammar may be understood as follows.

Grammatical rules are constructions. For instance, phrase structure rules are constructions that usually consist of more than one daughter. Principles that generalize over rules may be thought of as inherited abstract constructions.

² This does not mean that every construction has all these types of information. For instance, certain phrasal constructions (= phrase structure rules) lack lexical information, and some strictly syntactic constructions, such as Subject-Auxiliary Inversion (SAI), lack semantic information.

Morphemes are lexical constructions. They include minimal lexical constructions. Minimal lexical constructions are constructions consisting of a single constituent with idiosyncratic phonological, lexical, syntactic and semantic information. Fully specified lexical constructions are constructs that result from the combination of minimal lexical constructions with derivational and/or inflectional morphological constructions.

2.1.1 Is CG a study of idioms?

Given such a definition of construction, the Construction grammarian's concern is to tease out from the rest of the grammar those grammatical properties that are not strictly predictable.

If we think of an idiom as those grammatical properties of a linguistic expression which are not accounted for by its component parts or by rules in the rest of the grammar, the study of constructions is, in a sense, a study of idioms. However, since an idiom is in principle defined and postulated only after looking into all possible rules that might be relevant to license the structures that illustrate it, the study of idioms presupposes the study of general grammatical rules in the language at issue, and vice versa. That is, in order to decide whether or not a certain string is a well-formed construct, a grammarian should, explicitly or implicitly, know all of the constructions in the language that are possibly involved in the production of that construct and know whether any combinations of those constructions license or do not license the given string as a construct of the language. The study of constructions is thus the study of idioms.

In this sense, the pattern that builds an English sentence out of a finite verb phrase preceded by its subject is an idiom.

2.1.2 Types of constructions

CG defines an extensive range of constructions, and the types of constructions are highly varied. For instance, some constructions are so general that they do not inherit properties from higher-level abstract constructions, and can only be shared by other, more specific constructions (e.g. English XH constructions³). On the other hand, some are so specific that they share only the properties of higher-level constructions not shared by more detailed constructions (e.g. lexical constructions). Many constructions consist of a local tree with a single mother and its daughter(s) (e.g. the English VP construction), but a few consist of an extended tree in which the relationship between the grammatical elements involved extends beyond a local tree (e.g. the English correlative construction). While most constructions stipulating more than a single constituent consist of a mother and its daughters (e.g. phrasal constructions), others consist of a mother and a single daughter. These are among the lexical constructions. Some constructions fail to order every sister with respect to every other (e.g. the English VP construction). Others only specify order (e.g. the English 'Heavy NP shift' construction). Some constructions encode

³ See section 2.8.2.

only syntactic information, while others encode semantic, pragmatic, and lexical as well as syntactic information.

2.2 Goals of CG

Given such a variety of constructions, CG does not take the position that there is a clearly defined set of grammatical data or phenomena which takes precedence in describing and illuminating aspects of a universal as well as a particular grammar. That is, there is no core vs. periphery distinction, as in Principles and Parameters theory. Grammar simply consists of a cline of constructions from more general to more specific. Every piece of grammatical data, either productive or idiosyncratic, is thus of equal importance, and every grammatical phenomenon of a language deserves equal consideration in the description of the language.

The Construction grammarian's goal is thus to account for, in principle, each and every property of grammatical knowledge within and across languages without sacrificing the idiomatic phenomena of a language, and at the same time without losing linguistic generalizations. That is, the goal is to make a complete inventory of all of the constructions, and to specify any relevant relations that may exist between constructions in a language.

In practice, however, CG grammarians are sometimes more interested in idiomatic grammatical constructions since this study has been neglected and can often shed light on the 'core' constructions with which they must collaborate in licensing sentences.

2.3 Psycholinguistic issues in CG

Since grammar consists of those properties that do not fall out from other rules of the language, within a CG perspective, children acquire a language by learning a repertoire of grammatical constructions. Children are held to acquire individual constructions in order to encode or decode the form and meaning of linguistic expressions.

CG assumes that constructions are mental objects of linguistic information that are learned individually by children, and not simply an epiphenomenon of the interaction of general principles.

As mentioned, CG's main concern is to build a precise and complete grammar that reflects the grammatical knowledge of language users, but CG is also open to the issue of building a performance-compatible theory of grammar. In other words, CG is a grammatical model that is sensitive to constructs as well as constructions. When constructs are parsed, the addressee is assumed to decompose individual constructs into a set of constructions whose combination licenses those constructs.

2.4 Grammatical data in CG

To achieve these goals, CG grammarians have as equal an interest in linguistic data attested in corpora as they do in data elicited from native speakers or invented by the researchers themselves. In other words, CG is as concerned with linguistic data that is actually used in linguistic situations as it is with a native speaker's intuitions.

2.5 Characteristics of CG

CG may be characterized as outlined in the following.

2.5.1 Non-modular grammar

In a modular approach, grammar consists of a set of independent modules, each of which has its own well-formedness constraints and which interacts with other modules in limited ways. The form and meaning of each grammatical unit, for example, belong to different components of grammar, and syntactic and semantic constraints are satisfied in separate ways. The integration of form and meaning is achieved via correspondence rules between the modules.

In a constructional approach, however, grammar has only a single module consisting of a collection of constructions. The form and the meaning of each grammatical unit do not constitute separate components of grammar that are treated separately. Rather, they are part of grammatical constructions, and are treated as a single object of linguistic description.

2.5.2 Generative grammar

CG is a type of generative grammar in that it strives for an explicit and precise account of the grammatical knowledge of native speakers of a language, usually as manifested in actual speech. CG thus aims to provide grammar with constructions that license all and only the actual constructs that contribute to this

language. In other words, CG aims to account for every well-formed construct and its structure, while ruling out every possible ill-formed construct. To achieve this goal, CG develops an explicit representational system to represent productive and non-productive constructions equally well, and to capture linguistic generalizations between them; we will return to this system in section 2.6.

2.5.3 Non-derivational grammar

In a derivational theory of grammar, a given string is well-formed if its final structure is obtained from an initial structure through a series of intermediate representations. A given string is ambiguous when there is more than one derivational way of analyzing its structure.

In CG, a given string is well-formed when its structure is licensed or analyzed by a construction or a combination of relevant constructions of the grammar. It is ill-formed when its structure is not licensed by a construction or a combination of constructions. A given string is ambiguous when its structure can be analyzed in more than one way by one construction or combination of constructions.

CG resembles many other current surface-oriented, monostratal approaches to grammar including HPSG, LFG, and Word Grammar in that it rejects any kind of derivation in licensing well-formed constructs.

2.6 Formal objects of the representational system in CG

One of the advantages of CG is its assumption that the grammatical apparatus that is available to explain more productive grammatical patterns should be equally useful to the explanation of more idiosyncratic ones.

The characterization of grammars sketched in section 2.5 is achieved by an explicit formal apparatus that provides for the representation of idiosyncratic as well as general constructions. In other words, the formal mechanism in CG provides a smooth and natural connection between descriptions of relatively general constructions and those of relatively idiomatic constructions.

The formal descriptive tools CG employs include constituent structures, feature structures, feature structure unification, and the operation of constructional inheritance.

2.6.1 Feature structures

A feature structure (FS) consists of pairings of attributes (or features) and their corresponding values. It can be either simple or complex depending on the nature of the value. A simple FS is one whose value is atomic. A complex FS is one containing a feature whose value itself consists of an FS. A series of embedded FSs is thus possible. That is, the recursive potential of FSs facilitates the embedding of FSs as values within other FSs.

An FS may encode, with constraints, virtually any kind of grammatical information. Any information associated with a constituent structure except for constituency itself may be represented in terms of FSs, and the features in FSs

may be syntactic, semantic, pragmatic, or lexical. At the same time, however, FSs are highly constrained. An attribute in FSs has exactly one value. FSs in CG are represented by attribute-value matrices (AVMs).

2.6.2 Unification

Unification is the superimposition of FSs. As long as their values do not contradict each other, FSs can be unified to produce another FS that combines the initial FSs. Many structures whose relevant linguistic properties are not in conflict can be unified.⁴

The representation of unification is indicated by the occurrence of the same unification index, a pound sign (#) followed by a specific number in two AVMs.⁵ The notion of unification as an operation on feature structures can be generalized such that not only can a feature structure unify with another feature structure, but also a construction can unify with another construction.

Since unification is available to lexical, as well as grammatical constructions, it provides a means for giving uniform treatment to these constructions.

⁴ This does not mean that all linguistic knowledge can be represented in terms of the operation of unification. There are certain cases where unification does not apply. For example, there are cases in which relevant linguistic properties may already be specified (e.g. certain collocational expressions). In addition, one structure more or less depends on other structures in some cases (e.g. negative polarity contexts).

⁵ Unification is defined to include in the resulting AVM all the attribute-value pairs of each of the unified AVMs. Hence, in unifying AVMs, all the information is, by custom, written in only one location, and the empty information in other corresponding location(s) is read in conjunction with the ones that have the same unification index.

2.6.3 Inheritance

A construction A inherits a construction B if and only if A contains all the information B contains, both constituent and feature structures, and (in the non-vacuous case) more features. A more abstract construction can be inherited by a more specific construction.

The rationale behind inheritance is to capture generalizations across constructions by specifying similarities among them. For example, numerous constructions inherit SAI, such as Yes-NP question, Negative Preposing, Exclamatives, Non-subject WH-question, and so on. Inheritance also plays a significant role in the characterization of lexical constructions. Fully formed lexical words are usually licensed by the inheritance of morphological and linking constructions.

Since many of the properties manifested in a more detailed construction are inherited from more general constructions, the representation of more detailed constructions need not specify much of their information but only contain the idiosyncratic information restricted to those constructions. Inheritance thus allows us to capture relations between constructions of the most general and the most idiosyncratic types in a succinct, non-redundant manner.

The operation of inheritance is marked by the notation 'inher', followed by the name of the inherited construction, at the top of the inheriting construction.

2.6.4 Constituent structures with feature structures

The primary formal object of the representational system in CG, as in other grammatical theories, is constituent structures. However, a constituent structure in CG are different from those of the traditional kind in transformational grammar mostly because there is an FS associated with each of its nodes.

2.6.5 Feature structure trees

Both constructions and constructs are represented in terms of constituent structures annotated with feature structures, i.e. feature structure trees (FTs).

Constructions are formally defined as partial descriptions of FTs that simultaneously satisfy linguistic constraints at various levels: (1) the number of nodes of a constituent structure may be infinite; (2) linear precedence relations between sister nodes may be incompletely ordered; and (3) terminal nodes may not be lexical. On the other hand, constructs are formally defined as complete descriptions of FTs: (1) the construct has a finite number of nodes; (2) every sister node is ordered by linear precedence; and (3) all of its terminal nodes are lexical. While constructions allow some unspecified values (variables), constructs do not permit any unspecified values.

A combination of constructions, then, is formally a combination of FTs.⁶ More exactly, the product of a combination of constructions may be defined as a

⁶ 'Combination' can be interpreted in a non-technical way in the ambiguous meanings of 'process of combination' or 'product of combination'.

construction which results from a combination of constructions, and the FS at each node in a resultant construction is the unification of the FSs at each node in the original constructions. In effect, the resultant construction has all the nodes of original constructions, and all the Immediate Dominance and Linear Precedence relations of the original constructions. In other words, all of the information in the resultant construction is present in each location in the original constructions.

Generalizations across constructions may be captured by means of inheritance hierarchies, i.e., constructional inheritance. Since generalization can occur on more than one dimension of linguistic information, there might be a multiple network. Because they are made up of a network of multiple inheritance hierarchies, constructions constitute a highly structured set.

2.6.6 Unification procedures

To achieve a non-procedural characterization of grammatical descriptions, CG adopts, in principle, a methodological practice to the effect that the process of unification should be carried out in declarative and monotonic manner, as is widely done in non-transformational approaches.

The procedure is declarative in the sense that the process of unification is not procedural, but can be made in any linear order, producing the same result.

The procedure can also be monotonic, in the sense that constraints of a more general construction affect all instances of more concrete constructions that inherit them without exception. New constraints or conditions can be added to more concrete constructions; they may not change or replace existing ones. In other words, overrides (= conflicting constraints of an inherited structure taking

precedence over features which would otherwise be inherited from a more general structure) are restricted or ruled out.⁷

2.6.7 Psycholinguistic claims about the formal representational system

CG makes the assumption that since the formal representational system and its constituent objects model elements of a native speaker's grammatical knowledge, they are well-suited to a description of natural languages. The formal representational system has a psycholinguistic reality of its own so that it can be interpreted as reflecting or providing insights into the nature of innate human linguistic abilities. The formal features that CG argues to be relatively universal include phrase structure, some syntactic categories, and the mechanism of inheritance.

In the CG view, children are thus assumed to gradually acquire a considerable amount of a representational system which contributes to a process of 'on line' production and interpretation of utterances.

2.7 Feature architecture in CG

A finite inventory of features is posited⁸ in order to properly describe the

⁷ However, this does not mean that all linguistic phenomena are monotonic. It implies only that when linguistic phenomena are described in terms of monotonicity, the description might shed light on otherwise vexing problems.

⁸ For details, see Chapter 5, Fillmore & Kay 1995.

formal objects in CG. The feature architecture,⁹ for instance, for a head
 predicator¹⁰ is as given in Figure 1.

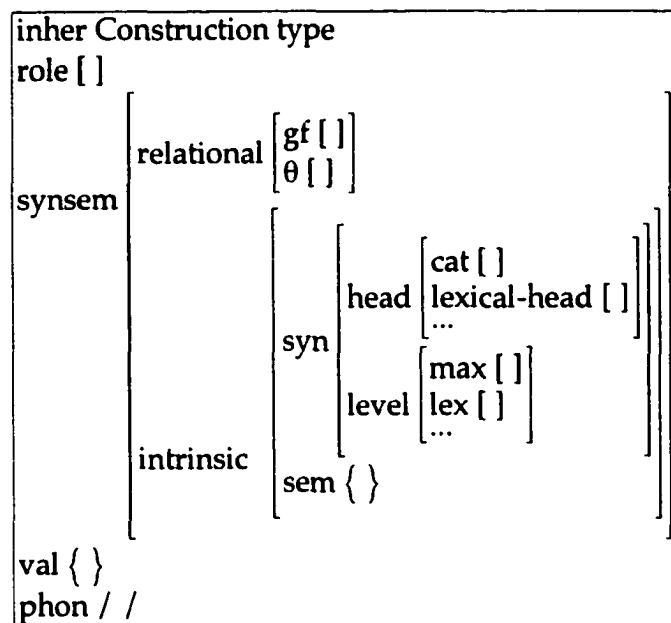


Figure 1. Schema for feature architecture

Before discussing each feature in Figure 1, a few preliminary remarks about symbols are in order. First, at the top of the box, the name of any construction which is inherited by the one being diagrammed is sometimes listed by means of the notation 'inher X', where X represents the name of the inherited construction. The notation might be understood as calling for the mentioned construction to contribute its information to the inheriting construction. Second, the box diagrams represent constructions. They correspond to tree diagrams in other frameworks. Third, empty brackets '[]' represent an unspecified value,

⁹ For other types of general schemata, such as two-part phrasal constructions, see Fillmore & Kay 1995.

¹⁰ The term 'predicator' is defined in such a way as to include complements of copulas and secondary predicates, as well as vanilla verbal predicates.

and empty braces '{ }' represent a set of unspecified membership. The ellipses represent specified but unmentioned grammatical information.

The highest features in the hierarchy are *role* (= phrasal role), *synsem* (= syntactico-semantic information), *val* (= valence), and *phon* (= phonology).

While *synsem*, *val*, and *phon* features are available to lexical as well as phrasal constructions, the feature '*role*' is restricted only to phrasal constructions.

2.7.1 Phrasal roles

The function of a phrasal role (or simply '*role*') is to specify how a phrasal daughter is related to the other daughter(s) within a larger phrase. For instance, in a headed phrasal construction in which one daughter plays a significant role in characterizing a phrase, daughters can be divided into a head and non-heads. The non-head daughters may be fillers, modifiers, specifiers, or markers, depending on their relation to their head.

Fillers are arguments that fill or satisfy requirements of their head. They include complements, subjects, and '*extracted*' elements. Complements are arguments that are sisters to a lexical head. A subject is an argument that is a sister to a maximal or single-word VP. '*Extracted*' elements are arguments which are not syntactically realized in an otherwise '*canonical*' position, but which occur in a non-canonical position. Modifiers are phrasal roles that modify lexical heads. Specifiers are phrasal roles that specify phrasal heads. Markers are phrasal roles that have a syntactic marking function but do not contribute any semantic content.

2.7.2 Synsem features

Synsem features are properties that characterize the syntax and semantics of a given constituent independent of their context. Synsem features are subclassified as intrinsic or relational. Intrinsic features are properties inherent to a given category, and relational features are properties that a given category has in a given syntactic and semantic environment.

2.7.2.1 Relational features

Relational features identify the relational status that a constituent may host with respect to a given predicator's valence requirements,¹¹ and hence are distinguished from 'role' features mentioned above. That is, in terms of role features, the relations are specified between sisters in a phrase, whereas for relational features, the relations are assigned by virtue of properties of valence sets.

The values of relational features are grammatical functions (gf), and thematic roles (theta, θ).¹² The grammatical functions in CG are subject (subj), object (obj), and complement (comp). The reason for keeping the number of gf's to three is that a canonical English sentence has exactly one subject, at most one

¹¹ See 2.7.3 for valence.

¹² In addition, in other languages, case features may represent relational roles, as opposed to morphosyntactic information.

object, and any number of complements.¹³ The subject is an argument that participates in subject-verb agreement. The object is an argument that immediately follows a verb, and sometimes can be alternatively assigned to the subject of a passive sentence. Everything else is a complement.¹⁴

Theta roles are the semantic roles of constituents assigned by a predicator relative to the other major constituent(s).¹⁵ As in other theories, the values for theta roles typically include agent, patient, experiencer, stimulus, content, etc. CG usually adopts more general notions of theta roles.

CG also assumes that theta roles may be associated with more specific types of schemas. That is, the names of the values of the theta roles are relative to the individual theta frames. A theta frame is a structured set of theta roles, which represents a conceptualization or a schematization of an event, or a state of affairs. For instance, the Action Schema consists of Agent, Instrument, and Patient roles. The Motion Schema consists of Theme, Location, Source, Goal, and Path roles. The Experience Schema consists of Experiencer, Content, and Stimulus roles. The theta-frame hypothesis has the advantage of making it unnecessary to list and order all unique names for all of the frame elements that we are likely to come across.¹⁶

¹³ More than one complement NP can be distinguished by mentioning the specific form of a head. There is also a distinction made between optional and obligatory complements. Optional complements are adjuncts, and obligatory complements are arguments.

¹⁴ Note that the theme argument of a ditransitive (=direct object) is termed a complement, rather than an object.

¹⁵ CG assumes that the association of frame-specific roles with theta roles is prespecified in the lexical constructions, while the association of theta roles with grammatical functions is dealt with in the grammar in terms of linking constructions.

¹⁶ Relationships between individual theta frames can be captured in terms of inheritance to the extent that there are important cognitive relationships among frames.

CG, however, does not exclude the possibility that there are certain frame-specific roles evoked by certain predicates.¹⁷ However, to the extent that we are convinced that there are important cognitive relationships among frames, relationships between frames are expressible in terms of inheritance.

2.7.2.2 Intrinsic features

Intrinsic features are divided into syntactic (syn) and semantic (sem) features.

2.7.2.2.1 Syntactic features

Syntactic features are divided into head and level features.

2.7.2.2.1.1 Head features

Head features refer to properties that play a central role in the determination of the syntactic behavior of a phrasal mother. Head features are shared by a mother constituent and its head daughter.¹⁸

¹⁷ For example, Fillmore and Atkins (1992) argue that the semantics of the verb 'risk' generates specific thematic roles confined to the scene of 'risk'.

¹⁸ CG sometimes needs, however, to mention a semantic head, as opposed to a syntactic one. Copulas, for instance, are syntactic, but not semantic, heads, since they are devoid of any semantic content.

One such head feature is the category (cat) feature, which roughly corresponds to a part of speech in traditional grammar. The feature 'cat', however, is different from a traditional part of speech in that it has internal structure. Grammatical categories may consist of a feature structure so that certain syntactic distributions and behaviors can be accounted for. Prepositions, for instance, can be further divided into contentful (predicative or non-predicative) and semantically null case-marking prepositions in fixed verb-preposition collocational patterns. The latter type of preposition, for instance, cannot participate in the Subject-Predicate construction since it is not a predicator.

The most remarkable head feature in CG is the lexical head (lexh). The value of this feature is the name of the head lexeme. Its function is to refer to a phrase by its lexical head. The advantage of the feature is to facilitate the characterization of certain collocational patterns while maintaining the locality principle, which states that lexical items cannot select for properties of daughters of the elements for which they subcategorize. The feature 'lexh' is projected from a lexical item to its maximal phrase. For instance, the information that a verb like *keep* requires a prepositional complement whose lexical head is *from*, is mentioned as the value of the lexical head attribute. In other words, CG may identify a phrase in terms of a lexical head which is referenced by the lexh feature.

2.7.2.2.1.2 Level features

Level features refer to the degree of completeness of a given constituent. They include lexicality and maximality. Lexicality (lex) identifies whether or not a given constituent is a word. For instance, the pluralization construction in

English distinguishes lexical forms from non-lexical forms since it can apply only to lexical nouns.

Maximality (max) identifies whether or not a given constituent is complete enough to serve as a major constituent of a sentence (e.g. subject, object) and is, in that sense, a phrase. Note that lexicality and maximality are independent features so that a certain item can have both features. For instance, a pronoun or proper noun¹⁹ is both [max +] and [lex +].

The function of lexicality and maximality thus corresponds roughly to that of X-bar theory. They are not, however, the same formal objects. CG does not always assume a binary branching structure or a unary branching structure unless required by independent constructions with special constraints and semantic interpretations.²⁰ In other words, any unnecessary branching is strictly prohibited in CG. This is due to the main theoretical tenets of CG, namely strict unification and empirical motivation of theoretical or formal objects.

Some other level features are particular to given syntactic categories, and are not represented in Figure 1. These include 'srs', 'sealed', 'loc'. 'Subject requirement satisfied', or 'srs', is a level feature for a predicator, and is employed to distinguish a sentence whose subject requirement is present or interpreted from a VP or a controlled non-verbal predicator (= AP, PP, NP). Sentences are marked [srs +], while VPs or predicative complements are marked [srs -]. Phrases marked [srs -] have their subject instantiated in terms of predication in the case of

¹⁹ Mass nouns and plural count nouns have unspecified maximality, thus allowing them to occur as major arguments, where [max +] is required, or as the heads of determined NP, where [max-] is required.

²⁰ For instance, the mass-count noun conversion or adjective-noun conversion constructions, for example, show unary branching.

VPs or have their subject valence element satisfied in terms of control in the case of predicative complements.

'Sealed' is another level feature that is specific to particular constructions. It does the work of 'island' constraints in transformational grammar. If some construction is marked [sealed +], for example, it means that nothing can be 'extracted' out of the structure.

Locality (loc) is another level feature. An FS 'loc +' indicates that a constituent cannot be extracted. Note that 'loc' is different from 'sealed': in the case of the former, the constituent cannot itself be extracted, and in the case of the latter, nothing can be extracted from the constituent.

2.7.2.2.2 Semantic features

Semantic features may represent simple semantic properties such as animacy, boundedness, etc., but in many cases refer to semantic structures of a more complicated kind – those associated with semantic frames. CG assumes that semantic features have the values of scenes and entailments, and that these semantic values constitute flat structures of FS sets.

A scene consists of some specific idealized frame (frame) whose conceptual structure is evoked by a predicator, and arguments (args) that participate in the frame.

Each frame thus represents a predication, which consists of a set of frame elements – participant roles that manifest themselves significantly in the syntax or semantics of the frame. Each predication is indexed so that it may appear as an argument for another predication.

With this cross-referencing, the FSs of predications can be embedded within each other so that scopal relations between predications can be represented. One advantage of this embedding of semantics is that it allows the expression of 'semantic inclusion' relations between one semantic object and another. A sentence's semantics, for instance, includes all aspects of its VP's semantics, which in turn includes all properties of its verb's semantics.

The purpose of entailment in the semantic description is to indicate that the level of the conceptual analysis of certain lexical items can be detailed.

2.7.3 Valence features

2.7.3.1 Valence, valence elements, and valence sets

Predicators, verbal or non-verbal, impose requirements on what kinds of co-occurring linguistic expressions must occur with them in a sentence. These requirements are called valence, and the linguistic objects of these requirements are called valents or valence elements.

Conceptually, the valence of a predicator can be thought of as the set of participant roles in any scene that exhibits the state of affairs designated by the predicator. It has as its value a set of FSs, hence, a valence set.

The members of valence sets are provided as the combinatorial requirements of a predicator: the syntactic categories a valence element belongs to, its semantic properties, and what subcategorization it has of its own are indicated, when relevant. These requirements, the so-called arguments, come 'off the shelf' with the predicator that is involved. Adjuncts can also participate as valence elements by way of valence augmentation.

A valence set is initially associated with the verb, but since it refers to the basic syntactic and semantic structure of the entire sentence, it is transmitted or projected first to the VP and then to the sentence as a whole. Valence bearers can be lexical or phrasal heads.

The valence elements need not be semantic arguments of a predicator; they can be strictly syntactic in nature. Although there is a close interrelationship between a predicator's semantic requirements and its syntactic requirements, one-to-one matching is not assumed. Valence elements – semantically empty syntactic elements such as the dummy subject *it*, for example – may have no corresponding semantic interpretation. They can also be semantically understood but syntactically missing, as in the case of the understood subjects of imperatives.

Note also that a valence element can be a predicator of the next lower clause. This case, which we refer to as valence commanding or embedding, will be dealt with in more detail below.

2.7.3.2 Valence alternation

2.7.3.2.1 Minimal vs. full valence

CG makes a distinction between minimal valence and full valence. The distinction depends on whether or not the valence specification includes the grammatical function information of the valence elements. A minimal valence contains only information on semantics that automatically comes with a lexeme, i.e., a minimal lexical entry. A full valence additionally includes information about grammatical function that accompanies the completely filled out valences of a lexical form, i.e., fully specified lexical entries. For example, active and

passive forms of a given transitive verb have the same minimal, but different full valences because grammatical function is not assigned.

The motivation for distinguishing minimal from full valence is to capture linguistic generalizations across grammatical functions. Since there is some redundancy or predictability with respect to the co-occurrence of grammatical functions, semantic roles, and syntactic forms, it is possible to make the information contained in lexical entries less cumbersome by distinguishing that specification of valence information which can be predicted from the remaining information.

The relationships between the minimal valence of a lexeme and the full valence of its various lexical forms are captured by the process of linking, a syntactico-semantic interface notion. Linking has the general function of assigning grammatical functions to semantic arguments; however, there might be exceptions to linking constructions of this general type, e.g. the alternation in mapping between semantic arguments and grammatical functions. These exceptions are handled by specifying that the association between a semantic argument and a grammatical function and its associated syntactic form is pre-linked in the minimal valence so that they do not participate in the general linking constructions. Some linking constructions thus determine even the morphosyntactic shapes of the semantic arguments.

2.7.3.2.2 Minimal vs. augmented valence

One of the remarkable aspects of CG is that adjuncts are treated as valence elements. While arguments are valence elements of the minimal lexical

predicator, adjuncts are treated as augmentations of the valence set. The idea is that while a minimal valence only constitutes a part of the valence set that characterizes the phrase headed by a given predicator, a phrase made up of a lexical head and its sisters has a valence set that contains the valence set brought by the head, and may have extra elements which include optional adjuncts. These extra valence elements are considered augmentation of the verb's valence since adjuncts are expressions which usually show up within the verb phrase, but which are not reflected in the valence of the lexical verb. In other words, adjuncts do not accompany a minimal lexical verb, but are created by being added to the semantics and valence values of a phrase that is headed by a lexical verb. The creation of adjuncts is done by means of particular adjunct licensing constructions, which unify either with a minimal lexical verbal construction or a VP. There are two means of augmenting a valence: expanding the valence of a lexical head, or expanding the valence of a phrase that is headed by a lexical head.

Adjunct-licensing constructions can themselves furnish the adjunct constituent with whatever properties it needs to have. They include setting constructions and frame-elaborating manner constructions. Setting constructions provide verbal constructions with the temporal, spatial, or hypothetical settings which contain them. Frame-elaborating constructions provide verbal constructions with a more detailed manner characterization. The semantics of an adjunct is incorporated into the semantic structure of the VP that contains it, and ultimately of the clause as a whole. In other words, these adjunct constructions add an adjunct element to the valence set of maximal verbal constituents. That is,

they unify the semantics of the adverbial element with the external semantics of that verbal constituent.

Adjuncts occur either locally (= in situ) or non-locally (= extractable), perhaps in the form of a fronted interrogative word or a fronted topic phrase.

2.7.3.3 Valence satisfaction

Valence elements are satisfied in one of two ways: (1) there is a constituent somewhere in the sentence whose external synsem values unify with the element, or (2) the element is satisfied by a null complement construction. (1) includes local, distant, double, and co-instantiation, and (2) refers to null instantiation.

In the case of local and distant instantiation, there is no discrepancy between the number of valence instantiations in a sentence, and the number of semantic valence elements in the sentence. In the cases of null instantiation and coinstantiation, there are fewer instantiating constituents in a sentence than its predicators have valence elements for. In the case of double instantiation, there are more instantiating constituents than semantic valence elements.

2.7.3.4 Types of valence satisfaction

2.7.3.4.1 Local instantiation

Local instantiation refers to instantiation in which a valence element is directly realized or instantiated by a constituent headed by its lexical predicator.

It occurs within the VP when the element bears the 'obj' or 'comp' function,²¹ or within a Subject-Predicate construction when the element bears the 'subj' function.²² That is, valence elements realized either as sisters or as nieces of lexical heads, or as sisters of a phrasal head, are instances of local instantiation.

2.7.3.4.2 Distant instantiation

Distant instantiation refers to cases in which a valence requirement is not realized locally, i.e., as a sister or a niece to a lexical head. A typical case occurs in inverted WH questions.

2.7.3.4.3 Double instantiation

Double instantiation refers to cases in which a particular syntactic argument is instantiated in an ordinary syntactic position with a semantically empty constituent – the so-called dummy *it*; it is also instantiated later in a sentence, in the form of an expression which provides its semantics. The typical case is seen in *it*-extraposition.

2.7.3.4.4 Coinstantiation

²¹ In the case of the 'comp' function, it can be realized either as a sister (in the case of predicative prepositions) or as a niece (in the case of null prepositions) of the lexical head.

²² We thus need to distinguish subjects from one or more local members, and zero or more non-local valence members. Local valence members are marked [loc +], and non-local [loc -], and a subject valence element is distinguished from other local complement members by being marked [gf subj].

Coinstantiation covers the cases traditionally known as Control and Raising. It is effected in CG by unifying, within the valence set of a predicator, the synsem value of one of the valence elements with the synsem value of the subject valence element of one of the other valence elements.

2.7.3.4.5 Null instantiation

Null instantiation refers to cases in which an argument, otherwise realized, is missing in a sentence. The semantic interpretation of the missing argument is provided via direct pragmatic information or via constructionally licensed pragmatic information. A canonical case is the imperative construction in which the subject is not expressed, but is interpreted as 'you'.

When pragmatic interpretation of a valence element is licensed by a specific construction, the construction is marked 'prag', specifying the person from whose point of view something is being expressed. By default, this point of view will be that of the speaker or the addressee.

When interpretation of a valence element is provided by general mechanisms of pragmatics, its instantiation is either indefinite, definite, or free. Indefinite null instantiation (ini) is a case in which the speaker omits mention of an argument without having in mind a particular participant which the hearer is supposed to identify. All instances of this null instantiation are lexically licensed, i.e., particular predicates either do or do not allow it. Definite null instantiation (dni) refers to a case in which the speaker omits mention of an argument, assuming that the hearer will identify the discourse participant that the speaker has in mind in the pragmatically given context. This type of instantiation can be

licensed lexically or constructionally. Free null instantiation (fni) refers to cases in which a missing argument may be identified with 'ini' or 'dni'. All examples of 'fni' concern people. Hence, in the case of 'fni', the missing element is interpreted as referring to people in general – to the speaker or the addressee, or to someone whose point of view is being represented in the sentence. This type of instantiation can be licensed lexically or constructionally.

2.7.4 Phon features

A phonology (phon) feature has as its value the morpho-phonological form of the word or phrase represented by a constituent. When the phrasal construction has more than one daughter, the phonology value of the mother node is a function of the phonology values of the daughters. For convenience, CG represents underlying phonological representations by enclosing in slashes an orthographic representation of the lexeme involved.

Note that CG distinguishes lexemes from lexical forms. A lexeme is an abstraction over each concrete lexical form, and its value will be filled in by unification with constructions defining word forms. Whereas a lexeme is a dictionary entry, a lexical form is a phonological form of the word representing a lexeme. For instance, *am*, *are*, *is*, *was*, *were*, and *been* are all different lexical forms of the same lexeme *be*. Lexical forms contain, along with phonological information, a large amount of grammatical information not contained in their lexeme.

Another essential feature of the distinction between the lexeme and its lexical forms is that particular assignments of semantic arguments to syntactic

functions vary across active and passive lexical forms of the lexeme, as briefly alluded to earlier. The valences of lexical forms are ordinarily more complete in this way than those of the corresponding lexemes. In most cases, the various lexical forms of a valence-taking lexeme assign a grammatical function to each semantic argument, while the lexeme itself does not make such an assignment.

2.8 Headed constructions in CG

There are two main types of phrasal constructions: headed and non-headed.²³ A non-headed construction does not have a daughter constituent that determines the character of the phase as a whole. Headed constructions have one daughter that participates centrally in determining the phrasal type of the mother.

Generalizations within and across headed constructions in CG are captured by principles or, in CG terms, inherited, abstract constructions. One advantage of this approach is that we can simplify the formal representation of constructions, and more importantly, we may capture the generalizations latent within the postulation of each individual headed construction. This is facilitated by abstracting and stating the headedness principles separately.

²³ Phrasal constructions can also be divided into coordinating and non-coordinating constructions. The former has more than one head, but the latter has only a single head. Here we will focus our attention on non-coordinating constructions, i.e. single-headed constructions.

There are four principles in CG that all headed constructions follow: the Head Feature Principle, the Subset Principle, the Valence Principle, and the Maximality Principle.

1. Head Feature Principle: the head attributes and values of a head daughter are shared with those of its mother.

The Head Feature Principle ensures that the head value of a lexical head daughter percolates up to the phrase headed by that lexical item. Head features include syntactic category features, lexical head features, and any associated morphological features. For example, if the category involved is a verb, then its inflected form, voice, etc. are head features, and are shared with its mother, VP, or S.

2. Subset Principle: the set values of a head daughter are subsets²⁴ of those of its mother.

Since the frame values and the valence values are sets, the valence of a head daughter is a subset of its mother's valence, and the frames of a head daughter are a subset of the mother's frames. That is, the Subset Principle says that the semantics and valence values of a phrasal mother include those of a head daughter and possibly more.

Recall that the semantics of a VP, for example, may contain more information than its head verb in terms of adjunct constructions. Recall also that adjuncts are treated as valence augmentations in CG, and that the Subset

²⁴ Not necessarily proper subsets.

Principle ensures that the semantics and valences of adjunct daughters not present in the head daughter can appear in the mother node.

3. Valence Principle: the synsem value of a local complement daughter is shared with that of the valence element of its mother.

The feature structure of each complement daughter unifies with a member of the valence value of the mother. In other words, valence members marked [gf subj] and [loc +] will unify with the subject daughter of the Subject-Predicate construction. Those marked [loc +] will unify with right sister fillers in the case of the Head Plus Complements (HC) construction, which will be discussed below. Finally, those marked [loc-] will unify with left-sister fillers in the Left Isolate construction, i.e. the so-called WH-extraction construction.²⁵

The function of the Valence Principle corresponds to that of the 'coherence' condition in LFG. CG ensures that all valence requirements are satisfied by requiring that the features of valence elements of all well-formed constructs must be specified either by unifying with the synsem of a filler constituent or by unification with a null instantiation construction.

4. Maximality Principle:
- a. Heads are [max -]
 - b. Complements are [max +]
 - c. Specifiers are [max +]

²⁵ A detailed description and account of the Left Isolate construction will be given in Chapter 5.

The Maximality Principle roughly corresponds to X' syntax of transformational grammar; however, the characterization of the former is different from that of the latter in at least two respects. First, CG posits no empty categories; vacuous stacking of 'bar-levels' or, in CG terms, vacuous unification of constructions, is prohibited.²⁶ Second, because of the first point, binary branching is not strictly enforced in every structure of X' syntax. Flat structures are hence preferred for certain types of constituent structures such as SAI.

Headed constructions of English can be divided into three general types: the Head Plus Complements (HC) construction, the XH construction, and the Modifier Plus Head (MH) construction.²⁷

2.8.1 The HC construction

The HC construction is a phrasal construction in which a left lexical head daughter is followed by one or more complement filler daughters that are sisters to a lexical head. The construction may be diagrammed as in Figure 2.

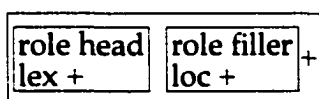


Figure 2. The Head Plus Complements (HC) construction

²⁶ Unless some semantic differences are observed in support of it, unary branching is not allowed. A proper noun, for instance, is not treated as an N, N', and N'' at the same time, but as an NP.

²⁷ The MH construction consists of a head word or phrase that is either preceded or followed by a modifier. It includes noun modification, verb modification, and relative clause modification.

Note that the notation Kleene plus²⁸ attached to the right-hand box indicates that the box can be iterated one or more times so that it can license one or more complements that follow a lexical head. The exact number of complements each individual member of the HC construction requires is regulated by the Valence Principle.

The HC construction is inherited by five more specific constructions: INV, the VP construction, the AP construction, the PP construction, and the N' construction, which license inverted clauses, verb phrases, adjective phrases, prepositional phrases, and noun-plus-complement phrases, respectively.

The VP construction,²⁹ for example, differs from its inherited HC construction only in that it specifies that the syntactic category of the head is verbal, and that no filler daughters can function as subject. The VP construction can thus be represented as follows.³⁰

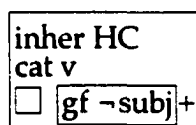


Figure 3. The Verb Phrase (VP) construction

²⁸ This notation should be distinguished from a Kleene star, which represents zero or more instances of the entity to which it is affixed.

²⁹ Although the VP construction sets no theoretical limit on the number of sisters to the lexical verb, any particular VP construct will have a finite number of such sisters.

³⁰ Note that the VP construction of Figure 3 does not account for single-verb phrases. These are licensed by the Subject-Predicate construction whose second daughter does not mention maximality. Note also that the order of the complement sisters in Figure 3 is determined by a separate construction. The direct object in English normally precedes any other arguments in the verb phrase, unless otherwise specified (e.g., in the case when it is postponed by the word-order construction which causes 'heavy' constituents to be realized later in a sentence). How the VP construction ensures that each VP ends up with an appropriate array of constituents to accompany its lexical verb is a matter of the valence of each individual predicator, as alluded to earlier.

In Figure 3, the notation 'inher HC' says that all of the properties mentioned in the HC are shared by the VP construction.

The other four constructions that inherit the HC may be accounted for in a similar way. In the case of the N' construction, however, N' is [max -] because, as is well known, recursion of the specifier + noun must be blocked.

2.8.2 The XH construction

The XH construction is a phrasal construction in which a lexical or non-lexical head daughter is preceded by exactly one maximal specifier or filler constituent. The XH construction may be represented as in Figure 4:



Figure 4. The XH construction

Note that the right head daughter is not specified with respect to lexuality so that a member of the HC family does not have to serve as the right daughter of the XH construction.

The XH construction is inherited by constructions that are more specific. They can be distinguished in terms of whether or not the left daughter is a filler. If the left daughter is not a filler, it is an NP construction with a non-possessive determiner. If the left daughter is a filler, the construction may be further subdivided, depending on whether the filler is a local or a non-local one. If the filler is local, the construction is either the Subject-Predicate construction, the NP

construction with a possessive determiner, or some other. If the filler is non-local, the construction is the Left Isolate construction.

2.8.2.1 The Subject-Predicate construction

As an illustration, let us consider the Subject-Predicate (SP) construction which inherits XH.

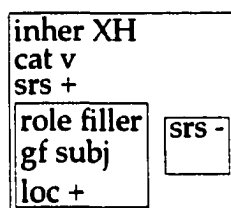


Figure 5. The Subject-Predicate (SP) construction

In Figure 5, note that the 'inher XH' notation does away with the need to encode 'role head' in the right head daughter. The feature 'cat v' indicates that it is a verbal structure, and is shared by the mother and the head daughter by the Head Principle. CG assumes that the VP is the head of the sentence. Since the head of the VP is a verb, the sentence is a projection of a verb and its immediate projection.³¹

The [srs +] feature indicates that it is a sentential structure, and not a V or VP. It is distinguished from the right head daughter, [srs -], since its head

³¹ There are syntactic and semantic reasons that CG takes the verb to be the head of a sentence. Syntactically, VPs and sentences share many distributional characteristics, comprising a natural class. Semantically, the frame the verb evokes is almost the same scene expressed by a clause, as alluded to earlier.

daughter is not saturated in terms of this feature. The subject requirement of the head daughter is satisfied by its left filler sister, whose realization has to be manifested ([role filler], [gf subj], [loc +]). Note that in the left daughter there is no specification of syntactic information like categories or maximality because not all subject constituents need to be noun phrases.

Note also that the head daughter is unspecified with respect to lexicality. This omission is made to accommodate the fact that an intransitive verb licensed by a lexical construction directly unifies with a SP construction, avoiding an unnecessarily complicated intermediate VP structure.³²

³² For instance, a verb like *say* may constitute an entire verb phrase, as in *I remember what Jane said*.

Chapter 3 Previous approaches to the *Tough* and related constructions in generative grammar

This chapter outlines various treatments of the English *Tough* and related constructions in the history of generative grammar.

As introduced earlier, the *Tough* construction (TC), illustrated in (1), is a structure in which one of a small class of adjectives, known as *tough* predicates, like *tough*, *easy*, and so on has a subject which is understood as the so-called missing argument of an infinitival phrase.

- (1) a John is easy to please.
b Mary would be difficult for anyone to talk to.

Since Lees (1960) first mentioned the TC as one of the constructions that feature an adjective plus a *to*-infinitival phrase in English, the *Tough* and its associated constructions have played a significant role in the development of generative syntax.

As with the treatment of other English constructions in the generative tradition, the study of the *Tough* and related constructions roughly falls into two approaches: transformational vs. non-transformational.

3.1 Transformational approaches

Lees notes that there is a syntactic and semantic relationship between sentences like (2a) and (2b).

- (2) a John is easy to please.
b To please John is easy.

In (2a), the matrix subject of the TC, the *tough* subject is notionally an object of the embedded verb 'please', as shown by the paraphrase in (2b). This fact is confirmed by a syntactic peculiarity in (3).

- (3) * John is easy to please Mary.

Sentence (3) is ungrammatical because the embedded transitive verb *please* has, in addition to *John*, another object *Mary*, which is realized in its expected position. In other words, the subject of the surface structure bears the semantic relation that it would have if it were in the gap in (2a) (i.e. the *tough* gap). These semantic relations are reflected in selectional restrictions, as in the following:

- (4) a ! Radios are easy to please.
b ! Those rocks are easy to teach.

The examples in (4) are semantically odd because they violate the selectional restriction of animacy that holds between the embedded verb and its object.

Chomsky (1964) proposes a transformational analysis of the semantic relations between (2a) and (2b). He contrasts the *easy* class of adjectives with the *eager* class of adjectives to illustrate the superiority of a transformational model over a phrase structure model.¹ He argues that transformational grammar can capture the fact that *John*, for example, is understood as the subject of the verb *please* in (5a), but as the object of *please* in (5b).

¹ However, this apparent advantage lost its theoretical appeal after the appearance of more advanced versions of phrase structure grammar, such as GPSG, in the 1980s.

- (5) a John is eager to please.
b John is easy to please.

He also argues that the same transformational model of grammar may capture similarities in meaning between the TC, and its related extraposition construction, as shown in (6).

- (6) It is easy to please John.

The ensuing analyses that have diverged from Chomky's ideas mostly concern the nature and analysis of the transformational rule involved. The main issue is the determination of whether the *tough* subject and the *tough* gap are in a direct or an indirect relationship with each other. Proponents of the former adopt the *tough* movement analysis, the *tough* deletion analysis, or control analyses in GB. Proponents of the latter adopt the WH-extraction analysis.

3.2 *Tough* movement vs. *tough* deletion

For the sake of convenience of presentation, we will first summarize the *tough* movement and *tough* deletion accounts and then provide arguments for each account.

3.2.1 The *tough* movement analysis: Rosenbaum 1967, Postal 1971, Chomsky 1973, and Berman 1974

The basic assumption of the *tough* movement analysis is that the *tough* subject derives from the object position of the embedded verb. Actual proposals

differ as to whether they posit an intermediate extraposition process in the derivation.

Rosenbaum (1967), who offers the first explicit formulation of a movement analysis, posits a movement rule that involves a derivation including extraposition and *it*-replacement. For sentences like (7a), for instance, Rosenbaum proposes the underlying structure shown in (7b). This underlying structure then undergoes extraposition, shown in (7c). When the pronominal subject *it* is replaced by an embedded object in the complement S, the surface form shown in (7d) is derived.

- | | | | |
|-----|---|--|---------------------------|
| (7) | a | John is easy to please. | (surface structure) |
| | b | [_S To please John] is easy. | (underlying structure) |
| | c | It is easy [_S to please John]. | (extraposition) |
| | d | John is easy [_S to please]. | (<i>it</i> -replacement) |

Postal (1971), on the other hand, does not posit an intermediate derivational stage involving extraposition. Postal's movement analysis applies directly to the structure with a sentential subject (7b). It replaces the sentential subject with an embedded object NP, moving the remaining portion of the embedded clause to the end of the VP in the matrix sentence. That is, (7d) derives directly from (7b) without the intervening (7c). However, neither Rosenbaum nor Postal presents any arguments for or against the necessity of the intermediate derivational stage.

The issue of the postulation of an intermediate stage of extraposition continues with Chomsky 1973 and Berman 1974 in a slightly complicated manner. Berman (1974) argues against an independent stage of extraposition on two grounds. First, if derivation of the TC involves the two separate stages of

extraposition and movement, one might imagine a situation in which some transformational rule would occur between these two independent rules. However, there are no such cases. This implies that there is no need to separate the two processes.

Second, if extraposition is a rule that moves a *to*-infinitival phrase to the end of a matrix sentence and makes it a daughter of the matrix sentence (following Lakoff 1968), then the string *tough* + infinitive cannot be a constituent. This runs counter to other indications that the *tough* + infinitive string is indeed a constituent, as suggested in example (8).

(8) Easy to please though Mary is, John does not like her.

However, the extraposition test is not convincing since we can also assume that extraposition is a rule to the effect that movement of a *to*-infinitival phrase makes the phrase a sister to the *tough* adjective *easy*. This assumption is in accord with the indications that the *tough* + infinitive string is a constituent.

Chomsky 1973, on the other hand, follows the spirit of the previous two-stage movement analysis of Rosenbaum 1967. Unlike Rosenbaum, however, Chomsky posits PRO in the underlying structure as the implicit subject of the embedded infinitive and decomposes the single extraposition into extraposition and *it*-insertion.

According to Chomsky's analysis, then, the derivation of the TC involves extraposition, *it*-insertion, and *it*-replacement. For example, he proposes the following derivation for sentences such as (9a).

(9) a John is easy to please. (surface structure)

- | | | |
|---|---|---------------------------|
| b | [_S PRO to please John] is easy. | (underlying structure) |
| c | is easy [PRO to please John]. | (extraposition) |
| d | It is easy [PRO to please John]. | (<i>it</i> -insertion) |
| e | John is easy [PRO to please]. | (<i>it</i> -replacement) |

Chomsky, however, immediately notes that *it*-replacement violates the specified subject condition (SSC), which is one of the constraints that he proposes in order to restrict the applicability of NP movement rules. The SSC posits, incorrectly, that (9e) is ill-formed because movement of the embedded object *John* in (9d) to the matrix subject position crosses an uncontrolled embedded PRO subject.

In order to account for this type of counterexample without losing the general effects of the SSC, Chomsky proposes an ad hoc rule of PRO replacement. This rule has the effect that an object moves to each intermediate node, replacing PRO, until it reaches the highest node, where it can then replace the pronominal *it*. In other words, this rule that comes between *it*-insertion and *it*-replacement skirts the problems created by the postulation of the null category, PRO. The modified derivation for (9a) is shown in (10):

- | | | | |
|------|---|---|---------------------------|
| (10) | a | John is easy to please. | (surface structure) |
| | b | [_S PRO to please John] is easy. | (underlying structure) |
| | c | is easy [PRO to please John]. | (extraposition) |
| | d | It is easy [PRO to please John]. | (<i>it</i> -insertion) |
| | e | It is easy [John to please]. | (PRO replacement) |
| | f | John is easy [PRO to please]. | (<i>it</i> -replacement) |

Bach and Horn (1976), however, note that the constraints Chomsky (1973) proposes to reduce the power of transformations sometimes fail to license some well-formed sentences. For example, sentences such as (11) would be ruled out under Chomsky's revision.

(11) John is hard for me to imagine anyone looking at.

Here, even though the movement of *John* from the embedded object position crosses the embedded specified subject *anyone*, (11) is grammatical. This inconsistency apparently stems from the assumption that the embedded infinitival phrase of *tough* predicates (i.e. the *tough* infinitive) is an S that has an implicit PRO subject.

To prevent this problem, two different configurational analyses of the *tough* infinitive are argued for: S' or VP. Chomsky (1977) argues that the *tough* infinitive is S'. Under the S' analysis, the comp position provides an alternative position for the embedded object of the *tough* predicate to move into. *Tough* movement is no longer argument-to-argument movement (i.e., NP-movement), but rather argument-to-comp movement (i.e., WH-movement). Since the comp position provides an escape hatch, the *tough* infinitive is no longer subject to the SSC. On the other hand, Lasnik and Fiengo (1974) argue that the infinitive is a VP. Under the VP analysis, an implicit *tough* subject is not postulated, and the *tough* infinitive is not subject to the SSC.

3.2.2 The *tough* deletion analysis: Ross 1967, Lasnik & Fiengo 1974

The basic claim of the deletion analysis presented by Ross and Lasnik and Fiengo is that both the *tough* subject and the embedded object are base-generated in the underlying structure. The coreferential embedded object is then deleted under identity with its matrix *tough* subject.

Lasnik and Fiengo, however, differ slightly from Ross in their characterization of the category of the *tough* infinitive. While Ross takes it to be a sentential complement, Lasnik and Fiengo take it to be a VP complement based on observations made by Bresnan (1971).² Lasnik and Fiengo, therefore, suggest (12b) as the underlying structure of (12a).

- (12) a John is easy to please.
 b John is easy [_{VP} to please John]. (underlying structure)

In (12b), the second instance of *John*, the object of the verb *please*, is deleted under identity with the matrix subject *John* by the rule of deletion. Note that the deletion analysis also conforms to the SSC.

3.2.3 Arguments for the *tough* movement analysis

There are three main arguments for the movement analysis. First, Chomsky (1970) presents derived nominals as evidence for such an analysis. Consider the examples in (13).

- (13) a John's eagerness to please.
 b *John's easiness to please.

(13) shows that the *easy* and the *eager* class of adjectives differ in their ability to form derived nominals. The *eager* class permits their formation; the *easy* class does not.

² The details of the arguments for VP vs. S will be taken up in section 4.4.

Assume a framework in which derivational morphology does not change a subcategorization and occurs in the lexicon prior to the transformational component. In the lexicon, *eager* subcategorizes for an infinitival complement, as in *John is eager to please*. The same holds for the derived nominal *eagerness*, which appears in (13a).

On the other hand, *easy* requires a proposition as its subject, as in *to please John is easy*. Thus *easy* cannot appear in nominal form with an infinitival complement, and we cannot derive forms such as (13b). The difference in grammaticality between (13a) and (13b) is accounted for by the claim that *eager to please*, but not *easy to please*, is a possible string in the underlying structure. A movement analysis explains why we can get derived nominals from *eager* class predicates but not from *easy* class predicates.

Lasnik and Fiengo (1974), however, argue that nominalization does not have any bearing on the movement vs. deletion analysis. If all that is at stake is, as Chomsky claimed, that derived nominals retain their original subcategorization, then there is no reason that examples such as those in (14) should be ruled out.

- (14) a * The ease/easiness (of) to please John.
 b * The impossibility (of) to finish the paper.

Example (14a), together with (13b), shows that *easy* predicates do not have any plausibly related derived nominals.

Moreover, there exist no derived nominals for predicates such as *pretty* or *fragrant* which apparently require an NP argument as subject. Consider (15).

- (15) a Mary is pretty to look at.
 b * Mary's prettiness to look at.
 c * To look at Mary is pretty.
 d * It is pretty to look at Mary.
 e That flower is fragrant to smell.
 f * That flower's fragrance to smell.
 g * To smell that flower is fragrant.
 h * It is fragrant to smell that flower.

Given the unacceptability of (15c) and (15d), (15a) is the only possible underlying structure. In other words, *pretty* requires an NP subject, but cannot have a derived nominal, as shown by (15b). The same is true of the string *fragrant to smell* in (15e). What (13)-(15) really show is that whether or not an adjectival predicate allows derived nominals does not depend on whether or not it selects for a lexical NP subject in the underlying structure.

The second argument for the movement analysis comes from Postal and Ross (1971). It concerns reflexivization of the matrix subject. Consider Postal and Ross' original example.

- (16) Getting herself arrested on purpose is hard for me to imagine Betsy being willing to consider.

In order to account for the reflexive *herself* in the gerundial subject position (= *getting herself arrested on purpose*), Postal and Ross assume that *Betsy* occurs as the gerundial subject in the underlying structure. They postulate the underlying structure shown in (17) for (16).

- (17) [[_{S1} I imagine [_{S2} Betsy is willing to [_{S3} Betsy consider [_{S4} Betsy getting herself arrested on purpose]]]] is hard for me].

A cyclic application of Equi-NP Deletion in conjunction with *tough* movement derives (16) from (17). That is, the occurrence of *Betsy* in the most deeply embedded clause, S4, is deleted under identity with *Betsy* in the second most embedded clause, S3, which is similarly deleted in the next higher clause, S2. At the last stage of the derivation, in which the *tough* movement rule applies, (16) is derived. Under a *tough* deletion analysis, however, an otherwise unmotivated new kind of deletion would have to be added to the grammar to account for the absence of the embedded subject of the gerundial matrix subject NP. This is because the gerundial phrase is in the highest position, a position not subject to the normal Equi rule.

Lasnik and Fiengo (1974) challenge the validity of this argument. They dismiss the reflexivization argument as unconvincing because of its claim that subject deletion is independently motivated in other types of constructions. The example they cite from Akmajian 1972 follows:

- (18) Getting herself arrested on purpose is too crazy for me to imagine Betsy being willing to consider (it).

The degree construction of (18) may be derived only by deletion, since there is no possible movement source for (18). For this type of sentence, then, a new kind of deletion rule that deletes a subject that is coreferential with an embedded object is independently needed. Moreover, this new kind of deletion rule would not complicate the grammar if the existing Equi rule were reformulated such that the presence of a controllee could trigger the deletion of its controller.

In addition to the potential problem that different lexical items like *easy* and *too* may trigger different rule orderings with respect to Equi, Lasnik and Fiengo's arguments are not convincing, since the TC differs considerably from the degree construction. For example, the TC does not allow an optional embedded pronominal object, as in (19a), whereas the degree construction does, as shown by (19b).

- (19) a * Getting herself arrested on purpose is hard for me to imagine Betsy being willing to consider it.
 b Getting herself arrested on purpose is too crazy for me to imagine Betsy being willing to consider it.

The third argument for a movement analysis concerns VP idioms.

Consider (20), an example from Berman 1973.

- (20) a Headway is easy to make in their research.
 b Allowances are easy to make when you are not poor.
 c The hatchet is hard to bury after long hours of brawling.
 d A good impression is hard to make.

Berman observes that nouns like *headway*, *allowances*, etc. may occur only as an object of the verb in a VP, e.g., *make headway*, *make allowances*, etc., and cannot stand on their own. Under the movement analysis, sentences such as those in (20) can be accounted for since the matrix subject, which is part of the idiom, may derive from the embedded object of the VP. Under the deletion account, however, sentences like (20) cannot be accounted for in a simple way since a matrix subject that is only part of a VP idiom must be postulated in the subject position.

Lasnik and Fiengo (1974), however, argue that the VP idioms in (20) should not be taken as representative, since there are other VP idioms which do not allow their objects to appear as *tough* subjects. These cases would have to be regarded as exceptions to the *tough* movement analysis. For instance, in (21a), the NP *tabs* is part of the VP idiom *keep tabs on* but may not occur outside its usual object position in the VP.³

- (21) a * Tabs were easy to keep on Mary.
 b * Advantage was easy to take of Bill.
 c * The baby would be easy to throw out with the bath water.
 d * Careful attention is difficult to pay to boring lectures.

Examples like (20)-(21) show that, unless we assume a plausible semantic account for the different behavior of VP idioms, it is difficult to account for why they show differences in 'movement' behavior.

3.2.4 Arguments for the *tough* deletion analysis

There are three arguments that have been presented in support of the deletion analysis. First, Ross (1967) and Lasnik and Fiengo (1974) observe that *tough* and other predicates, including *too/enough* adjectives and *pretty*, share some features: they allow indefinite embeddability, show the non-finiteness condition that may require non-finite embeddings, and may be subject to a variety of other constraints. The constructions licensed by such predicates as *pretty* and *too/enough* adjectives require treatment along the lines of the deletion analysis since they apparently lack any movement sources. Given the syntactic

³ Examples (21a) and (21c) sound fine to some speakers.

parallelism between *tough* predicates and these other predicates, the TC also might be analyzed as involving object deletion of a general type. The analysis of the TC in terms of an object deletion rule does not complicate the grammar since it is needed independently.

Second, based on an argument originally made by Klima (1964), Ross (1967) argues that there is a meaning difference between the TC and the arguably related extraposition construction. Consider (22) - (23).

- (22) a It is easy to play sonatas on this violin.
 b This violin is easy to play sonatas on.
 c Sonatas are easy to play on this violin.
- (23) a John made it easy to please Mary.
 b John made Mary easy to please.

Given a meaning difference, which Ross unfortunately does not show,⁴ examples such as (22)-(23) pose a problem for the movement analysis because transformational rules cannot change meaning within the transformational model that was constructed at that time.

Berman (1974), however, argues that the 'putative' meaning difference, if it exists at all, may not be due to the *tough* predicates, but to other factors. She notes that the semantic difference observed in (23) disappears in the pair of sentences given in (24).

- (24) a John made it easy to follow the lecture by providing a very complete hand-out.
 b John made the lecture easy to follow by providing a very complete hand-out.

⁴For the semantic difference between the TC and the extraposition construction, see section 4.2.

The difference between (23b) and (24b) is that the affected object is animate in (23b), but inanimate in (24b). Given the fact that only when an animate object is embedded under a causative verb such as *make* does it make a truth conditional difference, what thus explains the semantic difference in (23) - (24) is the animacy of the *tough* subject. Thus, the apparent semantic difference in (22) - (23) might not be due to a constructional difference (i.e., to a difference between the *Tough* and extraposition constructions).

Third, Ross (1967) and Lasnik and Fiengo (1974) show that certain instances of *tough* sentences cannot be accounted for in terms of the movement analysis since there is no possible input for the derivation. One type of sentence that Lasnik and Fiengo use in their argument is the case in which the *tough* adjective is embedded under the verb *try*. Consider (25).

(25) John tries to be easy to please.

Under the movement analysis, an account of the grammaticality of (25) might not be easy since there no possible input to the output. Possible forms of source sentences such as (26a) and (26b) are ill formed.

(26) a * John tries (for) it to be easy to please.
 b * John tries (for) to please John to be easy.
 c John tries to be easy to please John.

Under the deletion analysis, however, (25) does not pose any problem since the input sentence for (25) could be (26c) in which the embedded object *John* is deleted under identity with the matrix subject *John*.

Berman (1974) and Jackendoff (1975), however, contend that this argument is not convincing since the constraint that Lasnik and Fiengo observe holds for other constructions. Consider, for example, (27).

- (27) a John tried to be selected by the committee.
 b * John tried for the committee to select him.

In an old model of transformational grammar, under the widely held assumption that a passive is derived from an active by transformation, there is no other way for (27a) to be derived than from (27b).

Moreover, as Berman notes, the intentional verb *try*, when used in conjunction with *tough* predicates, shows some grammatical peculiarities which otherwise do not reveal themselves with other predicates. Consider (28).⁵

- (28) a * John tried to be easy to convince Mary to invite to her party.
 b * John tries to be easy for Mary to please.
 c * John tries to be hard to give advice to these days.

For some unknown reason, when *tough* predicates are preceded by the verb *try*, they do not allow multiple embedding (28a), the *for*-NP phrase (28b), and extraction of the so-called indirect object (28c).

3.2.5 Summary

In order to account for syntactic and semantic relatedness between the *tough* subject and the *tough* gap, analyses of *tough* movement and *tough* deletion have been proposed.

⁵ Examples (28b) and (28c) sound fine to some speakers.

Arguments for movement focus on derived nominals, reflexivization, and VP idioms. However, derived nominals do not provide evidence for movement since *easy* predicates have no derived nominals at all. Reflexivization does not provide evidence for movement since the phenomenon does not pertain exclusively to the TC. The same constraint in the TC can be found in other constructions. VP idioms do not provide evidence for movement either since there is another type of VP idioms which resists any kind of movement analysis.

Arguments for deletion focus on the similarity of the TC with other deletion constructions, a meaning difference between the TC and the extraposition construction, and a type of *tough* sentence that does not have a possible input for *tough* movement. However, the similarity of the TC with other deletion constructions does not provide any evidence for deletion since the observation is superficial, and since there are significant differences between deletion constructions. The meaning difference does not provide evidence for deletion since it can be accounted for by other factors such as animacy, which can also affect grammaticality in other constructions. The existence of some types of *tough* sentences which do not have possible inputs for *tough* movement does not provide evidence for deletion either because there are some constructions, such as the passive, which also do not have proper input sources but are derived from the underlying structure via transformation.

Thus, as far as empirical evidence is concerned, no convincing arguments have been advanced for either the deletion or movement analyses.

3.3 The WH-extraction analysis

As we saw in section 3.2.1, the theory-internal consideration that the TC does not obey the constraint that regulates *tough* NP movement leads Chomsky (1977) to propose the WH-extraction analysis.

Chomsky's empirical argument for the WH-extraction analysis comes from the observation that the TC shows certain characteristics normally associated with WH-constructions, though it contains no overt WH-word. The common properties of the WH-constructions are as follows:⁶

- (29) Common properties of the WH-constructions
- a shows long distance dependencies.
 - b observes a variety of constraints on WH-movement.
 - c allows parasitic gaps.

In canonical WH-constructions such as constituent questions, topicalization, relativization, and so on, a WH-gap is created by the movement of a phonetically real WH-phrase. In the TC, on the other hand, the operator involved is not a real WH-phrase, and the gap can be created by either movement or by base-generation.

Unlike the case in the *tough* movement and deletion analyses, the relationship between the *tough* subject and the *tough* gap in the WH-extraction analysis is indirectly mediated by an Operator. That is, this analysis proposes a mechanism by which the two separate relationships are posited: one is the relationship between the subject and the WH-item, and the other is the relationship between the WH-item and the *tough* gap.

⁶ This issue deserves more attention and will be dealt with in section 4.1.

Starting from Chomsky's observations, most subsequent analyses, whether transformational or non-transformational, adopt some version of the WH-extraction analysis, but these versions differ.

In the following sections, we will go over WH-extraction analyses within the transformational approach, which can be characterized in terms of the nature of the *tough* gap and the way the gap is created.

3.3.1 WH-operator movement analyses

Chomsky (1977, 1981, 1986) and Browning (1987) share the assumption that the *tough* gap is created by movement. But these analyses differ from each other according to their characterizations of the gap: null WH, PRO, variable, pro.

3.3.1.1 Chomsky 1977

Chomsky's analysis of the TC is as follows. The deep structure of (30a) is (30b).

- (30) a John is easy to please.
 b John is easy [_S' for [_S PRO to please WH-]. (Deep Structure)
 c John is easy [_S' WH-_i for [_S PRO to please t_i]. (Surface Structure)

In (30b), an NP *John* is base-generated in the matrix subject position, and a null WH-item is base-generated in the object position of the complement.

Application of WH-movement to (30b) moves a null WH-phrase to the COMP position of the embedded clause, and leaves a trace in its original position, as shown by (30c). In (30c), the relationship which holds between the moved WH-phrase and its trace is one of bound anaphora. Since an embedded WH-clause has a variable and is an open sentence, it must be given some value to be interpreted. When the WH-clause denotes a matrix subject property in terms of predication, it will be licensed. Then, the moved WH-item, the complementizer *for*, and PRO are deleted by the rule of free deletion in COMP and an output filter.

Note that since the *tough* subject is not an argument of the embedded verb, the thematic relation between the *tough* subject and the embedded verb is mediated by the WH-word in terms of predication. The evidence for a null WH-word comes from *tough* adnominal constructions in which *tough* adjectives modify nouns.⁷

Chomsky 1977 is a compromise between *tough* movement and *tough* deletion. It is similar to a deletion analysis in that the *tough* subject is base-generated. It is also similar to a movement analysis in that the *tough* gap is created by movement.

However, there seems to be some lack of clarity with the formulation of the WH-movement itself. For instance, it is unclear why a null WH cannot move all the way to the COMP of the matrix clause via a successive cyclic application of COMP-to-COMP movement (e.g., * *Who is John easy to please?*), as independently noted in Iwakura 1980.

⁷ See section 4.4 for details.

Moreover, it is not clear how this analysis can deal with cases in which the *tough* infinitive ends with a prepositional verb. (e.g. *John is easy to talk to.*) When an underlying WH-item pied pipes with its governing preposition from the underlying structure (e.g., *John is easy to talk to whom.*), WH-movement over-generates (e.g., **John is easy to whom to talk.*) (Iwakura 1980).

Another problem with Chomsky's analysis concerns so-called crossed vs. nested gap dependencies. While accounting for the ungrammaticality of (31), Chomsky incorrectly rules out sentences such as (32) (cf. Levine 1984a, b).

- (31) a * What sonata is the violin easy to play on? (Chomsky 1977)
 b * Who was this wine hard to persuade to buy? (Levine 1984b)
- (32) a What violin is the sonata easy to play on? (Chomsky 1977)
 b Which wine was John hard to persuade to buy? (Levine 1984b)

In (32a), when the WH-word, *what violin*, moves from its original position of the object of the preposition *on* to the matrix COMP position, it crosses the matrix subject *sonata*, hence violating the SSC. However, (32a) is well formed. The same applies to (32b). In (32b), the movement of *which wine* from its original position to the matrix COMP position additionally violates the Subjacency Condition since there is one more embedded infinitival clause in (32b). Since Chomsky does not make a distinction between these two types of gap sites, his analysis incorrectly rules out well-formed sentences such as (32) (cf. Levine 1984a, b).

To overcome the violations of Subjacency and the SSC, Chomsky proposes reanalysis.

3.3.1.2 Chomsky 1981

As we saw above, problems with the 'ghost' WH-movement analysis led Chomsky to propose a different approach. The major change in his assumptions is that the *tough* matrix subject position is empty. That is, the *tough* predicate has only an internal theta role to assign, and the matrix subject is not licensed by a theta role assignment. Some minor changes have also been put forth. First, the moved item is not an empty WH-word but a null PRO. Second, the complement clause does not contain the complementizer *for*. These two changes obviate the need for a rule effecting deletion in COMP. Third, the rule of predication is abandoned. The relationship between the moved PRO and the *tough* subject is instead captured by reanalysis.

The underlying structure of (30a) is shown in (33a).

- (33) a [NP e] is [AP easy [s' COMP [s PRO_i to please PRO_i]]. (D-Structure)
 b [NP e] is [AP easy [s' PRO_i [s PRO_j to please t_i]]. (PRO-movement)
 c [NP e] is [AP [A easy to please] t_i]. (Reanalysis)
 d John_i is [A easy to please] t_i. (S-Structure)

In (33a), the matrix subject position is empty, and the embedded object position is occupied by a case-marked null PRO. This PRO_i moves, since it must not be governed by the embedded verb *please* according to the PRO theorem. PRO_i moves to COMP of the infinitival phrase since the matrix subject position is governed by the matrix verb and is thus unavailable. PRO movement yields the structure in (33b). In (33b), PRO_i binds its trace. Thus we see how the intuition that the *tough* subject is semantically related to the *tough* gap is captured by

reanalysis. In (33c), the *tough* predicate and its following *to*-infinitival phrase are reanalyzed as a lexical adjective. PRO_i and PRO_j are deleted under the assumption that a lexical item may not contain null elements. Even though (33c) is grammatical in its structure, it cannot be properly interpreted because its trace is unbound. When the NP, say *John*, is inserted into the matrix subject position and has the same index as the trace in terms of random coindexation, the trace is bound by the matrix subject and is interpretable.

Reanalysis provides an account for the sentences in (32), which constitute counterexamples to Chomsky 1977. Since reanalysis erases a bounding node S and a specified subject PRO, sentences like (32) no longer violate the Subjacency or the SSC. Sentences with crossed gaps are still ruled out because movement out of a lexical item is not possible. The function of reanalysis is to invoke NP-movement while circumventing the problems which accompany it.

Chomsky's arguments for reanalysis are based on an insight from Nanni 1980, originally attributed to Berman 1974. Nanni proposes a complex adjective formation rule for the *tough* adjective and its following infinitive, arguing that they behave as a single constituent.⁸

However, Chomsky is not explicit about the process and the formulation of reanalysis. Since he does not provide any general criterion to use to identify which strings will undergo reanalysis, the rules of the reanalysis may overgenerate, producing a complex adjective phrase out of any string, (e.g. *a difficult-to-persuade-Mary-to-tell-her-friends-to-date man*).

⁸ See section 4.5 for further details.

Furthermore, lexical insertion at SS is problematic. It is incompatible with the Projection Principle, which says that a position must be theta-marked if it is occupied by a lexical item. It also duplicates the function already assumed by DS.⁹

Another significant problem with the analysis of Chomsky 1981 is what is called a *tough* paradox (cg. Wilder 1991). The reanalysis wrongly predicts that the operation of WH-movement determines selection of a subject argument. A *tough* adjective selects an argument subject only when the *tough* infinitive has undergone internal WH-movement. This is against the standard assumption that argument selection or theta-marking is done in the lexicon before the application of syntactic rules. WH-movement in the *tough* infinitive is dependent on the presence of a referential NP, not vice versa.

3.3.1.3 Chomsky 1986

Chomsky abandons his 1981 reanalysis analysis and returns to his 1977 position, which postulates a base-generated matrix subject. There, he makes one theoretical refinement about the operator. Instead of a null WH-element, he simply proposes an empty operator (OP), not identifying its characteristics.¹⁰

Chomsky's (1986) analysis of (30a) is given in (34).

⁹ The recognition of this kind of problem motivated Chomsky (1994) to eliminate DS in his new program of 'minimalism'.

¹⁰ As Lasnik and Uriagereka (1988) point out, OP cannot leave a WH-trace, since then the empty operator binds a WH-trace, which violates Condition C of Binding Theory.

- (34) a John is easy [_{S'} [_S PRO to please OP]]. (D-Structure)
 b John is easy [_{S'} OP_i [_S PRO to please t_i]]. (S-Structure)

The movement of the null operator from the object position of an embedded clause to the specifier of the CP position would yield an S-Structure such as (34b). The empty category, *t*, created by null operator movement, is a variable in the sense that it is locally A'-bound by a null operator. However, since the null operator is not able to assign a range to the variable it binds, the category *t* is a free variable, a category type prohibited at LF. In order for the empty category to be fully interpreted at LF, the variable must have its range fixed by a restricted quantifier or by an antecedent. The open sentence is interpreted when it is bound by the subject *John* in terms of predication, as in Chomsky 1977. When full interpretation at LF applies, the matrix subject and the gap are coindexed.

Chomsky's analysis is based on a GB-internal motivation. In GB, the *tough* subject 'John' cannot directly derive from the embedded object position. Otherwise the chain (John, *t*) would receive two cases: nominative from the matrix INFL and accusative from the embedded verb. Such a state of affairs would violate Case Theory.

3.3.1.4 Browning 1987

Relative to Chomsky 1981, Browning shares the assumption that the *tough* subject does not have a theta role, but differs in its characterization of the null operator. It is *pro* rather than PRO.

Browning argues that identification of the null operator as *pro* is advantageous on three grounds. First, since the null operator at issue, when moved, may be preceded by a lexical complementizer such as *for*, it cannot be PRO. This is because PRO must not be governed as per the PRO theorem. Second, *pro* shows more characteristics of overt WH-items such as *what* and *who*, which are traditionally treated as pronouns rather than as reflexive anaphors. Third, *pro* is independently needed in pro-drop languages; thus, introduction of *pro* to the TC does not complicate the theory of grammar.

Browning assumes that the matrix subject position is non-thematic, and that the *tough* infinitive is not a complement, but an adjunct. This implies that the matrix subject is licensed not by the external argument of the adjective, but by the null operator chain in the infinitive.

Browning posits the underlying structure (35a) for a sentence such as (30a):

- (35) a [NP₂ e] is [AP₂ [NP₁ John] [A' [A easy] [CP [IP₁ to please pro]]]]].
 b [NP₂ e] is [AP₂ [NP₁ John] [A' [A easy] [CP [pro_i [IP₁ to please t_i]]]]].
 c [NP₂ e] is [AP₂ [NP₁ John] [A' pro_i [A easy] [CP [t_i [IP₁ to please t_i]]]]].
 d [IP₂ [NP₂ John_j] is [AP₂ [NP₁ t_j] [A' pro_i [A easy] [CP [t_i [IP₁ to please t_i]].

In (35a), a null operator, *pro*, is base-generated in the object position of the complement. In (35b), *pro* moves to the specifier of CP. Pro movement is motivated on the theoretical ground that *pro*, by its nature, must have its agreement features identified and should move to an A' position for

identification by a preceding noun.¹¹ Since *pro* is not identifiable in the specifier of CP, it moves to the specifier of AP1 position, as in (35c). *Pro*, in the specifier of AP1, coindexes its head, the adjective *easy*, via the spec-head agreement. The adjective is then coindexed by its maximal projection AP1 by feature percolation. AP1 is in subject-predicate relation with the subject NP1 *John* since the subject coindexes a chain (*pro*, *t*) in the predicate AP.¹² Hence, NP, AP, *pro*, A, and *t* are all coindexed. Since coindexation means sharing agreement features, the agreement features of *pro* are identified with those of its antecedent NP *John*. Since the specifier of AP2 is not a case-assigned position, however, *John* moves to the specifier of IP2, where it receives the nominative case from INFL.

However, one of the problems with Browning's analysis is that it is not clear how *John* in (35a) originates in the specifier of AP. It is not a theta-marked position, and the presence of *John* is not required by the Projection Principle.

3.3.2 WH-operator insertion analyses

Koster (1987), Epstein (1988), Cinque (1990), and Wilder (1911) share the idea that the WH-word is base-generated. However, they differ from each other in their characterization of the WH-word.

¹¹ *Pro* is identified either by agreement or by a local A'-antecedent.

¹² Browning's definition of predication is as follows:

- (i) A subject-predicate predication relation is licensed iff
 - a the subject discharges the external theta-role of the predicate or
 - b the subject agrees with a chain contained within the predicate.

3.3.2.1 Koster 1987

Within a monostratal version of GB, Koster argues that the relationship between the matrix subject and the variable in the infinitival phrase does not involve the direct establishment of an A-chain. He argues that there are two separate A-chains which are licensed by one and the same theta role: an operator-variable chain and a subject-operator chain. The connection of these two chains is established by theta role sharing. Koster postulates (36) for the representation of a sentence such as (30a):

(36) John is easy [_{CP} OP to please e].

The relationship between the *tough* subject and the *tough* gap in (36) is established by theta role-sharing, which is regulated by mechanisms of predication and theta role inheritance. A theta role is assigned to the gap position by its governor *please*. This theta role is then inherited, via theta role inheritance, by the operator position which binds it. The theta role is then transferred to the matrix subject through predication.

Koster argues that his approach gets around the problem of the *tough* paradox that faces Chomsky (1981). Within his one-level representational model, lexical insertion and the chain of the null operator and its trace occur at the same representational level, and the former does not depend on the latter.

However, theta role-sharing seems to violate the strict requirements of the Theta Criterion concerning theta roles and arguments. According to

Chomsky's (1981) Theta Criterion, each theta role is assigned to only one argument and each argument is assigned to only one theta role.

3.3.2.2 Epstein 1988

Epstein assumes that the matrix subject is thematically empty, and that the *to*-infinitival phrase is a complement to the *tough* predicate. He proposes an analysis very similar to traditional *tough* movement. His analysis builds on the 'improper' movement of May 1979, the affect- α of Lasnik & Saito 1984, and the revised Binding Condition C of Chomsky 1986.

For example, the derivation of (30a) can be schematically represented as follows:

- (37) a [NP e] is easy [CP [IP PRO to please John]]. (D-structure)
 b [NP e] is easy [CP John_i [IP PRO to please t_i]]. (S-structure)
 c John_i is easy [CP [IP PRO to please t_i]]. (S-Structure)
 d John_i is easy [CP OP_i [IP PRO to please t_i]]. (S-Structure)

Example (30a) has the D-structure of (37a). According to Epstein, the embedded object *John* in (37a) first 'improperly' moves, leaving a trace in its original position, to the COMP of the same clause. The reason for this is not clear though, since a referential NP in GB usually moves in order to receive Case. In (37b), *John* 'improperly' moves again from the COMP position to the matrix subject position, but this time leaves no trace in COMP since, in Epstein's words, "there is no principle to impose a trace in that position." This second movement results in the structure (37c). Now, however, (37c)'s structure

violates Binding Condition C of Chomsky 1981.¹³ The trace, t_i , a variable created by A'-movement, is bound by the NP *John*. Note that a variable is an R-expression in GB.

To resolve this apparent binding problem, Epstein has recourse to the affect- α of Lasnik & Saito 1984, and the new disjunctive binding condition of Chomsky 1986.¹⁴ In (37d), a null operator, OP, is inserted into COMP based on affect- α , part of which says "insert anything anywhere." As a result, (37d) gets around the binding problem. Since there is no binder available within the domain of the operator, IP, the variable is free.

The main argument for this analysis comes from the so-called connectivity effect shown by sentences like (38), first noted by Postal and Ross (1971).

(38) Pictures of herself are easy for Mary to shred.

The reflexive anaphor *herself* in (38) has no possible binder since it occupies the highest c-commanding position in the sentence. However, if we take (39) as the DS of (38), the reflexivization problem does not arise since the anaphor is c-commanded by PRO, which in turn is controlled by its antecedent *Mary*.

¹³ Chomsky's (1981) definition of Binding Condition C is as follows:

- (i) Binding condition C
An R-expression is free everywhere.

¹⁴ Chomsky's (1986) definition of Binding Condition C is as follows:

- (i) Binding condition C
a An R-expression is free in the domain of its operator, if there is an operator for the R-expression.
b An R-expression is otherwise free.

(39) $[_{NP} e]$ is easy for Mary_i $[_{CP} [_{IP} PRO_i$ to shred pictures of herself_i]].

However, a theory-internal problem of this approach is the fact that the direct movement analysis forms a chain headed by a case-marked NP in an A-position and tailed by another case-marked variable. This runs counter to the standard GB assumption that the matrix subject and the trace in the embedded infinitive must be in separate chains, since a chain may not contain two case positions.

3.3.2.3 Cinque 1990

Cinque's analysis of the TC is as follows. The DS and the SS of (30a) are shown in (40a) and (40b):

(40) a John is easy $[_{CP} OP$ for $[_{IP} PRO$ to please pro]. (D-structure)
 b John_i is easy $[_{CP} OP_i$ $[_{IP} PRO$ to please pro_i]. (S-structure)

In (40a), the matrix subject is base-generated at DS. The *tough* gap position is occupied by pro, a null resumptive pronoun. An operator [-a, +p] is base-generated in the specifier of the CP position. Free-indexing at SS derives (40b) from (40a).¹⁵ Due to free-indexing, the null resumptive pronoun at SS is bound by an operator, which in turn is bound by the matrix subject, and hence becomes a variable. Pro, free in its governing IP domain, can have agreement

¹⁵ Note that there are two kinds of indexing assumed in Chomsky 1981: one created by movement at SS, and the other by free-indexing at DS. In the case of free indexing, the right indexing is licensed by index checking. Chomsky (1982) argues that a WH-operator base-generated in an A' position is not indexed at SS. However, Cinque justifies free indexing at SS. See Cinque 1990 for details.

features. Since *pro* is bound by *OP* in the specifier of *CP*, the agreement features of *pro* in (40b) are identified by *OP*, too.

Cinque's argument for identification of the gap as a resumptive pronoun is rooted in his observation that extraction of a direct object in ditransitive sentences is more natural when the indirect object is a pronoun.

In a ditransitive construction, the direct object cannot be a pronoun, as in (41a).

- (41) a * I gave that man it/ them.
 b *? Books are not easy to give that man.

Cinque argues that a similar constraint is operative in the TC in (41b). He argues that (41b) is ungrammatical because a pronominal element stays covert in the direct object position in (41b). This is confirmed since grammaticality improves when the indirect object is also a pronoun.

- (42) a Gimme it.
 b I gave 'im THEM.

The same improvement is seen in the TC.

- (43) Books are not easy to give him.

If we agree with the judgments in (42), we can hardly disagree that the same constraint is operative in (43).

Cinque's rejection of a movement analysis as the origin of the null resumptive pronoun comes from his observation that constructions of object deletion are not uniformly sensitive to bounding.¹⁶

Cinque argues that this characterization of the gap in the TC can account for its similarities with and its differences from WH-constructions. The similarities between WH-constructions and the TC are captured by the fact that they are all A'-bound empty categories. The difference between the syntactic behavior of the TC and that of the WH-constructions derives from the fact that the *tough* gap is a covert resumptive pronoun, base-generated at DS, whereas the WH-gap is a pure variable created by movement at SS.

3.3.2.4 Wilder 1991

In order to avoid Chomsky's *tough* paradox, Wilder challenges the standard assumption that the null operator infinitive is a complement of the *tough* adjective. He then presents arguments for treating it as a member of the class of adjuncts that includes infinitival relatives and purpose clauses.¹⁷

Wilder assumes that *easy* takes two arguments: an obligatory external theme role and an optional experiencer. The obligatory external theta role, theme, is syntactically realized either as NP or as CP. When the *tough* subject is realized as an NP, it is usually followed by the infinitival phrase whose specifier position is filled by an empty operator. The operator infinitive does

¹⁶ Moreover, a movement strategy is not considered plausible on theory-internal grounds. See Cinque 1990 for details.

¹⁷ See section 4.5 for details.

not bear a theta role since it is an adjunct. It serves to restrict the range of possible subjects left open by the adjective.

Wilder gives the following analysis of *tough* sentences such as (30a):

- (44) a John is easy [_{CP} OP [_{IP} to please e]]. (D-structure)
 b John_i is easy [_{CP} OP_i [_{IP} to please e_i]]. (S-structure)

In (44a), the matrix subject is base-generated, and an operator is inserted into the specifier of the CP position. When the operator is inserted, it is coindexed with the gap in the infinitive and with the matrix subject, as in (44b).

Given that the operator-infinitive is an adjunct, it is not clear how the semantic relationship between the *tough* subject and the *tough* gap is captured. Moreover, it is not clear why the TC without an infinitive is ungrammatical when the *tough* subject is a CP. See (45).

- (45) a * That this should be so is hard.
 b * Why John did this is hard.

3.3.3 Summary

In this section, we have looked at WH-extraction analyses within the transformational approach. They differ from each other with respect to the nature of the *tough* gap.

3.4 Control analyses in GB

Even though most of the treatments of the TC in GB since Chomsky 1977 are in the spirit of WH-extraction analyses, there are a couple of control analyses in GB. In this section, we will go over these analyses. They differ from the WH-extraction accounts in that the *tough* infinitival phrase is not a CP.

3.4.1 Direct movement analysis: Pesetsky 1987

Pesetsky 1987 is similar to Epstein 1988 in that the matrix subject originates in the gap position of the infinitive, but differs in that movement is direct and not via the COMP of the CP position of the infinitive.

He advances a direct movement analysis very similar to the *tough* movement analysis in early generative grammar. The DS and SS for sentences such as (30a) would be as shown in (46a) and (46b):

- (46) a [NP e] is easy [PRO to please John].
 b John_i is easy [PRO to please t_i].

The matrix subject is not an argument of the adjective but is derived directly from the object position of the infinitive. The trace and the *tough* subject are related by the single direct establishment of an A-chain.

The main argument for direct movement comes from the so-called connectivity effects illustrated in (47), as in Epstein 1988.

- (47) These pictures of himself will be difficult to tell Bill about.

The anaphor in (47) is not c-commanded by its antecedent. But the anaphor and its antecedent will be in a c-command relationship if we allow the phrase containing the anaphor to be reconstructed in the original gap position of the infinitival phrase.

However, this approach appears to violate Case theory since the direct movement analysis forms a chain headed by a case-marked NP in an A-position and tailed by another case-marked variable.

3.4.2 VP gap analysis: Jones 1991

In reaction to Chomsky's (1981) *tough* paradox, Jones takes a similar position to that of Wilder in that the subject NP is theta-marked, and the *tough* infinitive is not theta-ruled since it is an adjunct, much like an object purpose clause. Unlike Wilder, however, Jones contends that the syntactic category of the *tough* infinitive is assumed to be a VP, rather than a CP.

Jones analyzes sentences such as (30a) as follows:

(48) John is easy [_{VP} to please e].

The obligatory presence of the *tough* gap is accounted for in terms of Burzio's (1986) generalization, which says that when a verb does not assign a subject theta-role, the verb does not assign a case to its internal object. In (48), the embedded verb *please* does not assign a theta role to its subject since it lacks a subject. So the embedded verb cannot assign Case to its internal object. Since

an overt NP must have Case in order to avoid violating the Case Filter, the embedded object must be a covert gap.

3.4.3. Summary

In this section, we have looked at control analyses in GB, which differ from each other with respect to the creation of the *tough* gap – movement or base generation.

3.5 Non-transformational approaches

3.5.1 Schachter 1981

In a review of the arguments for *tough* movement vs. deletion, Schachter notes that both approaches face difficulties when they try to account for *tough* sentences that do not have a surface *tough* subject.

- (49) a Being easy to please has its advantages.
 b It pays to be easy to please.

One of the difficulties with sentences like (49) is that there is no subject NP that is responsible for the deletion or the raising of the missing object. Example (49) shows that the occurrence of the missing object in the TC does not depend on the presence of the *tough* subject.

In an effort to evade this kind of problem, Schachter proposes a non-transformational analysis within Daughter Dependency Grammar,

incorporating dependency relations between the head and its dependents, as well as dominance and precedence relations.

His proposal is that the TC is directly generated, rather than derived from movement or deletion. He suggests the following dependency structure rule for sentences like (30a):¹⁸

(50)	easy	to	please
	+ adj	+ inf marker	+ verb
	+ transitive		+ elliptical
	+ inf comp		
	+ ellip comp		

(50) says that an *easy* adjective takes a 'transitive' infinitive complement with a missing element.

Since the ellipsis is restricted to either a transitive verb or a preposition, gaps are allowed only with objects and not subjects. The representation in (50) correctly predicts the difference in grammaticality between (51a) and (51b).¹⁹

- (51) a Mary is hard for me to believe John kissed.
 b * Mary is hard for me to believe kissed John.

Since the *tough* infinitival complement is not a WH-clause, it is not an island, and allows multiple extraction, as shown by (32), repeated here as (52).

- (52) a What violin is the sonata easy to play on?
 b Which wine was John hard to persuade to buy?

¹⁸ A detailed account of the Daughter Dependency Grammar analysis is not intended here, and hence details are omitted when not relevant to the discussion.

¹⁹ Example (51a) sounds ungrammatical to some speakers. For these speakers, 'extraction' of a missing object cannot occur across a finite clause boundary.

However, Schachter does not discuss how the *tough* subject, when present, controls the *tough* gap so that the selectional restrictions between the *tough* subject and the embedded gap are captured. It is not clear how the long-distance relationship between the *tough* subject and *tough* gap is represented in Schachter's dependency rule, since it is more like a control than an extraction analysis.

Nevertheless, Schachter's basic insights – that the TC does not depend on the presence of the *tough* subject and that *tough* predicates are responsible for the syntactic and semantic properties that they induce – are incorporated into various non-transformational treatments.

3.5.2 Gazdar et al. 1985

Gazdar et al.'s analysis of the TC is based on Schachter's observation that *tough* adjectives license the *tough* gap. Unlike Schachter, however, Gazdar et al. embrace Chomsky's idea that the TC is a species of extraction and introduce a device for capturing an unbounded dependency relation.

Within GPSG, they propose the following immediate dominance (ID) rule for *tough* predicates:

(53) $A^1 \text{ -----} \rightarrow H[42], VP [INF]/NP[ACC]^{20}$

²⁰ Actually, Gazdar et al. marks [-NOM] in their representation, but as Hukari and Levine (1991) note, this representation is technically wrong, since NOM is not a feature, but a value in the Gazdar et al. 1985 feature system. I follow Hukari and Levine's suggestion.

(53) indicates that a lexical head adjective subcategorizes for an infinitival VP with a missing object NP.

Note that the embedded gap is identified with a SLASH feature in (53), the same feature used for long-distance gaps found in canonical WH-constructions such as topicalization, as in (54).

(54) S -----> X2, H/X2

One of the differences between (53) and (54) is that while a gap and a filler are introduced on the same node in (54), only a gap is introduced in (53). The filler that is to be identified with the gap in (53) will be licensed in the same manner by which the subject agrees with its predicate, as we will see below.

Note also that the VP in (53) is a kind of underspecified category that comprises either a sentence or verb phrase, and whose exact category depends on the value assigned to the underspecified feature SUBJ (i.e. VP [+ SUBJ] = S, VP [- SUBJ] = VP). This implies that when a *for*-phrase occurs, it is not the dative of a matrix clause, but the subject of a lower clause.²¹

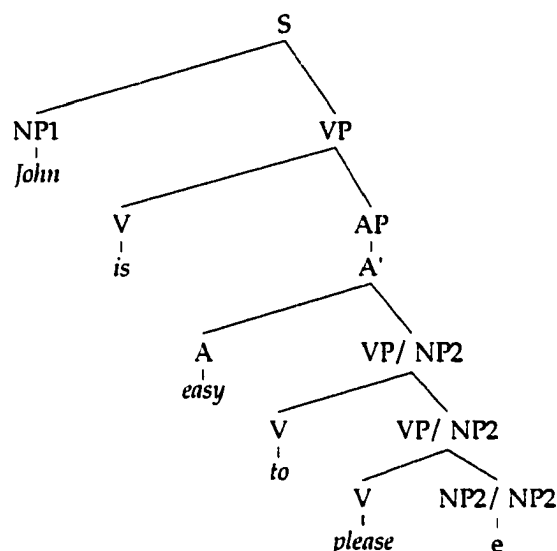
Let us see how the rule in (53) licenses sentences such as (55) within the mechanism of GPSG.

(55) John is easy to please.

The structure of (55) is shown in (56).

²¹ The arguments for a sentential analysis will be discussed in some detail in section 4.4.

(56)



Example (56) shows that the *tough* gap arises as the value of the gap feature SLASH propagates from the gap position via the extraction path to the *tough* subject position, where it receives its value. Even though Gazdar et al. do not show explicitly how the syntactic connection between the *tough* subject and the gap is achieved within their system, Hukari and Levine (1991) give a supplementary account of this.²²

In (56), the VP *is easy to please*, as a predicative category, bears the agreement feature of the subject NP1 [AGR NP1]. Since AGR is a foot feature, the feature matrix [AGR NP1] that appears on the node VP percolates down to AP in accordance with the Foot Feature Principle.²³ Since AGR is also a head

²² Technically, sentences like (55) cannot be licensed under Gazdar et al.'s system since they restrict the AGR feature to verbs only. The following account is based on Hukari and Levine 1991, which assumes that adjectives also have an agreement feature, AGR.

²³ The Foot Feature Principle says that a foot feature present on any non-head daughter node must be also present on the mother node and vice versa.

feature, the value [AGR NP1] percolates down to A' in accordance with the Head Feature Convention.²⁴

In the local tree whose mother node is A', the mother category carries [AGR NP1], but one of its daughters carries [SLASH NP2], which is licensed by the ID rule in (53). Note that both AGR and SLASH are control features, and that there is a conflict in control value. One is NP1, and the other is NP2.

The seeming conflict in the control feature and its values is resolved in terms of the Control Agreement Principle (CAP).²⁵ Since VP/NP2 does not have a controller in its local tree, the value of its control feature [SLASH, NP2] must match the value of the control feature of its mother [AGR, NP1]. No clash in control value arises, and the missing object is identified with the *tough* subject. The CAP guarantees the syntactic connection between the *tough* subject and the *tough* gap.

However, as Hukari and Levine note, what Gazdar et al. fail to note is that a case conflict problem arises within their system. Since A¹ carries [AGR NP[NOM]] in agreement with the subject NP, and the different case value [ACC] is introduced in the daughter node directly by the ID rule, the case features of the mother and daughter nodes do not match.

²⁴ The Head Feature Convention says that every head feature is shared between a head daughter and its mother node.

²⁵ The Control Agreement Principle says that (i) when there is a controller sister for a predicative category, the value of the predicate's control feature is a category equal to the head feature specifications of the controller, and (ii) when a predicate does not have a controller sister, the value of its control feature is that of its mother.

Note that the case problem does not arise in canonical WH-constructions in which the SLASH feature receives its value at the top node above the subject position. Hukari and Levine reason that the problem is due partly to the fact that there are differences between the canonical WH-gap and the *tough* gap.

In order to get around the problems with the differences between the *tough* gap and the WH-gap and to deal with the case conflict problem in particular, two different approaches have evolved: structural and lexical. The structural analysis maintains a syntactic connection between the *tough* subject and the *tough* gap, but uses a different feature for the *tough* gap. This analysis includes Hukari and Levine 1991. The lexical analysis, on the other hand, uses a similar feature that has the effect of SLASH, but feature information is encoded in the relevant parts of the lexical items. This analysis includes Chae 1992, Jacobson 1992, and Pollard & Sag 1994.

3.5.3 Hukari & Levine 1991

Hukari & Levine 1991 keeps the Gazdar et al. 1985 analysis of the syntactic dependence between the *tough* subject and the *tough* gap, and modifies the relevant rest of the Gazdar et al. 1985 system to account for the differences between *tough* gaps and WH-gaps.²⁶ Based on the distinction of two types of WH-construction made by Jacobson (1984), Hukari and Levine (1987, 1991) stipulate a new control feature for the *tough* gap. As a result, they revise the CAP, in addition to SLASH for a WH-gap.

²⁶ For the arguments for syntactic dependence made by Hukari and Levine, see section 4.1

The new control feature, GAP, represented as double slash //, takes a category as its value, as does the WH-gap SLASH feature. However, it is different from SLASH in that it does not bear a case feature. Since SLASH and GAP differ only in the presence or absence of a specification of a case feature, they capture the commonality between the WH-gap and the *tough* gap: they are null categories. The commonality is captured by the following Feature Occurrence Restriction (FCR):

(57) FCR: [+ NULL] > (SLASH ∨ GAP) & ~ (SLASH & GAP)

(57) says that null elements can be either SLASH or GAP but not both.

The ID rule for *tough* predicates in Gazdar et al. 1985 is now replaced by the following:

(58) $A^1 \text{ -----} \rightarrow H [42], VP[INF] // XP$

In (58), a lexical head, an adjective, subcategorizes for VP[INF] with a gap. Since the filler is not always an NP, XP is instead stipulated to cover not only an NP but also an S.

Since GAP is a new control feature different from SLASH, introduction of GAP requires modification of the CAP. The CAP is revised to accommodate the fact that certain features like case can be overridden in the new control feature GAP.

The relationship between the *tough* subject and the *tough* gap is now attributed to the features AGR and GAP, and the different values of AGR NP1 and GAP NP2 are regulated by the new CAP that says that when there is no

controller sister for a predicative category, the value of the predicate's control feature is the value, up to any specifications excluded by an FCR, of the control feature of the mother. The CAP is thus reserved for cases of mismatch.

Since case is restricted to NPs, Hukari and Levine stipulate the following FCR:

(59) FCR: [GAP: NP] > [GAP: NP[CASE: ACC]]

(59) says that when the value of a GAP feature is NP, its case must be accusative. Since the case specification for the NP in the value of GAP is restricted by an FCR, no case clash occurs.

Since there is a distinction between a *tough* gap and a WH-gap, one advantage of the introduction of the new GAP feature is that it makes it possible to predict that the TC can have multiple extractions. Since the *tough* gap and the WH-gap are specified as different features in Hukari and Levine's analysis, there is no practical difficulty in having more than one gap in the same node.

However, one problem with the GAP feature is that it is costly because it is not independently motivated.

3.5.4 Chae 1992

Chae proposes a lexical approach within the GPSG framework. He assumes that a *tough* adjective licenses the TC and triggers the existence of other parts of the TC.

He accepts the same two types of WH-constructions suggested by Hukari and Levine (1987, 1991). He uses the same GAP feature that Hukari and Levine introduce for *tough* gaps but proposes the following ID rule.

(60) AP -----> AP2, VP[INF]//NP [ACC]²⁷

In (60), the licenser is not a lexical head, but a phrasal head.²⁸ This implies that the *tough* infinitive is an adjunct, that is, a modifier to the AP.

In addition to the GAP feature, he introduces a new foot feature, GVPL,²⁹ for lexical items. The purpose of the new feature is to stipulate that the lexical information that *tough* adjectives carry does not go beyond a certain node, and can be cancelled out.

GVPL is a feature like GAP and SLASH, and takes as a value a complex category such as VP[INF]//NP[ACC]. This information is specified for *tough* adjectives in the lexicon.

The percolation of GVPL is governed by a feature-matching principle that says the GVPL feature, once introduced in the tree, percolates up to the node at which one of its daughters has the same GVPL feature value. Then the feature is cancelled out, and propagation stops.

²⁷ This is a simplified version. The optional PP is an argument of the *tough* adjective, and an argument of the embedded clause. In other words, the PP serves a double grammatical function: as dative of the higher clause and subject of the lower clause.

²⁸ Thus, (60) also covers types of sentences like (i):

(i) This paper is too hard to read

²⁹ GVPL stands for a Gapped VP licenser.

By means of the GVPL feature, *tough* adjectives check whether the independently motivated ID rules can be licensed by the syntactic requirements of *tough* adjectives. Chae's approach is thus a kind of licensing grammar.

Multiple extraction phenomena are treated in the same way as in Hukari & Levine 1991. In particular, Chae assumes that GVPL is a stack feature; that is, individual lexical items reside in the stack of lexical information. When the stack has more than one stack value, multiple extraction is possible. The fact that nested gaps but not crossed gaps are permitted in the TC is accounted for by the stipulation that a value that is higher in the stack 'pops out' before one which is lower in the stack.

Given that in the lexicon, *tough* adjectives select only their complements, and not their *tough* subject, the relationship between the *tough* subject and the gap is accounted for in terms of semantics. This is done by the lexical entailment theory of control by Jacobson (1992), which will be discussed in some detail below.

The case conflict problem does not arise since the *tough* subject and the gap do not bear any syntactic dependence on each other.

However, Chae does not address the issue of how the lexical category of *tough* can hook up with the AP position. Another problem with Chae's analysis is that it is uneconomical: the ID rule and the lexicon repeat the same lexical information.

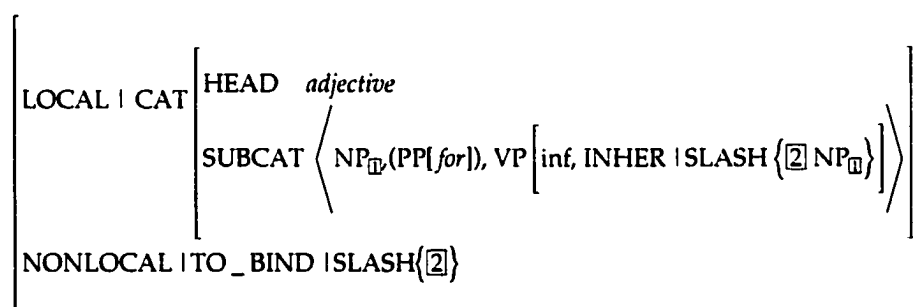
3.5.5 Pollard & Sag 1994

Following Jacobson 1984 and Hukari & Levine 1987 and 1991, Pollard and Sag accept two types of long-distance dependency construction: non-argument position filler constructions and argument position filler constructions. They argue that the TC belongs to the argument position filler constructions.

Unlike Hukari and Levine, however, Pollard and Sag claim that the relationship between the *tough* subject and the *tough* gap shows semantic matching rather than syntactic dependency. They argue that semantic matching is induced by the lexical properties of *tough* predicates. Their approach is thus lexically oriented.

The syntactic and semantic information that *tough* predicates have in the lexicon is given in (61):

(61) lexical sign for *easy*

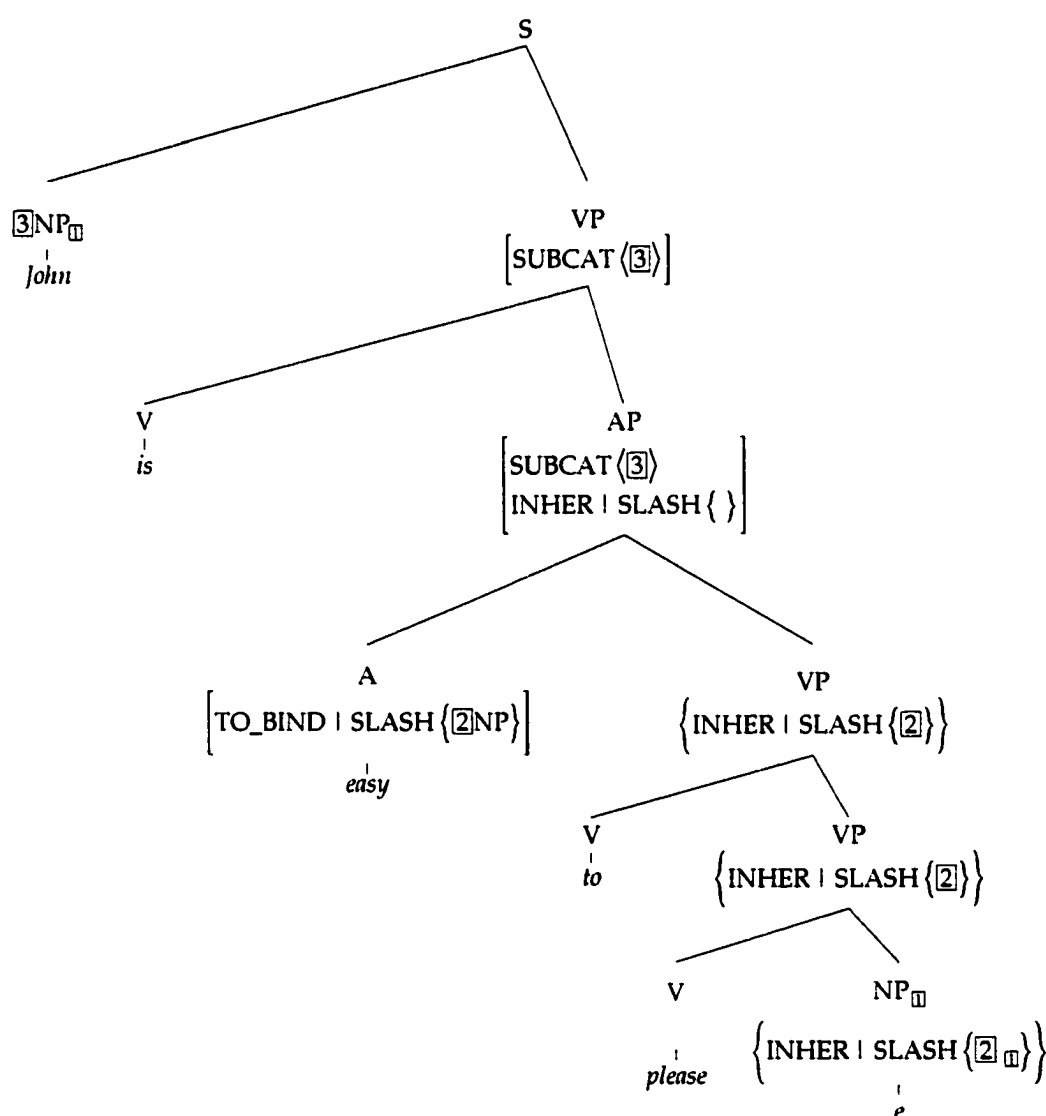


(61) says that *tough* adjectives subcategorize for a subject NP, an optional PP headed by *for*, and an infinitival VP complement with an NP gap. The semantic relationship between the *tough* subject and the *tough* gap is guaranteed by the

stipulation that they share the same referential index. By specifying accusative in the NP gap, the lexical sign prevents extraction of the subject from the *tough* infinitival complement. The stipulation of TO_BIND | SLASH serves to cancel the value of the INHER | SLASH feature, which will be discussed below.

Sentence (55) is now assigned the structure (62).

(62)



In (62), the SLASH value is cashed out by the *tough* predicate at the AP node. This is made possible by stipulating the TO-BIND feature at the A node. Because it is structure-shared with the *tough* adjective's TO-BIND | SLASH value, the INHER | SLASH member cannot propagate beyond the AP where it is cashed out.

Pollard and Sag's approach is therefore similar to those of Gazdar et al. (1985) and Hukari and Levine (1991) in that *tough* predicates subcategorize for an infinitival complement containing an accusative gap. However, the information is lexically specified and the *for*-NP phrase is analyzed as a PP rather than a comp + subject.

Pollard and Sag argue that their approach is superior to that of Gazdar et al. in several aspects. First, the case conflict problem does not arise in their system since *tough* predicates require no syntactic matching but only identity of reference between the matrix subject and the gap. Second, multiple extraction in the TC can be accounted for. In HPSG, the feature system provides set values for non-local SLASH features. It is possible to derive sentences with more than one gap in a single node. In GPSG, on the other hand, the feature system does not permit set values for a foot feature SLASH. It is impossible to specify a WH-gap and a *tough* gap on the same node. Third, a lexical approach would appear to be on the right track since languages vary with respect to the predicates that license gap-licensing complements.

There are, however, a couple of problems with Pollard and Sag's sign (61). As they admit, the sign does not specify which argument controls the unexpressed subject of the VP complement. Furthermore, it fails to encode the grammatical fact that the unexpressed subject of the VP complement should

refer to the *for*-phrase when it is present in a sentence. This fact is not easy to represent within Pollard and Sag's system where there is no distinction between subject and complements.

Another problem with the sign in (61) is that it licenses a gap in the finite clause as long as the finite clause is embedded under an infinitive. This is appropriate for Pollard and Sag since it is consistent with their grammatical judgments about sentences like (51a). But for those dialects which disallow sentences like (51a), the sign in (61) would have to be revised to accommodate the fact that *tough* predicates do not allow infinitival complements to take finite clauses. However, any implementation of this idea violates the Locality Principle.³⁰

Another problem is that since a sentential subject is possible as a subject in the TC, Pollard and Sag must take referential sentential arguments into account. This seems difficult because a sentential argument is not a referential expression in HPSG semantics.

3.5.6 Grover 1995

Within the framework of HPSG, Grover takes the TC to be a control construction rather than an extraction construction, as Pollard and Sag do. That is, the *tough* gap is not an extracted argument, but a controlled argument in the same way that the understood subject of control constructions is controlled by its antecedent.

³⁰ The Locality Principle says that heads cannot impose conditions on the internal constituent structures of their complements.

Within Grover's control analysis, the long-distance relationship between the *tough* subject and the *tough* gap is not mediated by a SLASH feature, but is interpreted by a series of control relations holding between local trees.

In order to guarantee the transfer of gap information between the local trees, she proposes the following missing object lexical rule that makes a sign for VPs that lack objects:

(63) Missing object lexical rule

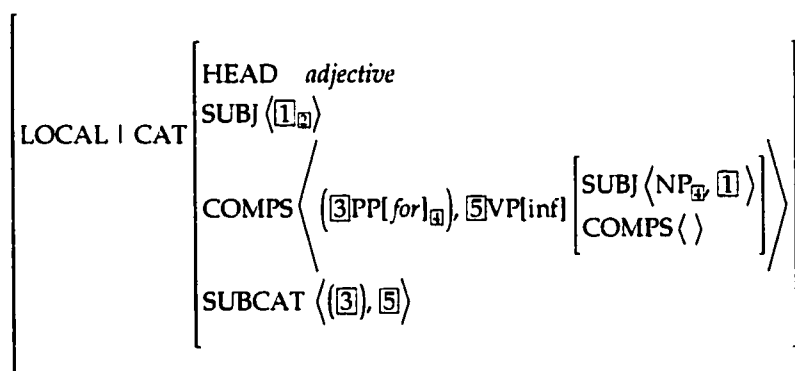
$$\left[\text{SYNSEM} \mid \text{LOC} \left[\text{CAT} \left[\begin{array}{l} \text{SUBJ} \langle \dots \rangle \\ \text{COMPS} \langle \dots, \mathbb{1}\text{NP}, \dots \rangle \end{array} \right] \right] \right] \Rightarrow \left[\text{SYNSEM} \mid \text{LOC} \left[\text{CAT} \left[\begin{array}{l} \text{SUBJ} \langle \dots, \mathbb{1} \rangle \\ \text{COMPS} \langle \dots \rangle \end{array} \right] \right] \right]$$

As (63) shows, the missing object lexical rule converts a lexical category with an NP complement into another category in which an object in the COMPS list becomes the last member of the SUBJ list.³¹ This rule causes the *tough* infinitive to have two subjects. The original subject of a *tough* infinitive will be controlled either by the *for*-phase when present, or pragmatically. The 'raised' object will

³¹ I will restrict my attention to the cases in which the embedded phrases end up with the verb. For a prepositional object, another lexical rule is necessary: one that converts a lexical category with a PP complement into another category without one and by which an original object becomes a subject. Prepositional missing object constructions are analyzed using the missing object lexical rule in conjunction with this second missing object lexical rule.

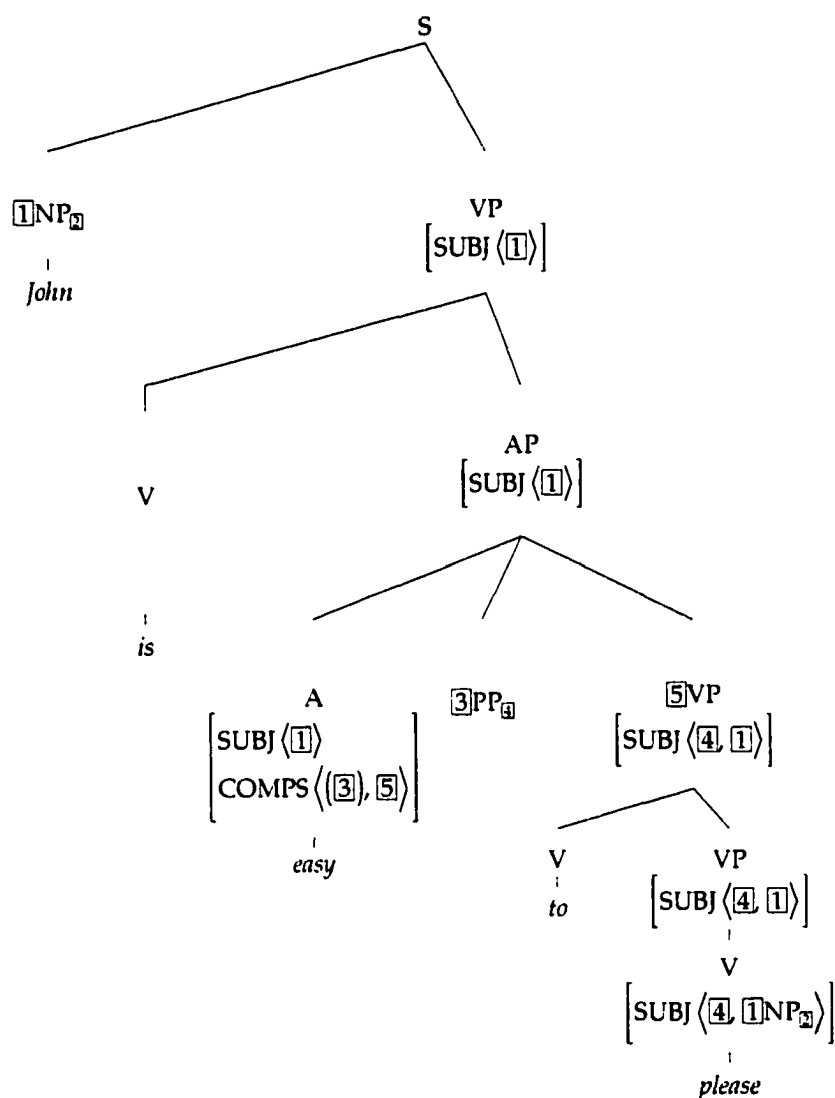
be controlled by an argument in a higher clause. Grover proposes the following lexical sign for *tough* adjectives:

(64) lexical sign for *easy*



(65) is a representation of the structure in (64).

(65) Grover 1995



The *tough* gap is created when the missing argument is promoted, by the lexical rule (63), from the COMPS list to the SUBJ list of the embedded verb's subcategorization structure, seen at the bottom of the tree (65). Then Equi or Raising signs are revised so that they can propagate the promoted subject argument along the local trees. Finally, the Head-Subject schema of standard

HPSG is revised so that it permits a VP to combine with its subject if its subject is a one-member list. The promoted subject argument, $\boxed{\text{NP}_2}$, in (64) is controlled by the *tough* subject in accordance with general principles that govern the relationship between the controlled VP and its controlling semantic subject.

The case mismatch is not problematic. Unlike the standard HPSG treatment in which case assignment is handled lexically (i.e., the lexical head encodes the case information of its complements directly in its SUBCAT list), case is not assigned in the valence lists of lexical items as a by-product of a subcategorization, but by the Case Principle, which assigns case according to an NP's actual position.

There are, however, a couple of problems with Grover's approach. First, the missing object lexical rule affects only an NP; a sentential object cannot be promoted. Second, technically, postulation of more than one subject does not pose any problem in HPSG since the SUBJ values is a list. As Grover admits, however, this move is strange since it seems that the missing object lexical rule is the only English construction in which the SUBJ list has more than two members. It is hard to find constructions in English that have two or more subjects. That is, there is no rule in the grammar that adds elements to a subject list other than the missing object rule. The postulation of the two subjects, then, is not well-motivated.

3.5.7 Bayer 1990

Bayer gives an analysis of the TC within the Categorical Grammar framework. He argues that the TC involves a control, specifically a raising construction, and not an unbounded dependency construction. The assumption that the TC is a species of raising is based on his observation that *tough* predicates pattern more with raising than they do with equi predicates.³²

Bayer uses Jacobson's (1990) Function Composition for his 'raising' analysis of the TC. Function Composition has the function of 'raising' arguments without involving 'movement'.

Bayer assumes that the category type of a *tough* adjective is $S/(S/NP)$. When the adjective function composes with the *tough* infinitive, $(S/NP)/NP$, it gives an expression of adjective plus *to*-infinitive phrase, S/NP . When the adjective plus *to*-infinitive function composes with the *tough* subject NP, it produces a *tough* sentence.

By function composition, any syntactic requirements imposed on the embedded *tough* infinitive will be inherited by the function-composed expression. Thus Bayer's analysis cannot deal with the case mismatch problem. However, Bayer is aware of this potential problem. He argues that the case mismatch problem does not actually arise because he assumes that case is determined by surface position, as in the case of raised arguments.

Since function composition only removes a single argument from one clause at a time, Bayer's analysis also cannot account for multiple extraction phenomena. Moreover, it cannot deal with the long-distance relationship between the *tough* subject and the *tough* gap. For Bayer, the TC is not an

³² For further details, see section 4.2.

unbounded dependency construction; his theory of function composition is for local relations.

Furthermore, as Bayer admits, his theory cannot block extraction of an argument from finite clauses in the *tough* infinitive since function composition does not distinguish between finite and non-finite clauses.

3.5.8 Jacobson 1992

Jacobson also gives an analysis of the TC within Categorical Grammar. Jacobson assumes that a *tough* adjective is of the category $(A/NP)/(VP/NP[ACC])$. When it combines with the *tough* infinitive, $VP/NP[ACC]$, it gives the expression A/NP . This expression is the argument of *be*, a lexical inheritor which inherits the subject selectional properties of the adjective. *Be* is of the category $(S/X)/(A/X)$ where X is a variable over categories embedded under *be*. This gives S/NP . When it combines with a subject, it produces a *tough* sentence.

Unlike Bayer, however, Jacobson argues for an analysis that denies any syntactic connection between the *tough* subject and the *tough* gap. For example, Jacobson argues against any analysis that uses a variable for the *tough* gap. One argument that Jacobson advances against a variable analysis concerns null complement anaphora or VP complement deletion.³³ Consider her example, shown in (66).

³³ For details, see section 4.2.

(66) ?? John is easy for Mary to talk to, but Tom is difficult for Leslie.

In a sentence such as (66), the 'missing' element in the second conjunct is considered to be *to talk to*, and *Tom* is understood to be the object of 'to talk to'. Under a variable analysis, the connection between the *tough* subject and the *tough* gap is made when the *tough* infinitive combines with the *tough* adjective. When the *tough* infinitive is deleted, as in (66), the *tough* subject cannot bind the *tough* gap, a variable, since the *tough* infinitive that contains a gap is missing.

Jacobson then argues that the relationship between the *tough* subject and the *tough* gap is semantic, and the semantic relationship can be accounted for in the following way.

The *tough* adjective entails that the PP stands in the relation represented by the *tough* infinitive to the *tough* subject. Hence, the subject argument of the three-place relation *tough* adjective is interpreted as the object argument of the two-place relation represented by the *tough* infinitive.

She assumes that a *tough* adjective requires three arguments: a *tough* subject, a VP/NP, and a PP. Among these three arguments, two arguments are controllers: the *tough* subject controls the object of the VP/NP, and the PP controls the subject of the VP/NP. For ease of exposition, suppose that the VP/NP denotes a two-place relation R1 between two individuals: one denoted by the PP argument, and the other denoted by the *tough* subject argument. Then the *tough* adjective denotes a three-place relation R2 between two individuals: one denoted by the PP argument, and the other denoted by the *tough* subject argument, and one two-place relation R1.

These control relations can be accounted for in terms of a lexical entailment theory of control. The lexical entailment theory of control says that control relations are one of the entailments that lexical items have. For example, a subject control verb entails something about the individual denoted by the subject, which has the property denoted by its following infinitival complement. This entailment can be represented by a meaning postulate. For example, a subject control verb *want* denotes a relation between an individual and properties such that if any individual x stands in the 'want'-relation to a property P , then in the 'want-world' of x , x has the property P .

In a similar fashion, a *tough* adjective entails that the individual denoted by the PP stands to the individual denoted by the *tough* subject argument in the relation R_2 denoted by the VP/NP. This relation can be represented by the following meaning postulate. Suppose that x , y , R_1 , and R_2 represent denotations of the PP argument: the subject argument, the two-place relation, and the three-place relation, respectively. If any x stands to y in the 'easy' relation R_2 , then y stands to x in the relation R_1 . This is how the *tough* subject argument of the three-place relation is construed as the object argument of the two-place relation.

Since Jacobson's analysis denies any syntactic connection between the *tough* subject and the gap, a case mismatch problem does not arise. However, there are some difficulties with her analysis. Since she rejects any syntactic account of the TC, we are not sure how she can handle some recalcitrant syntactic problems associated with it. For example, she cannot account for the multiple extraction phenomena shown in (52). This is because her Categorical

Grammar analysis does not make a distinction between WH-gaps and *tough* gaps.

Furthermore, as with Bayer (1990), Jacobson cannot block the extraction of an argument from a finite clause in a *tough* infinitive since her analysis does not make a distinction between finite and non-finite clauses in the *tough* infinitive.

3.5.9 Summary

A variety of structural and lexical analyses have been proposed in non-transformational frameworks to accommodate the idea that the TC is a species of WH-construction, and that the occurrence of a *tough* gap depends not on that of a *tough* subject but on that of a *tough* adjective.

Chapter 4 Some crucial theoretical issues reconsidered

4.1 The nature or origin of the *tough* gap: extraction or control?

Over the years the *Tough* construction (TC), an example of which is repeated in (1), has been identified in generative syntax as a species of either extraction (Chomsky 1977, 1981, 1986, Gazdar et al. 1985, Cinque 1990, Pollard & Sag 1994) or control (Rosenbaum 1967, Ross 1967, Chomsky 1973, Lasnik & Fiengo 1974, Schachter 1981, Grover 1995).

(1) John is easy to please.

In this section, I will first review these two accounts of the TC, presenting the arguments in favor of each and examining properties that are hard to account for in terms of either account. I will then argue that the TC is a species of neither extraction nor control, but rather of a third grammatical pattern that shares one salient grammatical property with these other two constructions.

4.1.1 Two accounts

The debate over the extraction vs. the control account of TC can be reduced to the question of how the *tough* gap is instantiated. For the past four decades, this question has been answered in terms of already existing analyses of English syntactic phenomena. That is, the TC has sometimes been treated as a

kind of extraction construction, which includes WH-questions and the topicalization construction, both of which are illustrated in (2).

- (2) a Who do you think John admired?
b Mary, I think John admired.

Alternatively, it has been treated as a kind of control construction, which includes equi and raising phenomena, as in (3).

- (3) a John tried to leave.
b John seems to have left.

4.1.1.1 The extraction account

The extraction account says that the *tough* gap is an 'extracted' argument. This means that the *tough* gap is created when an argument is extracted or displaced to the clause-initial position from an otherwise realized embedded argument position. The extraction account started with Chomsky (1977), and has become the dominant view. For example, as we saw in some detail in the previous chapter, in GB, Chomsky (1986) suggests a D-structure (4a) for sentences such as (1):

- (4) a John is easy [_{CP} [_{IP} PRO to please OP]
b John_i is easy [_{CP} OP_i [_{IP} PRO to please t_i]

In (4b), a trace is created in the missing argument position as a result of the movement of a null operator (OP) to the clause-initial, non-argument position of

the embedded infinitival phrase. This operator is later coindexed with the *tough* subject.

Basically, the same idea has been implemented in monostratal frameworks. In standard GPSG or HPSG, as outlined in Gazdar et al. 1985 and Pollard & Sag 1994, the *tough* gap arises as the value of the gap feature SLASH propagates, via an extraction path, from the gap position to the position where it is cashed out, or receives its value. In Gazdar et al.'s treatment, the SLASH value is cashed out by the *tough* subject at the node of a matrix sentence. In Pollard and Sag's treatment, the SLASH value is cashed out by the *tough* predicate at the node of an AP. The lexical entry *easy* ensures the coindexation of the trace with the *tough* subject in the lexicon.

4.1.1.2 The control account

The control account says that the *tough* gap is a 'controlled' argument in the same way that the understood subject in an equi or raising construction is controlled by an argument of a higher predicate.

Control-type accounts include the *tough* deletion account, which is essentially the same as the Equi-NP Deletion account, and a *tough* movement analysis¹ that parallels the traditional treatment of raising. Control accounts also include some less familiar analyses within monostratal frameworks such as that of Grover 1995.

¹ Refer back to 3.2 for more details on the *tough* deletion and movement analyses.

In Grover's HPSG analysis, the *tough* gap is created when the missing argument is promoted, by a lexical rule, from the COMPS list to the SUBJ list of the embedded verb's subcategorization structure. The promoted subject argument is controlled by the *tough* subject in accordance with general principles that govern the relationship between the controlled VP and its controlling semantic subject.

4.1.2 Arguments for the extraction account

There are three traditional arguments for the extraction account. The first argument concerns the long-distance relationship between a controller and an embedded gap (Ross 1967).² Like the extraction construction, seen in (5), the TC allows long-distance dependency. See (6).

- (5) a Which gadget did you persuade people to buy?
 b Which assignment did you convince the class to try to finish by Friday?
- (6) a That gadget would be difficult to persuade people to buy.
 b This assignment will be impossible for you to convince the class to try to finish by Friday.

In (6), the dependencies between the missing argument positions and their antecedents cross more than one clause boundary.

Jacobson (1992), however, notes that it is sometimes hard to create a deeply embedded gap in *tough* sentences:

- (7) * John is hard for me to imagine Mary wanting to meet.

² Throughout this chapter, I will mention only the first reference that discusses the issue at hand.

Jacobson argues that the ungrammaticality of (7) suggests that there is a difference in grammaticality between a local and a non-local *tough* gap. When the *tough* gap appears within more than one embedded constituent, the *tough* infinitive behaves like an island, as shown by Jacobson's example in (8).

- (8) a Which violin is this sonata easy to play on?
 b * Which violin is this sonata easy to believe John being able to play on?³

Example (8) shows that grammaticality may decline when the number of embedded VPs increases in the TC. That is, the greater the number of VPs embedded in a sentence, the more ungrammatical it becomes. Compare the sentences in (9) and (10), as given by Jacobson.

- (9) a That rock was hard for Tom to try to lift.
 b That rock is hard for me to imagine Tom trying to lift.
 c ??/* That rock is hard for me to imagine Tom thinking John could lift.

- (10) a Which rock did Tom try to lift?
 b Which rock did Tom imagine John could lift?
 c ? Which rock did Tom imagine John thinking Mary could lift?⁴

Jacobson contends that the contrast between (9) and (10) shows that the long-distance relationship between the controller and the embedded *tough* gap is weaker in the TC than in extraction constructions.

³ However, the sentence without the TC is already objectionable:

(i) * This sonata is easy to believe John being able to play on that violin.

⁴ Example (10c) sounds bad to most speakers.

However, the phenomenon that Jacobson believes is observable for the TC might also be seen in other constructions, such as topicalization.

- (11) a That movie I would see again.
 b ? That movie my brother supposes I would see again.⁵
 c ?? That movie Lucy denies Charlie insisted I would see again.

Thus, the ungrammaticality of (7) might be due to a cross-constructional constraint that a structure too structurally complex to process is prohibited.

Furthermore, if Jacobson's speculation is true, the examples in (6) should be ungrammatical, since the *tough* gap is embedded under more than one non-finite VP. Rather, the anomaly shown by (7) seems to be related to the fact that unlike equi verbs, 'Raising-to-Object' verbs usually do not permit raised objects to be separated from their complements, as Berman (1973), Nanni (1978), and Zwicky (1987) independently note. Contrast (12) and (13):

- (12) a * John was foolish for us to expect to marry Leslie.
 b * Leslie was foolish for us to expect John to marry.
- (13) a John was hard for us to persuade to marry Leslie.
 b Leslie was hard for us to persuade John to marry.

Examples (12) and (13) show that TC gaps can occur in the complements of equi verbs but not in those of 'Raising-to-Object' verbs.

Moreover, (7) is certainly unacceptable, but acceptability might have to do with the pragmatic construal, too. The following sentences sound fine:

- (14) a John is hard to imagine saying something like that.
 b The kids were easy for us to prove to be innocent.

⁵ Example (11b) sounds fine to some speakers.

If the ungrammaticality of (7) is due only to syntactic structures, there is no reason that (14) should sound more natural than (7).

In addition, it may be that the resistance of *tough* predicates to long-distance gaps is not universal, as Jacobson maintains, but is limited to individual *tough* predicates. Consider (15).

(15) * Verdi arias are pleasant to hear Mary sing.

In (15), the *tough* predicate *pleasant* does not permit a gap under more than one embedded VP.

The point is that contrary to Jacobson's argument, more complex aspects of semantic, pragmatic and lexical information affect judgments of acceptability in the long-distance dependencies of the TC. I will not delve into the details of the issue. Instead, I will, for the moment, tentatively assume that the TC allows long-distance dependencies.⁶

The second argument for the extraction account concerns island constraints (Ross 1967). Like the extraction construction, the TC is subject to some island constraints.⁷

Consider the following examples.

- (16) a * Who did you imagine the likelihood of introducing?
 b * Who did you imagine the person who introduces?
 c * Who did you describe to Bill this plan to adopt?

⁶ The observed differences between 'Raising-to-Object' verbs and equi verbs will, however, be incorporated into our analysis in chapter 5.

⁷ Alternatively, in more recent terms, it violates the Subjacency Constraint, since the latter subsumes many, though not all, of the island constraints.

- (17) a * John would be difficult to imagine the likelihood of introducing.
 b * John would be difficult to imagine the person who introduces.
 c * John is easy to describe to Bill this plan to adopt.

The examples in (17), like those in (16), are ungrammatical because they violate the Complex NP Constraint, which says that no constituent can be extracted from a complex NP (cf. Ross 1967).

However, given the grammaticality of sentences such as those in (18) and (19), we cannot therefore assume that all complex NPs are islands.

- (18) a Which shirt did you find the button for?
 b Which cookbook did you persuade the library to order a copy of?
- (19) a This shirt is hard to find the button for.
 b This cookbook would be easy to persuade the library to order a copy of.

The difference in grammaticality judgments between examples (16) - (17) and (18) - (19) might be due in part to the 'definiteness' of the complex NP. Consider (20).

- (20) a Who did you look at pictures of?
 b Who did you look at a picture of?
 c ? Who did you look at the picture of?
 d ?? Who did you look at that picture of?
 e * Who did you look at John's picture of?

The sentences in (20) show that extraction of an NP from a definite complex NP is harder than extraction of an NP from an indefinite complex NP.

Moreover, as Grover (1995) observes, some NPs, including picture nouns, behave somewhat differently in the TC than they do in WH-constructions:

- (21) a Who did you sell some photos of?
 b Which country did your professor meet the president of?
 c Which author did you read books by?

- (22) a * Sandy is hard to sell some pictures of.
 b * Iraq would be impossible to meet the president of.
 c * This author is hard to read books by.

Since these examples display parallel syntactic structures, the unexpected difference in grammaticality shown in (21) and (22) might be due to other factors such as lexical information. Consider the following examples, which are taken from Faraci 1974.

- (23) a Who did you take/look at pictures of?
 b What do you think would be difficult to write/read a book about?
 c What did you say is easy to prove/comprehend theorems about?
- (24) a Bill is hard to take/* look at pictures of.
 b This topic would be difficult to write/* read a book about.
 c Prime numbers are easy to prove/* comprehend theorems about.

According to Faraci (1974), the difference in grammaticality judgments in (23) and (24) are due to the peculiarities of the individual verbs, which result in the different constituent structures found in the TC. For instance, in (24a), the noun *pictures*, together with the verb *take*, make a complex predicate, and extraction can occur. However, with respect to the verb *look at*, *pictures* acts more like a canonical noun phrase, and extraction from the complex NP is prohibited.

A similar explanation can apply to (24b) and (24c). For example, in (24b), in *write a book about*, the PP *about* is an argument of *write*, but in *read a book about*, the PP *about* is not an argument of *read*. Hence, the 'write a book about' NP and 'read a book about' NP have different structures and thus behave differently from each other.

Even though the Complex NP Constraint is sensitive to complex information including definiteness and meaning, among other things, for ease of

argument, I will assume that any extraction from a complex NP in the TC is prohibited.

Next, consider the well-known examples in (25) and (26).

- (25) a * What does she wonder where John put?
 b * Who did John tell you when he had seen?
 c * Who do you wonder whether she told the news to?
- (26) a * The red cardboard boxes would be difficult for her to tell you where John put.
 b * Mary would be easy for John to tell you when he had seen.
 c * John would be easy for Tom to ask whether she told the news to.

The *tough* sentences in (26), like the WH-questions in (25), appear to be ungrammatical because they violate the WH-island Constraint: no constituent can be extracted from a WH-complement (Ross 1967).

However, it is not hard to find counterexamples to this generalization.

Consider (27).

- (27) a ? He is the guy who she's been wondering whether she should ask to the prom.⁸
 b ?? John would be difficult for Mary to wonder whether she should ask to the prom.
- (28) a ? Who did you ask why John quarreled with?
 b ? Mary is easy for me to understand why John quarreled with.

Examples (27) and (28) sound fairly acceptable to some speakers, even though they show extraction occurring from a WH-clause. Despite the existence of such examples, I will assume that English disallows extraction from WH-complements in the TC.

Finally, consider (29) - (30).

⁸ This example is attributable to Paul Kay.

- (29) a * Who do you please Mary and?
 b * What did John order and Mary ordered a tuna sandwich?
- (30) a * John is easy to please Mary and.
 b * A tuna sandwich would be difficult to persuade John to order a chicken sandwich and Mary to order.

The sentences in the TC example (30), like those in the WH-extraction example (29), are ungrammatical since they violate the Coordinate Structure Constraint: a conjunct cannot be extracted from a coordinate structure (Ross 1967).⁹

As is well known, moreover, one systematic class of exceptions to the Coordinate Structure Constraint is the 'across-the-board' phenomena, in which the extracted constituent is simultaneously related to a gap in every conjunct of a coordination; and similar to the extraction construction, the TC allows across-the-board phenomena.

- (31) a Which book did you read in one sitting and discuss coherently the next day?
 b This book would be hard to read in one sitting and discuss coherently the next day.

To summarize, as in canonical extraction, island constraints in the TC prohibit the extraction of an NP from certain types of complements.

The final argument for the extraction account concerns parasitic gaps. According to Chomsky (1977), parasitic gaps, in general, do not occur in NP-movement constructions such as passive and raising. Like the extraction construction shown in (32), the TC in (33) allows parasitic gaps.

⁹ However, Goldsmith (1985) and Lakoff (1986) argue that under appropriate semantic conditions, part of a conjunct can be extracted from a coordinate structure.

- (32) a Which paper do you think you filed without reading? (Chomsky 1977)
 b What did Tom eat without first cooking? (Chomsky 1977)
- (33) a This paper would be easy to file without reading. (Chomsky 1977)
 d Rice is difficult to eat without first cooking. (Chomsky 1977)

However, unlike the extraction construction in (34), the TC, shown in example (35), does not allow 'long' parasitic gaps (35a) or parasitic gaps in finite clauses (35b).

- (34) a Which article did you work your way through after figuring out the first section of?
 b Which guy did you exchange letters with before you met?
- (35) a * This article is easy to work your way through after figuring out the first section of.
 b * This guy would be easy to exchange letters with before you met.

Conversely, although parasitic gaps are sometimes not possible with WH-gaps, they are with *tough* gaps.

- (36) a * Whom do you think which movies about to scare my audience with?
 b Dracula is easy to make up movies about to scare my audience with.

Despite the existence of examples such as (35), for the sake of argument, I will assume that English allows parasitic gaps in the TC.

In sum, the arguments traditionally offered in favor of the extraction account include the facts that the TC exhibits long-distance dependencies, is subject to some island constraints, and allows parasitic gaps.

In addition to these three arguments, there are additional characteristics that the TC shares with extraction. First, as in the extraction sentence in (37), crossed gaps are not allowed in the TC, as in (38) (Chomsky 1977).

- (37) * Which sonata did you ask which violin Mary played on?
 (38) * Which sonata is this violin easy to play on?

In (37) and (38), two extracted NPs *sonata* and *violin* are linked by the two following gaps – after the verb *play* and after the preposition *on*; they are the binders of these gaps. Given that (37) and (38) are ungrammatical, we can conclude that double extraction is not allowed in either the extraction construction or the TC.

Second, like the extraction construction in (39b), the extraction of indirect objects in a ditransitive construction is not allowed in the TC, as in (40b).

- (39) a Who did you give the book to?
 b * Who did you give the book?
 (40) a John is not easy to give presents to.
 b * John is not easy to give presents.

The same phenomenon does not occur in control constructions such as passive, as in (41b).

- (41) a * John was given a book to.
 b John was given a book.

Third, like the extraction construction, the TC disallows strong crossover effects; that is, no NP can cross a coreferential NP. See (42).

- (42) a * Who_i do they expect them_i to allow us to invite?
 b * They_i are difficult for us to expect them_i to allow us to invite.

Example (42b) is ungrammatical since association of the *tough* gap and the *tough* subject is made across the coreferential NP *them*.

Finally, like extraction, the TC does not allow its controller to bind two coreferential gaps.

- (43) a * Who did you talk to about?
b * Mary would be difficult to talk to about.

Example (43b) is ungrammatical since the *tough* subject controls the prepositional objects of both *to* and *about*. The same is true of (43a) in the extraction construction.

4.1.3 Arguments for the control account

There are two main arguments for the control account. First, the 'controller' of the *tough* gap occurs in an argument position, (i.e. the specifier of the IP) and not a non-argument position, (i.e. the specifier of the CP), as shown by the case-marking facts in (44) (Schachter 1981).

- (44) He/* Him is tough for me to persuade Sandy to marry.

Second, the TC is licensed only by specific lexical predicates such as *tough*, *easy*, etc., just as control constructions are licensed only by certain predicates such as *try*, etc.

- (45) a This door is impossible/* possible to open.
b John tried/* screamed to open the door. (* agentive reading)

Just as a predicate like *screamed* in (45b) cannot participate in the control construction, a predicate like *possible* in (45a) may not participate in the TC.¹⁰ Extraction constructions, on the other hand, are not normally licensed by individual predicates.

4.1.4 Problems with the extraction and control accounts

As we have seen, some properties of the *Tough* construction are associated with extraction constructions, and others with control constructions. As would be expected, proponents of the extraction account emphasize the extraction properties of the TC while de-emphasizing its control properties, dismissing them as irrelevant or trivial; likewise, proponents of the control account, in emphasizing the control properties of the TC, underplay the construction's similarities to extraction. Thus, as I will outline in the following sections, each account is unable to explain some portion of the data. Furthermore, there are other properties of the TC which neither account can explain. This, too, will be discussed in the forthcoming sections.

4.1.4.1 Problems with the extraction account

First, contrary to the extraction account, the TC is not always an island subject to extraction; grammaticality judgments are speaker-specific (Schachter

¹⁰ See Akatsuka 1979 for a different account of why a predicate like *possible* cannot function as a *tough* predicate.

1981). WH-extraction out of the *tough* infinitive is possible, and multiple gaps are sometimes permitted in the TC examples. However, multiple WH-gaps are not possible in the extraction constructions, as shown in (47).

- (46) a Which violin is this sonata easy to play on?
 b Which people is this idea easy to discuss with?
- (47) a * Which violin did you ask which sonata Mary played on?
 b * Which people did you say which idea you discuss with?

Even though (46) and (47) have nested dependencies between the fillers and the gaps, they show a difference in their grammaticality. This asymmetry is mysterious for the extraction account since canonical extraction constructions are islands subject to extraction, as seen in (47).

Given that (46a) is grammatical and (38) is not, it seems, then, that the acceptability of double extraction in the TC is sensitive to the relative order of binders and gaps. Only the nested gap dependencies are allowed, i.e. the ones in which one binder-gap dependency is contained within another (Chomsky 1977).

However, it seems to me that when nested gaps are more deeply embedded, the TC becomes an island. See (48).

- (48) * Which violin would this sonata be easier to make it possible for John to play on?

Moreover, as Bach (1977) observes, other types of the TC with nested gaps are not allowed. Consider Bach's example, as shown in (49).

- (49) a Which students is this subject easy to talk about with?
 b ? Which table would the book be easy to put on?

Examples (49a) and (49b) share the same nested gap pattern and show no structural difference. However, although (49a) is grammatical, (49b) sounds awkward.¹¹ Bach argues that the grammaticality difference between these two sentences might be attributed to a difference in meaning, since the original source sentences for (49a-b), as shown in (50), show the same degree of difference in meaning.

- (50) a This subject is easy to talk about with the students.
 b ? The book is easy to put on the table.¹²

What may be involved, then, is not only a structural difference, but also a semantic difference.

Thus, sentences such as (38) and (46a), which contrast nested and crossed gaps, may not be part of English syntax *per se*, but rather may ultimately be explained by mechanisms that involve certain aspects of meaning and use. It may simply be that cognitively complex sentences are hard to interpret in canonical contexts.

Second, unlike the extraction construction, the TC does not allow nominative gaps.

- (51) a * John is difficult for me to believe went to Bali.
 b * Mary is tough to imagine bought the house.

¹¹ These grammaticality judgments may be speaker-specific.

¹² Note that Bach's example (49b) may be ungrammatical because its source sentence, as shown in (50b), is semantically unacceptable.

This property is problematic for the extraction account since embedded subject gaps are possible with canonical extraction constructions, as seen in (52).

- (52) a Who do you believe went to Bali?
 b Mary, I imagine, bought the house.

Third, unlike the extraction construction, case-marking in the TC is different between the gap and its antecedent: the antecedent is nominative, but the gap is in the accusative position, as in (53a). This property is problematic for the extraction account since in extraction constructions, the case assigned in the missing argument position carries over to the antecedent, as in (53b).

- (53) a She_{NOM} is easy for me to please ____{ACC}
 b Whom_{ACC} do you think you pleased ____{ACC}?

Fourth, unlike the extraction construction, it seems that referential NPs are required as *tough* subjects, but that neither non-referential complement NPs nor adverbial NPs are.

- (54) a When did Tom decide to submit the dissertation?
 b * This winter would be difficult to decide to submit the dissertation.
- (55) a How many kilometers does he say he drives in an hour?
 b * Two hundred kilometers are difficult to drive for him in an hour.
- (56) a How did he fix the toaster?
 b * That way may be hard to fix the toaster.

This property is problematic for the extraction account because any embedded NPs, regardless of their referentiality or grammatical functions, are accessible to extraction constructions.

Fifth, unlike in the extraction construction, extraction of the direct object in a ditransitive construction is not allowed in the TC.

- (57) a What did you give that man?
b * Those books were not easy to give that man.

This property is problematic for the extraction account since the extraction of any object in a ditransitive construction is possible in canonical extraction constructions.

Finally, unlike in extraction constructions, weak crossover effects are less evident in the TC.

- (58) a * Who_i did his_i lawyer vouch for?
b ? John_i should be easy to persuade his_i lawyer to vouch for.

This property is problematic for the extraction account since the extraction of any object cannot cross an identical NP in normal extraction constructions.

4.1.4.2 Problems with the control account

There is also a problem with the control account. Contrary to that in the control construction, the 'controllee' of the TC must be a non-subject of the non-finite verb phrase, as shown by (59). The ungrammaticality of (59) might otherwise be due to the inability of some speakers to extract from finite clauses.

- (59) a * John is difficult for me to believe _ went to the Bali.
b * Mary is tough to believe _ hates Edna.

This is in contrast to control where the controllee is typically a subject. See (60).

- (60) a * George persuaded his friends (for) them to respect.
 b * Paul tried (for) his colleague to support.

4.1.4.3 Problems with both the extraction and control accounts

There are also problems that undermine the extraction and the control accounts together. First, depending on the speaker, a *tough* gap may or may not be associated with the *tough* subject across a finite clause boundary that does not have a complementizer. For example, while Postal (1971), Bresnan (1971), Hukari and Levine (1991), and Grover 1995 judge the examples in (61) to be ungrammatical, Kaplan and Bresnan (1982), and Pollard and Sag (1994) accept them.

- (61) a %John is difficult for me to believe Mary admires.
 b %Mary is easy for me to think John loved.

The extraction approach cannot account for why extraction from finite clauses is objectionable for some speakers since extraction is perfectly possible with vanilla extraction constructions, such as the ones in (62).

- (62) a Who do you want me to believe Mary loves?
 b John, I really want you to believe Mary loves.

The control approach, on the other hand, cannot account for why extraction from finite clauses is acceptable for other speakers since the controllee of a control predicate typically occurs within a non-finite VP complement, and in (61), the VP complement is finite.

Second, the passive form is not allowed in the *tough* infinitive:

- (63) a * The detective was difficult for John to be interrogated by.
 b John tried to be interrogated by the friendly detective.
 c Who do you think John was interrogated by?

Neither the extraction nor the control approaches can account for why the TC does not allow the passive form since passive forms are acceptable with both vanilla extraction constructions, such as the one in (63c) and with control constructions, such as the one in (63b).

4.1.5 Problems with both GB and HPSG

Despite these apparent problems, the relegation of the TC to either extraction or control is inevitable in most major syntactic frameworks, since most frameworks lack any means to capture the common ground shared by extraction and control. In HPSG (Pollard & Sag 1994, Grover 1995), control is handled in the lexicon, whereas extraction is treated in the syntax, with a strict line drawn between the two components.¹³ In the HPSG account, control and extraction have nothing in common at all except for the notion of partial information sharing. This is usually due to the fact that filler-gap linkages are much more constrained than the relation between a controller and the understood subject of a VP is.

In GB (Chomsky 1977, 1981, 1986, Cinque 1990), both control and extraction are handled in the syntax, but by different modules. Control, is basically regulated by the PRO theorem or by A-movement, and extraction is

¹³ I am speaking here of the 1994 version of HPSG only. The controversial version, e.g. Sag 1997 on relative clauses, might be able readily to translate my analysis.

regulated by A'-movement, the Subjacency Constraint, and some surface filters. Since control and extraction are regulated by independent processes, a unified account of a phenomenon which exhibits some properties of both is not feasible.

4.1.6 The relationship between extraction, control, and the TC.

The observation that the TC has mixed properties of extraction and control can be captured by a tabulation of the relationship between the three constructions in Table 1. Table 1 represents the common ground between the *Tough* and extraction constructions, on the one hand, and the *Tough* and control constructions on the other hand.¹⁴

	Extraction	Control	TC
Non-local argument construal	+	+	+
Long distance dependency	+	-	+
Single valence structure	-	+	+

Table 1. Relationship between Extraction, Control and the TC

Table 1 shows that the TC may be a species of a third grammatical pattern that shares only one property, non-local argument construal, with the extraction and control constructions. That is, an argument is not immediately instantiated in the local valence domain in which it is licensed. In other words, they involve specification of an argument's semantics by an argument that is not realized syntactically within a local structure. So, in the resulting construct, some

¹⁴ The notion 'single valence structure' in Table 1 is explained below.

argument is construed as instantiating a valence requirement of a predicate that occurs in a syntactic domain not governed by that predicate.

The second row of Table 1 indicates that the TC shares with the extraction construction long-distance dependency, absent in the control construction. In control constructions, predicates impose constraints on the understood subjects of their VP complements, not on an argument of a VP contained somewhere in the control predicates' verbal complement.

The third row indicates that the TC shares with the control construction the property, absent in the extraction construction, that the entire construction occurs within a single valence structure. Crucially, in the TC there is no left-isolate sister as a distinct syntactic position, as there is in the extraction construction. In GB terms, this would amount to saying that the *tough* subject occurs in [Spec, IP], although it arrives in the node [Spec, IP] via 'comp-to-comp' movement. The TC itself does not inherit the extraction construction, although it employs valence embedding.

To summarize in CG terms, extraction requires a separate, left-isolated constituent as well as valence embedding for long distance. Control requires a valence set. It needs unification inside valence, but neither a constituent structure nor valence embedding for long distance. The TC requires a long-distance valence set. It needs unification inside valence, and valence embedding for long distance, but not a special constituent structure.

4.1.7 Summary

Transformational grammar has debated for years the issue of whether the TC is 'really' a species of extraction, or 'really' a species of control. I have argued that previous accounts of the TC in terms of control or extraction are not satisfactory. There are two reasons for this claim. First, some properties of the TC pattern more with extraction, and some others pattern more with control. Unless we come up with objective criteria by means of which we can claim that some properties are more marginal than others, any treatment of the TC in terms of already existing constructions is not satisfactory. Second, there are some properties of the TC that cannot be accounted for in terms of extraction or control.

The TC has not only similarities with, but also differences from both extraction and control.

4.2 A reconsideration of the relationship between the *tough* subject and the *tough* gap: control or raising?

Since the introduction of the TC into the transformational grammar arena, one of the central problems has been how to characterize the relationship between the *tough* subject and its corresponding embedded 'missing' object (= *tough* gap).¹⁵ Much has been written and a variety of ideas and analyses have evolved concerning this relationship. Whenever a theoretical framework has undergone a major change, it has been reanalyzed.

¹⁵ The term 'gap' is used here in a descriptive sense, and does not imply any theoretical, analytic framework.

Broadly speaking, there have been two strands of thought about the correct approach to this issue. These are the control and raising accounts. In other words, *tough* predicates, seen in (64a), have been identified in generative syntax either as raising predicates as in (64b) or as control predicates as in (64c).

- (64) a John is easy to please.
 b John is certain to leave.
 c John is eager to leave.

The controversy goes back to the *tough* movement vs. deletion debate, and has been dealt with in one way or another in every framework since then.

Discussions in favor of a control analysis appear in Ross 1967, Lasnik & Fiengo 1974, Chomsky 1977, 1986, Hukari & Levine 1991, Jacobson 1992, and Pollard & Sag 1994, and ones in favor of a raising analysis appear in Rosenbaum 1967, Bresnan 1971, Chomsky 1973, 1981, Gazdar et al. 1985, Hukari & Levine 1987, Bayer 1990, and Grover 1995.

This section critically reviews these analyses in order to lay a foundation for a new analysis of the TC. I will focus on, among others, the following questions: are *tough* predicates raising or control predicates? If *tough* predicates belong to either of these predicate types, why do *tough* predicates show a mix of the syntactic and semantic properties characteristic of raising and control predicates?

I will first argue that *tough* predicates are raising predicates. Second, I will demonstrate that *tough* predicates show control properties when they occur in particular syntactic environments. Finally, I will suggest that these apparent control properties are best accounted for in terms of Brentano's thetic-categorical distinction. I will also show that different members of the *tough* class of

predicates have different semantic relationships with their *tough* subjects, and that even a single adjective may have varying semantic relationships with the subject.

Before proceeding, note that the issue of the status of the *tough* predicate as either raising or control is independent of another related but different problem that I have discussed in section 4.1, the nature and generation of the *tough* gap, i.e. whether the gap should be construed as a controlled or extracted argument.

4.2.1 The raising vs. the control account: preliminaries

The control and raising constructions are defined in various ways. They are expressed in terms of argument structure, thematic role assignment, degree of information sharing, and so on; the discussion around these constructions has been extensive.¹⁶ I do not intend to discuss aspects of all of these characterizations. I will instead focus on some of the characteristics of raising and control which have bearing on the properties of the TC, in particular on the syntactic and semantic characterization of the *tough* subject.

It is worth noting the structure of the argumentation employed in the control vs. raising controversy. Certain syntactic or semantic properties of *tough* predicates are compared with those of canonical control or raising predicates. If the syntactic distributions or semantic conditions of *tough* predicates are shown

¹⁶ For recent discussions of this issue, see Jacobson 1992 and Pollard & Sag 1994.

to be similar to either control or raising predicates, *tough* predicates are argued to belong to that type of predicate.

4.2.2 Basic argument in the raising vs. control account

Even though arguments for or against the raising or control accounts of the TC differ depending on the analyst, the basic difference between the two camps may be reduced to their intuitions about whether or not the *tough* subject can be argued to have some semantic content with respect to the *tough* predicate. While the raising account says that the *tough* predicate imposes no semantic restrictions on the *tough* subject, the control account says that it does. This point is worth emphasizing since most of the arguments in support of either analysis build on this distinction, either implicitly or explicitly.

For example, Bayer (1990), in support of the raising analysis, argues that there is no truth-conditional meaning difference between the sentences in (65).

- (65) a It is difficult to play this sonata on that violin.
 b This sonata is difficult to play on that violin.
 c That violin is difficult to play this sonata on.

Rather, the difference, if it exists at all, amounts to what he calls a different 'avenue of perception' associated with different subjects. For example, difficulty is experienced through the instrument in (65c), but through the music in (65b). According to Bayer, this judged meaning difference also occurs in raising constructions. For example, in (66a), the experiencer of certainty is not mentioned and thus remains unknown; in (66b), however, the experiencer is John.

- (66) a It is certain that John played this sonata on that violin.
 b John is certain to have played this sonata on that violin.

Hukari and Levine (1990), on the other hand, analyze Bayer's data in terms of a control analysis. They argue that *tough* adjectives do have a semantic effect on their subject and that there is a truth-conditional meaning difference in sentences such as those in (65). For example, they claim that the obnoxiousness in (67b) is due to John, but that there is no necessary reason to attribute the state to John in (67a).

- (67) a It is obnoxious to play with John.
 b John is obnoxious to play with.

Hukari and Levine do not provide any linguistic context for this distinction.

Along the same lines, citing personal communication with Dowty, Chae (1992) argues that there are certain contexts in which (65b) and (65c) do not have the same truth-value. There might be a situation in which the sonata is such a complex piece of music that it is difficult to play it on that violin or any other instrument, and in which that violin is such an excellent instrument that it is easy to play difficult pieces on it. In this context, Chae maintains that (65c) would be false, while (65b) would be true. This is because the criteria used for comparing a sonata with other kinds of music are different from those used to compare a violin with other kinds of instruments. This contrast brings about a difference in truth-conditional meaning. Chae argues that the semantic difference between (65b) and (65c) becomes more distinct when these sentences are followed by another clause.

- (68) a ?? This sonata is difficult to play on that violin because the violin is too heavy.
 b ?? That violin is difficult to play this sonata on because the sonata is too long.

Although I agree that the sentences in (68) could sound questionable to native speakers,¹⁷ I am not convinced that they are grammatically unacceptable. The issue here is not purely a truth-conditional difference given the fact that when the NP is replaced by a pronoun, the resulting sentences are grammatical. Consider (69).

- (69) a This sonata is difficult to play on that violin because it is too heavy.
 b That violin is difficult to play this sonata on because it is too long.

Given the subtlety of differences in meaning, and in the absence of any convincing syntactic tests to argue for or against either of the opposing interpretations of the same data, I argue that there is another theoretical possibility, assuming that both interpretations are simultaneously plausible. I will return to this possibility later. Let me first review what kinds of linguistic data and arguments have been advanced for the control or raising analyses of the TC.

4.2.2.1 Arguments for the raising account

The first argument for the raising account concerns complement alternatives (Bayer 1990). It has been observed that raising predicates allow an alternative valence structure in which the subject is the anticipatory dummy *it*,

¹⁷ Example (68a) sounds fine to some native speakers.

and in which the complement is an extraposed infinitive or clause. Control predicates do not exhibit this alternation. Consider (70) and (71).

- (70) a Sophie is certain to win the election.
 b It is certain that Sophie will win the election.
 c That Sophie will win the election is certain.
- (71) a Herman is eager to win the election.
 b * It is eager that Herman will win the election.
 c * That Herman will win the election is eager.

Tough adjectives have alternative valence structures whereby the *tough* predicates either may have a sentential subject or may allow the extraposition of the subject.

- (72) a He is easy to talk to.
 b It is easy to talk to him.
 c To talk to him is easy.

The alternative complementation patterns of *tough* predicates thus favor a raising analysis over a control analysis.

The second argument for the raising account concerns idiom chunks (Bayer 1990). Like raising predicates, *tough* predicates allow a VP idiom chunk to appear as the *tough* subject. Consider (73).

- (73) a Tabs are likely to be kept on anti-war protesters.
 b * Tabs are eager to be kept on anti-war protesters.
 c % Tabs are relatively difficult to keep on anti-war protesters.

In (73c), the NP *tabs* is part of the VP idiom *keep tabs on* but occurs outside its usual object position in the VP. Since raising predicates allow any kind of syntactic entity to be a subject as long as it may appear as an argument of the

downstairs predicate (as in (73a)), (73c), when it is interpreted as grammatical, seems to support a raising analysis.

However, idiom chunks is an area about which people show different grammaticality judgments. The judgments that regard (73c) as grammatical are those of Bayer (1990), in favor of a raising analysis. As we saw in the previous chapter, however, (73c) is regarded as ungrammatical by Lasnik and Fiengo (1974), in favor of a control analysis.

Nevertheless, it seems that there is at least one other set of idioms in *tough* sentences which is accepted by all native speakers of English. Consider (74).

- (74) a Headway is likely to be made in cases like these.
 b * Headway is eager to be made in cases like these.
 c Headway is easy to make in cases like these.

As in the raising sentence in (74a), *headway* is allowed in the *tough* sentence in (74c).

The third argument for the raising account concerns existential entailments. According to Pollard and Sag (1994), existential entailments can exist in control, but not raising sentences. In other words, raising predicates usually show ambiguities between a non-specific reading and a specific reading, whereas control predicates invite only a specific reading. The semantic behavior of *tough* predicates, when they have an indefinite NP argument, also evokes ambiguous readings: specific or non-specific. Consider (75).

- (75) a John expected an alien to visit his home.
 b John persuaded an alien to visit his home.
 c An alien would be easy to find in his home.

The control sentence in (75b) invokes only a specific reading and implies the existence of an alien. On the other hand, both the raising construction in (75a) and the TC in (75c) invoke a non-specific reading as well; both sentences may or may not entail the existence of an alien. In this way, *tough* predicates are semantically more like raising than control predicates.

The fourth argument for the raising account concerns quantifier scope ambiguity (Partee 1977). Consider (76).

- (76) a Every student seems to like some teacher.
 b Every student tried to please some teacher.
 c Many people are easy to talk to.

It seems that only a wide scope reading is possible with raising predicates, as illustrated in (76a). Example (76a) can be paraphrased only as 'every student has some teacher or other that he/she likes'. On the other hand, a narrow scope reading is also available with control predicates, as in (76b). Example (76b) can additionally be paraphrased as 'there is some particular teacher whom every student tried to please'. The TC, as in example (76c), seems to allow only a wide scope reading. That is, *tough* constructions are scopally unambiguous such that in (76c), the quantifier phrase, *many people*, is obligatorily interpreted as having wider scope than the matrix predicate, *easy to talk to*. The interpretation, then, is that 'there are many x, such that it is easy to talk to x', and not 'it is easy to talk to a large group of people'. In this regard, *tough* predicates pattern more with raising predicates.

The fifth argument for the raising account concerns PP complements. Bayer (1990) argues that like raising predicates, *tough* predicates disallow PP complements. Consider (77).

- (77) a * He is likely for something.
 b He is eager for something.
 c * He is easy for something.

However, this observation is not completely accurate since *tough* predicates do permit a dative PP:

- (78) The problem was easy for him.

Moreover, as Jacobson 1992 argues, the fact that *tough* predicates disallow PP complements may be accounted for in terms of a general ban on the ellipsis of VPs with an object gap. This constraint is confirmed by the following sentences:

- (79) a * He is too tired for something.
 b * She is pretty for something.
 c * The chicken is ready for something.¹⁸

The sixth argument for the raising account concerns *tough* infinitives. Bayer 1990 argues that *tough* predicates do not front their VP infinitive complements, just as raising predicates do not. Consider (80).

- (80) a * To win, Jim was almost certain.
 b ? To win, Jim was eager.
 c * To talk to, Jim was easy.¹⁹

Even though the extraction of the complements of a control predicate might result in a grammatically marginal sentence to some speakers ((80b)), its

¹⁸ Example (79c) sounds fine to some speakers.

¹⁹ This should be distinguished from cases in which *tough* predicates select a sentential subject:

- (i) To talk to Jim was easy.

grammatically is still better than the parallel *tough* sentence ((80c)) which matches the raising sentence ((80a)) in unacceptability.

However, this observation is not satisfactory since it has to do with pragmatic construal. Note that (81) is acceptable.

(81) To solve in your head, that problem might be difficult.

Moreover, as Jacobson (1992) argues, the fact that *tough* predicates disallow fronting of their infinitival complements may be accounted for in terms of the constraint on the extraction of VPs with an object gap. This constraint is supported by the following sentences:

(82) a * To talk to, John is too unkind.
 b * To look at, Mary is pretty.
 c * To cook, the beans are ready.

The final argument for the raising account concerns nominalization. Bayer (1990) argues that *tough* predicates do not allow nominalization, much as raising predicates do not.

(83) a * John's likelihood to win
 b John's eagerness to win
 c * John's difficulty to please

Bayer claims that the absence of *tough* nominalization is due to the fact that relative clauses invariably modify the NP to which they are adjoined, and never the subject of that NP.

Jacobson (1992) further argues that the syntactic behavior in (83) is due to a constraint on gapped VP complements in nominalizations. As Bayer notes, however, even in the case of the occurrence of nominalizations without an

argument, *tough* predicates pattern with raising predicates, not with control predicates. Consider (84).

- (84) a the likelihood of winning
 b * the eagerness of winning
 c the difficulty of winning

To summarize, complement alternatives, idiom chunks, existential entailment, scope ambiguity, and nominalization are phenomena that provide evidence for a raising analysis of *tough* predicates.

4.2.2.2 Arguments for the control account

The first argument for the control account pertains to whether or not there are syntactic restrictions on the *tough* subject. It has been observed that *tough* predicates do not allow dummies, such as the expletives *it* or *there*, to be *tough* subjects (Ross 1967). Although it is hard to find cases where dummies serve as objects of predicates (cf. Postal & Pullum 1988), there are some such cases. These are 'Raising-to-Object' cases. Consider (85).

- (85) a * There would be difficult to believe to be a party in the garden tonight.
 b * It would be difficult to believe to be warm tomorrow.
 c * It is easy to believe to bother Mary that Tom will get married.

In (85), the existential dummy *there*, the weather dummy *it*, and the anticipatory dummy *it*, originating as the embedded objects of *believe* clauses, cannot occupy the *tough* subject positions. Parallel to the TC in terms of this constraint, then, is the control construction, as in (87), not the raising construction, as in (86).

- (86) a There is likely to be a party tonight.
 b It is likely to be warm tomorrow.
 c It is likely to bother Mary that Tom will get married.
- (87) a * There is eager to be a party tonight.
 b * It is eager to be warm tomorrow.
 c * It is eager to bother Mary that Tom will get married.

However, Bayer (1990) contends that the ungrammaticality of (85) might not in fact constitute counterexamples, but rather lend further support to the raising analysis. His argument is based on Postal's (1974) observation that raising predicates may not be embedded under other raising predicates. Postal's examples are as follows:

- (88) a ? The bagel was expected by Max to seem to be rotten.
 b * Max expected there to be believed by Irving to be a bagel in his lunch box.
 c ? It is believed to have been found to be raining in Madrid.

Thus, if we regard *tough* predicates as raising predicates, (85) would be accounted for in terms of the ban on repeated raisings.

However, Bayer's argument does not make sense since multiply embedded raising verbs without a dummy subject are fine. See (89).

- (89) John was not expected to seem satisfied.

The second argument for the control account concerns null complement anaphora or VP complement ellipsis. Jacobson (1992) observes that control predicates permit their VP complement to be omitted, whereas raising predicates do not. The phenomenon is more systematic with object raising verbs than with subject raising verbs.

Like control predicates, a *tough* predicate may leave its controlled VP complement unexpressed under appropriate conditions; the missing VP complement is then construed anaphorically. Consider Jacobson's examples, as shown in (90).²⁰

- (90) a * John is certain to win, but I don't think Tom is particularly certain.
 b John is eager to leave, but Tom is reluctant.
 c John is easy to talk to, but Tom is not easy.

According to Jacobson, the VP complement is deleted in the second conjunct in the control construction of (90b), and the missing VP complement is construed anaphorically. The same is true of the TC in (90c). However, the anaphoric interpretation of the deleted VP complement is not available in (90a), a raising example. Hence, *tough* predicates seem to pattern with control predicates, rather than raising predicate in this regard.

Jacobson argues that this may be because the infinitival VP is not a complement of a raising predicate. In other words, control adjectives such as *eager* in (90b) subcategorize for a VP. The ellipsis of this VP can therefore be accounted for by a type of lexical rule that can decrease or increase the number of arguments a predicate requires. Since raising predicates such as *certain* do not subcategorize for a VP, this type of lexical rule cannot be formulated for (90a).

However, it seems to me that VP complement ellipsis is speaker-specific. Some speakers regard (90c) as unacceptable. Moreover, as Jacobson admits, VP

²⁰ This should be distinguished from the type of ellipsis in which a bare VP can drop freely, irrespective of the predicate involved.

- (i) a John is certain to win, but I don't think Tom is particularly certain to.
 b John is eager to leave, but Tom is reluctant to.
 c John is easy to talk to, but Tom is not easy to.

complement ellipsis is not an entirely productive rule. Some subject control verbs do not allow VP complement ellipsis. Consider (91).²¹

(91) * John wants/ attempted to escape, and Tom wants/ attempted, too.

Furthermore, Jacobson argues that a VP complement sometimes behaves like an argument of a control predicate and can be dropped, while at other times behaves like a raising predicate, and thus cannot be dropped. The predicate, *likely*, which is usually taken to be a raising adjective, is a case in point:

(92) John is likely to win, but I don't think Tom is particularly likely.

Although the grammatical judgment given in (92) is not unanimous among native speakers, Jacobson argues that for speakers who permit sentences like (92), the predicate *likely* is not a raising, but a control predicate with the approximate meaning of *prone*. Assuming the grammatical judgments in (90) is valid, VP complement ellipsis supports the control analysis.

To summarize, null complement anaphora and 'dummy-less' *tough* subjects seem to provide evidence for the control account.

4.2.3 Problems with the control and raising accounts

It is very hard to draw a conclusion about whether the *tough* subject receives some semantic content from the *tough* predicate. One set of evidence,

²¹ It seems to me that (91) is ungrammatical because *want* or *attempt* is a transitive verb and does not allow its object to be omitted, whereas (90b) and (90c) are grammatical because *eager* and *easy* are not 'transitive' adjectives that require an infinitival phrase.

including such phenomena as null complement and 'dummy-less' subjects, seems to lend support to the control position that *tough* predicates assign some thematic role to their subjects. On the other hand, other relevant evidence relating to such phenomena as sentential complements, idiom chunks, existential entailment, scope ambiguity, and nominalization gives greater support to a raising analysis.

Faced with this sort of dilemma, most researchers side with either one or the other analysis, emphasizing only the relevant facts to their advantage and dismissing counterproperties as irrelevant or trivial.

After listing all of the available criteria that can be employed to distinguish control vs. raising predicates, for example, Bayer (1990) argues that *tough* predicates are more similar to raising predicates, since more criterial properties comply with a raising analysis than do a control one. Bayer's conclusion is inevitable as long as a strict line is drawn between raising and control predicates and one is forced to opt for just one of the analyses.

Grover (1995) is no exception in the sense that she accepts a strict dichotomy between raising and control predicates, but of interest is her interpretation of the seemingly conflicting features of both control and raising that the *tough* predicates show. Grover, within the framework of HPSG, argues that *tough* predicates are syntactically raising, but semantically control. In other words, she argues that the *tough* subject is in a raising relationship with the *tough* predicate, but is in a control relationship with what she calls the invisible "enablement" predicate which takes the *tough* proposition as its argument.

For Grover, the mixed properties of raising and control in the TC are not problematic. The raising properties are due to syntactic raising features, and the

control properties may be due to semantic control features of the *tough* predicates. Grover considers the 'conflicting' properties of raising and control as therefore not genuinely contradictory since *tough* predicates are in a kind of double relationship with its *tough* subject, each relationship differently characterizing the predicate.

For example, the fact that the TC cannot have dummy subjects is due to the fact that the *tough* subject is role-assigned with respect to the "enablement" predicate. Grover's account, to be sure, is an improvement over the previous ones in that it does not side with just some select facts, but instead tries to accommodate conflicting properties on an equal footing.

4.2.4 New account

I will first argue that *tough* predicates are raising predicates, and that second, *tough* predicates show control properties when they occur in a particular syntactic environment. Thus, the seemingly contradictory features of the TC are no longer conflicting; they are simply features of the TC. Finally, I will show how these apparent control properties are best accounted for in terms of Brentano's thetic-categorical distinction.

I will also demonstrate how there may be semantic differences among *tough* predicates and that different adjectives of the *tough* class predicates have different semantic relationships with their *tough* subjects. Furthermore we will see that even a single adjective may have varying semantic relationships with the subject.

The observation that *tough* predicates display mixed syntactic and semantic properties of raising and control may be related to the additional semantic conditions imposed on *tough* predicates by the thetic-categorical distinction proposed by Franz von Brentano and followed by Anton Marty.

Brentano challenged the traditional Aristotelian classification of a clause into a logical subject and a predicate (Kuroda 1972). He argued that there are two different ways of perceiving and stating a state of affairs. These are categorical and thetic judgments. The categorical judgment corresponds to the Aristotelian classification. The thetic judgment presents a state of affairs as wholly new. In other words, according to Brentano, the speaker may choose a topic as a basis for his predication and predicate something about this topic, or may center his predication on the situation as a whole. In thetic judgments, therefore, (1) the whole event is perceived as a new situation, (2) no identifiable referent is presupposed in the addressee's consciousness, and (3) no referent is linguistically encoded as a topic (= topicless all-comment structure). In categorical judgments, (1) the whole event is not to be perceived as a new situation, (2) an identifiable referent is presupposed in the addressee's consciousness, and (3) the referent is linguistically encoded as a topic, and the rest of the sentence predicates something of the referent (= topic + comment structure).²²

It was Kuroda (1972) who first seriously applied the distinction to the study of grammar. He argued that the distinction between thetic and categorical

²² Summarized like this, the thetic vs. categorical distinction seems to be a notional variant of a distinction made by the information structure. That is, thetic judgments seem to be a manifestation of 'neutral descriptions', which contain all new information, and categorical judgments of a 'topic-comment structure' (or 'theme-rheme'), which contain new information about an old established topic. However, Sasse (1987) argues that the thetic vs. categorical distinction is independent of the information structure phenomenon. See Sasse 1987 for details.

judgments account for the difference in morphological marking between the Japanese subject particle *ga* and the topic particle *wa*. Compare (93) and (94).

- (93) Inu ga hasitte iru.
 dog running is
 'There is a dog running.'
- (94) Inu wa hasitte iru.
 dog running is
 'The/ A dog is running.'

Example (93) shows that *ga* is used to encode a state of affairs, running, in which an entity, a dog, is the one who is performing the action of running; example (94) shows that *wa* is used to encode a topic, the dog, of which the action of running is predicated. Whenever there is a topic (i.e. some entity about which something is to be said), it is marked by *wa*, and the sentence is interpreted as categorical, whereas a subject is marked by *ga*, and the sentence is interpreted asthetic.

In English, distinguishing betweenthetic and categorical readings depends on whether the accent falls on the subject or predicate (Bolinger 1954, Chafe 1974, Sasse 1987). See (95), where capitalization indicates accent.

- (95) a The GUY won.
 b The guy WON.
 c The GUY WON.

Example (95a) represents athetic judgment, while examples (95b-c) represent a categorical judgment. That is, in thethetic reading, the accent is assigned only to the subject, but in the categorical reading, the accent is assigned to the predicate and is further optionally assigned to the subject.²³

²³ For other syntactic phenomena in other languages that may reflect thethetic vs. categorical distinction, see Sasse 1984, 1987, and Rosengren 1997.

I assume that *tough* predicates, with subjects capable of referential functions, may have either thetic or categorical readings. Thus, my account predicts that (64a), repeated here as (96a), invites both of the interpretations shown in (96c) and (96d).

- (96) a John is easy to please.
 b It is easy to please John.
 c 'John has a property such that people find it easy to please him.'
 d 'The act of pleasing John is easy.'

Example (96a) is ambiguous in terms of inviting either a thetic or a categorical reading. In the former reading, it can be paraphrased as 'it is easy to please John'. In this reading, (96a) shows no truth-conditional meaning difference from (96b). In the latter reading, however, it can be paraphrased as 'John has a property which makes him easy to please', and this contributes a truth-conditional meaning difference from (96b). This difference is more obvious in the following examples:

- (97) a John is easy to talk to about Bill.
 b Bill is easy to talk to John about.

Example (97a) has the same meaning as (97b) when both (97a) and (97b) are interpreted thetically: 'It is easy to talk to John about Bill'. Example (97a) has a different meaning from (97b) when both (97a) and (97b) are interpreted not thetically, but categorically. In that case, (97a) means 'John has a property such that people find it easy to talk to him about Bill.', while (97b) means 'Bill has a property such that people find it easy to talk to John about him.' In other words,

'easiness' with respect to such an event is viewed as an inherent property of John in (97a), but of Bill in (97b).

The thematic-categorical distinction made with the semantics of *tough* predicates produces the seemingly conflicting grammatical properties of raising and control shown in examples (72)-(90). In (72a), the entire situation is viewed as new, and (72b) and (72c) must have a thematic interpretation. In (73) and (74), because there is no entity *tabs* or *headway* that can already exist in the addressee's consciousness, (73c) and (74c) must have a thematic interpretation. In (75c), an indefinite NP *an alien* may or may not exist in the addressee's consciousness, and both a thematic (hence non-specific) and a categorical (hence specific) reading are possible. In (76c), since the indefinite NP *many people* may or may not exist in the addressee's consciousness, both a categorical/wide scope reading and a thematic/narrow scope reading are possible. In (85), the expletives *it* and *there* cannot establish themselves as topics, so only a thematic reading is possible. In (90), the referential NP *John* can exist in the addressee's consciousness, evoking a categorical reading.

4.2.5 Summary

I argue that *tough* predicates are thus raising predicates, that the 'conflicting' properties of raising and control are not genuine, and that they share properties of control predicate types when they occur in a particular syntactic environment. The control-like properties of *tough* predicates appear only in the syntactic environment of the TC. I hypothesize that this results from the fact that the 'raised' NP in the subject position may be taken to be a topic, i.e., the subject

of a categorical judgment. This mark of judgment presupposes that the addressee already has the referent of the subject in mind, and that the rest of the sentence provides a comment on that topic. Taken as categorical judgments, a sentence such as (98a) tells us something about icebergs whereas a sentence like (98b) tells us something about ships.

- (98) a Icebergs are easy to sink ships with.
 b Ships are easy to sink with icebergs.

Such judgments invite the inference that the comments regarding icebergs and ships are assertions that icebergs and ships have, respectively, the properties of ability-to-sink-ships and propensity-to-be-sunk-by-icebergs. Inferences of this kind create the impression that in categorically independent TC sentences, the subject is semantically marked by the predicate, establishing the basis for syntactically control-like properties.

4.3 The syntactic category of *for* in the *for*-NP phrase: preposition or complementizer?

There have been two approaches to analyzing the *for* +NP sequence in example (99).

- (99) John was easy for me to please.

The traditional approach has been to analyze the *for* + NP sequence in (99) as a PP of the *tough* predicate (Bresnan 1971, Berman and Szamosi 1972, Berman 1973, 1974, Chomsky 1973, 1977, 1981, Lasnik & Fiengo 1974, Nanni 1978, Bayer 1990, Jacobson 1992, Pollard & Sag 1994, Grover 1995). I will refer to this

approach as the *preposition analysis*. However, Rosenbaum (1967), Gazdar et al. (1985), Richardson (1987), and Hukari and Levine (1990) offer another approach, arguing that the *for* + NP sequence comprises a complementizer and the subject of an embedded clause. I will refer to this as the *complementizer analysis*.

I will argue that the *for*-NP phrase, in general, should be treated as a PP but may sometimes be interpreted as a complementizer and a lower subject when the *for*-NP occurs in special syntactic and semantic conditions.

4.3.1 The constituent structure of the *for*-NP phrase

The key difference between the preposition and the complementizer accounts rests on opposing views about the constituent structure of the *for* +NP sequence. According to the preposition account (100a), the *for*-NP phrase in (99) is a single constituent; in the complementizer account (100b), it is not.

- (100) a John was easy [for me] [to please]
 b John was easy [[for] [me to please]]

However, neither account provides any convincing arguments for or against the accuracy of identifying constituent structures. Even simple constituency tests do not yield an unambiguous answer to this issue.

For example, displacement (Chomsky 1973, Lasnik & Fiengo 1974) may support the preposition account. The *for* +NP sequence may occur in sentence-initial or -final positions. In other words, the *for* +NP sequence can move around in a sentence as shown in (101):

- (101) a For me, John was easy to please.
 b John was easy to please for me.
 c For whom was John easy to please?

Under the preposition analysis, the mobility of the *for*-NP phrase in (101) is easy to explain since the *for* +NP sequence can act as a single constituent and occur in normal PP positions.²⁴ Under the complementizer analysis, however, the mobility shown in (101) would be difficult to explain, since a complementizer and a subject cannot form a constituent. The following sentences demonstrate this:

- (102) a It is unlikely for John to order salad.
 b * For John, it is unlikely to order salad.
 c * It is unlikely to order salad for John.
 d * For whom is it unlikely to order salad?

Example (102) shows that the *for* +NP sequence in raising constructions, as a complementizer + subject sequence, cannot move around.

However, Hukari and Levine (1990) argue that the 'floating' *for* +NP sequences in (101) are not displaced PPs. They support their claim with evidence based on properties of the adjective *worth* observed by Bayer (1990). The adjective *worth* subcategorizes for a VP complement with a gap and an optional *for* +NP sequence. Consider (103).

- (103) a For John, the movie is worth watching.
 b The movie is worth watching for John.
 c For whom is the movie worth watching?

²⁴ However, as Nanni (1980) observes, the *for*-NP phrase is more easily displaced from a *tough* adjective than a canonical PP complement from its canonical position.

- (i) a For me, the puzzle was difficult.
 b ? About the student, the teacher was concerned.

In (103), as with the *tough* predicate in (101), the *for* +NP sequence can occur in both the sentence-initial and -final positions. However, unlike *tough* predicates, *worth* does not allow the *for* +NP sequence to precede the complement, as shown in (104).

(104) * The movie is worth for John watching.

Example (104) may show that the mobility of the *for* +NP sequence has no bearing on the PP-hood of the *for* -phrase. If the mobility phenomenon proves whether or not the *for* +NP sequence in question is a PP, there is no easy explanation for why the *for* +NP sequence can not occur before the adjective *worth* in (104). From this observation, Hukari and Levine argue that (101) does not prove that the *for* +NP sequence is a PP.

In response to Hukari and Levine, Jacobson (1992) argues that the difference in grammaticality between (101) and (104) relates not to the properties of the missing object predicates, but to the difference between infinitival and gerundive complements. Jacobson argues that (104) is ungrammatical because it violates the independently motivated condition of linear order that gerundive complements cannot be separated from their adjective head. Infinitival complements show no such constraint.

In order to show the independent motivation of this condition of linear order, Jacobson provides the following sentences:

(105) a This paper was easier than pie to read.
 b * This paper is worth more than he thinks writing.

Following Jacobson, we can assume that (105a) is grammatical, even though some speakers find it unacceptable. However, they still prefer (105a) to (105b). According to Jacobson, the grammatical difference between (105a) and (105b) depends on the grammatical properties of the complements of missing object predicates rather than the *tough* predicates themselves.²⁵ If this claim is correct, then examples such as (104) would not contradict displacement tests as in (101). Hukari and Levine's argument do not necessarily hold, then, and displacement tests remain a possible argument for the preposition account.

Unlike displacement tests, however, constituency tests such as coordination, right-node raising, and ellipsis (Gazdar et al. 1985) may support the complementizer account. Consider (106).

- (106) a These labor conditions were difficult for the employer to offer, and for the employees to accept.
 b My offers were easy, but yours were difficult, for employees to accept.
 c These labor conditions were easy for Kenneth to accept, and those ones were easy too.

The complementizer account can easily account for (106) since only constituents can be coordinated, righnode-raised, and elliptical. Under the preposition account, then, the grammaticality in (106) is hard to explain since a

²⁵ Another possible account is that the ungrammaticality of (105b) is presumably because 'worth' is a preposition. As a preposition, 'worth' is always followed by a gerund or noun phrase, and cannot be followed by a PP. The fact that 'worth' cannot stand alone as a predicate may prove this. See (i).

- (i) a * Reading the book is worth.
 b Reading the book is worth it.

The syntactic category of 'worth' is, however, controversial since it has mixed properties of an adjective and a preposition. As an adjective, 'worth' can be modified by an adverb. See (ii).

- (ii) How much is this antique worth?

PP plus an infinitival phrase cannot be a constituent. Example (106) may demonstrate that the *for* +NP sequence and its following infinitive comprise a complementizer + embedded subject + infinitival VP sequence, rather than a matrix dative [i.e. a PP] + infinitive sequence.²⁶

However, things are more complicated than they appear. Other constituency tests such as comparative construction, modifier construction, and parenthetical construction argue against the complementizer analysis and for the preposition account. Consider (107) - (109).

- (107) a * The new hourly rate was more difficult for the employer to offer than for the employees to accept.²⁷
 b The new hourly rate was more difficult for the employer to accept than for the employees.
- (108) a * The new hourly rate was especially difficult for the employees to accept, though not so much for the employer to offer.²⁸
 b This hourly rate was especially difficult for the employer to accept, though not so much for the employer.
- (109) a * This hourly rate is easy, don't you think, for every employee to accept.²⁹
 b This hourly rate is easy for every employee, don't you think, to accept.³⁰

Examples (107)-(109) show that the *for* +NP sequence can be separated from its following infinitival phrase in comparative, modifier, or parenthetical

²⁶ Note that the grammatical judgments for (106) are in sharp contrast to those of Nanni (1978), who rejects the *for*+NP string as a constituent. Moreover, Gazdar et al. (1985) are cognizant of such examples as (i), and take the *for*-phrase in such cases to be a modifying adverbial.

(i) This problem will be difficult to solve for the students who arrived late.

²⁷ This sentence, however, seems acceptable for some native speakers.

²⁸ This sentence, however, seems acceptable for some native speakers.

²⁹ This sentence, however, seems okay with some native speakers.

³⁰ This sentence, however, does not seem okay with some native speakers.

constructions, respectively. They demonstrate that the *for* +NP sequence may be a PP.

As we have seen, different constituency tests suggest mixed conclusions about the constituent structure of the *for* +NP sequence and do not definitively favor one account over the other.

4.3.2 Arguments for the preposition account

First, there are certain semantic restrictions on the NP in the *for*-NP phrase. Dummy NPs (e.g. *there*, *it*) or inanimate NPs cannot occur in the *for*-NP phrase, a restriction first observed by Bresnan (1971). Just as the object of a dative *for* +NP sequence, the NP of the *for*-NP phrase must be animate. Consider (110) - (112).³¹

- (110) a * This plaza would be hard for there to be a strike in.
b * John is impossible for there to be a movie about.
- (111) a * President's weekend is impossible for it to snow on in Berkeley.
b * Webster would be easy for it to be obvious that Elaine loves.
- (112) a * Mary would be impossible for that Hollywood movie to amuse.
b * Government officials are easy for political scandals to surprise.

³¹ However, there seems to be exceptions to this generalization. Consider (i) - (iii), which are taken from Ioup 1975.

- (i) a ?? This winter will be hard for there to be enough food to get through.
b ?? Such tangled issues are always hard for there to be much more agreement on.
- (ii) a ?? John would be especially impossible for it to turn out that Mary likes.
b ? By constructing a roof over the stadium, we will make the field almost impossible for it to rain on.
- (iii) a This alley would be inconvenient for more than a few cars to park in.
b A six-foot coffin is easy for any corpse to fit into.

Under the preposition analysis, the ungrammaticality of (110) - (112) is easily accounted for since the examples violate the selectional restrictions imposed on the *for* +NP sequence by the *tough* adjective. Under the complementizer analysis, however, it would be difficult to account for the ungrammaticality of these examples because a complementizer does not impose any semantic requirement on the following embedded subject of the infinitival phrase. For example, raising predicates that can take the complementizer *for* do not impose any selectional restrictions on their embedded infinitival complements. See (113).

- (113) a It would be unlikely for there to be a riot in this park.
 b It would be unlikely for it to bother Bill that Mary left.
 c It would be unlikely for the ghost movie to frighten Mary.

Hukari and Levine (1990), however, provide a different reason to explain the semantic restrictions on the NP of the *for*-NP sequence in the TC. They argue that it is a meaning postulate that prohibits a dummy or an inanimate NP in a *for*-NP phrase. They hypothesize that the *for*-NP phrase is the syntactic subject of the lower clause as well as the semantic argument of the *tough* adjective. For example, syntactically, *easy* in (99) is a two-place predicate, requiring two phrases: *John* and *for me to please*; semantically, it is a three-place predicate, taking three arguments: *John*, *for me*, and *to please*. Therefore, there is a syntax-semantics mismatch. Due to this meaning postulate, the dative PP is always suppressed, and the lower subject controls the experiencer of the higher predicate.

However, Jacobson disagrees with Hukari and Levine by maintaining that there is no such meaning postulate; that is, no such control relation exists. She argues that it is not theoretically possible to interpret the lower subject as the

argument of the *tough* adjective since syntactic information about a lower clause's internal structure would then be needed. She concludes that Hukari and Levine's argument is thus not persuasive.

Second, as shown in (114), the *for*-NP phrase, irrespective of whether it is an animate or a dummy, cannot occur more than once in the TC (Chomsky 1973).

- (114) a * The hard work is easy for the rich for the poor to do. (Chomsky 1973)
 b * Caroline will be unpleasant for Miriam for Brian to meet.

Under the preposition analysis, (114) is easy to account for since a sentence does not allow two occurrences of a dative complement. Under the complementizer analysis, however, (114) is hard to account for since it would allow a sentence to have two *for* +NP sequences, one for a dative PP and the other for a comp + lower subject sequence. The fact there is a restriction that does not permit more than one *for* +NP sequence in the TC lends support to the preposition analysis.

Third, it is well-known that the *for* +NP sequence can appear by itself without an accompanying *tough* infinitive, as in (115a).

- (115) a This book would be easy for Mary.
 b This book would be easy for Mary to understand.

Unless we claim that the *tough* predicate *easy* in (115a) is different in meaning and subcategorizes differently than that in (115b), the preposition analysis readily accounts for both (115a) and (115b). Example (115) shows that the *tough* adjective requires a *for* +NP sequence as a complement, but does not require an infinitive as another complement. Under the complementizer analysis, however, (115a) would be difficult to account for since a complementizer phrase

cannot stand alone in a sentential complement. The grammatical presence of a *for* +NP sequence without the *to*-infinitival phrase in the TC thus lends support to the preposition analysis.

Fourth, in English, PP objects may be equi controllers (Grover 1995). See (116).

- (116) a John appealed to Sue to support his campaign.
b John was easy for me to please.

In (116a), the PP *to Sue* controls the unexpressed subject of the embedded infinitive *to support his campaign*. In other words, the relationship between the PP and the unexpressed subject of the embedded infinitive in (116) seems to be equi, rather than raising. Likewise, the *for* +NP sequence in (99), repeated here as (116b), seems to control the unexpressed subject of the embedded infinitive *to please*. If the *for* +NP sequence is an equi controller, then the *for* +NP sequence may be a PP.

4.3.3 Arguments for the complementizer account

The first argument for the complementizer account concerns anaphora. As shown in (117), the *for* +NP sequence may bind a reflexive (Hukari & Levine 1990).

- (117) a That pond will be hard for Mary to get a good look at herself in.
b This sliver of soap will be tough for Mary to wash herself with.

Under the complementizer account, the reflexive *herself* and the binder, *Mary* occur in the same clause, which is consistent with the widely accepted

assumptions that reflexivization is purely structural, and that the anaphor is in the same binding domain as the binder. This could not be the case if the *for* +NP sequence were a higher dative PP, because *Mary* and *herself* would then belong to different binding domains. In other words, under the preposition account, the binder binds the reflexive across the clause, which would violate the canonical binding condition of a reflexive.

However, Hukari and Levine's argument against the preposition analysis is not persuasive since the *for*-phrase could be a PP that controls the unexpressed subject of an infinitive VP. See (118).³²

(118) I bought soap for the children_i [_i to wash themselves_i with].

Under their account, the grammaticality of (118) would be difficult to account for since the binder *children* and the reflexive *themselves* do not belong to the same clause.

In addition, consider (119), in which a reflexive pronoun is found in a picture-noun phrase that is raised from its clause by relativization.

- (119) a The picture of herself that Mary painted last weekend was really terrible.
 b The story about herself that Helen told in public was very sad.

One would expect that the clause-mate condition, which requires an anaphor and its antecedent to occur in the same clause, would not accommodate 'long-distance' anaphora, in which an anaphor and its antecedent are in separate clauses within the same sentence. And yet, despite the fact that in both sentences

³² Example (118) is attributable to Paul Kay.

the reflexive *herself* precedes its antecedent *Mary* across a clause, (119) is considered grammatical.

Furthermore, there have been approaches that account for anaphora additionally in terms of semantics and pragmatics or discourse, denying the validity of a purely syntactic interpretation. For example, according to Kuno (1987), anaphora is governed by not only syntactic, but also pragmatic conditions, such as the empathy or awareness conditions. Zribi-Hertz (1989) proposes that anaphora is governed not by the syntactic same-clause condition, but by the same-discourse domain condition. These accounts suggest that the argument for the complementizer analysis in terms of syntactic anaphora data is not persuasive.

The second argument for the complementizer analysis concerns parasitic gaps. There are examples that show parasitic gaps occurring in the *for*-NP phrase (Hukari & Levine 1990). See example (120).

- (120) a % This play is difficult for reviewers of to criticize.
 b % Clinton would be easy for colleagues of to disrespect.

Although grammatical judgments of (120) are divided among speakers, let us suppose that the examples are grammatical, as Hukari and Levine do. Under the complementizer analysis, the grammaticality of (120) can be easily explained. The real gap after the verbs and the parasitic gaps in the *for* +NP sequence belong to the same lower clause. Example (120) could show that the *for*-NP phrase belongs to the lower clause.

Under the preposition account, however, the grammaticality of (120) is problematic, because the *for*-NP phrase is outside the gap domain. Recall the

syntactic assumption that the real gap and the parasitic gap do not c-command each other.

However, proponents of the complementizer analysis still need to explain why examples like (121) are less acceptable than the ones like (120), though neither (120) nor (121) is entirely acceptable:

- (121) a * John will be easy for people who agree with to vote for.
 b * These books are hard for reviewers who read to praise sincerely.

In other words, the complementizer analysis should account for why a parasitic gap is worse in a clause than in a PP.

Moreover, proponents of the complementizer analysis should also explain why an example such as (122) is less acceptable than the ones in (120).

- (122) * John would be hard for pictures of to frighten.

In (122), *for* is a complementizer since its following NP denotes an inanimate object. In other words, the complementizer analysis should account for why a parasitic gap in an inanimate NP is less desirable than the one in an animate NP.

Additionally, parasitic gaps in animate NPs are not quite acceptable themselves when they and real gaps belong to the same clause. Consider (123).

- (123) * John is hard to convince friends of to invite.

Example (123) is ungrammatical, even though both the real gap and the parasitic gap belong to the embedded clause. In addition to the fact that the grammaticality of sentences such as those in example (120) is suspect, examples

(121) to (123) indicate that the *for*-NP phrase should not be treated as a complementizer and an embedded subject.

The third argument concerns complement structures displayed by *tough* predicates (Soames & Perlmutter 1979). Alternative complement structures that involve *tough* predicates may show that the *for* +NP sequence is a complementizer + lower subject, as in (124).

- (124) a This book would be easy for Mary to read.
 b For Mary to read this book would be easy.
 c To read this book would be easy for Mary.

Soames and Perlmutter claim that (124a) and (124b) share the same meaning. If this were the case, the *for*-NP phrase in (124a) could not be anything other than a complementizer + subject phrase. Otherwise, one would have to propose two different functions of the *for*-NP phrase in each (124a) and (124b).

However, I do not agree. I assume that (124a) and (124b) do not unequivocally share the same meaning. In (124a), I think that it is clearly Mary who would experience ease. Example (124b), however, does not explicitly mention who would experience ease. Example (124c), in fact, seems to be the more unambiguous equivalent to (124a) than (124b) does.

4.3.4 Two different types of *for* +NP sequences

So far I have shown that the *for*-NP phrase should be treated as a prepositional phrase. However, there seems to be cases in which *for* may be interpreted both as a complementizer and as a preposition. In other words, there

are some types of *tough* sentences, in which the *for* +NP sequence invokes an ambiguous reading. Consider (125).

- (125) a Such a tiny room would be difficult for more than four adults to sleep in.
 b This assignment would be hard for most of the employees to finish on time.

Example (125a) can be ambiguous simply because the *for* +NP sequence can be both a dative or an embedded subject. In other words, (125a) can be interpreted either as (126a) or (126b).

- (126) a Sleeping in such a tiny room would be hard for more than four adults.
 b For more than four adults to sleep in such a tiny room would be hard.

The dative interpretation of (126a) commands a distributive reading, as shown in (127a). However, the embedded subject interpretation of (126b) commands a collective reading, as shown in (127b).

- (127) a There are more than four adults who would have difficulty sleeping in such a tiny room.
 b It would be difficult to squeeze more than four adults at a time into such a tiny room.

I assume that the ambiguous readings that examples such as (125) invoke are due to the fact that the *for* +NP sequences are quantifiers, having no bearing on whether the *for* +NP sequence is a dative PP or a complementizer plus a subject.

There are *tough* sentences in which the *for* +NP sequence is not semantically related to the *tough* adjective.

- (128) a The Titanic is impossible for any iceberg to sink. (Berman 1973)

- b This substance will be difficult for the acid to dissolve. (Ioup 1975)
- c This material is impossible for my scissors to cut. (Ioup 1975)

For example, in (128a), the *for* +NP sequence is not an argument of *tough* adjectives.³³ This is shown by (129).

(129) * For any iceberg, the Titanic is impossible to sink.

Example (129) shows that the *for*-NP phrase cannot front a sentence, and that it is not a constituent. The argument that the *for* +NP sequence in (128a) is not a dative can be shown by (130).

(130) * To sink the Titanic is impossible for any iceberg.

If the *for* +NP sequence in (130) is a dative, there is no reason why the reading in (130) should be ruled ungrammatical.

But notice here that the semantics of *tough* adjectives are not homogeneous. For example, *impossible* is different from *amusing*, since the meaning of *amusing* allows only the dative reading, as shown in (131).

(131) The trained dolphins are amusing for kids to watch.

Unlike (128a), (132) is therefore ungrammatical.

(132) * The Titanic is amusing for any iceberg to sink.

In (132), 'for any iceberg' cannot be construed as a complementizer + lower subject sequence. Hence, the function of the *for*-phrase in the *tough* construction

³³ Unless each example personifies the objects – iceberg, acid, scissors.

sometimes depends on the lexical meaning of individual *tough* predicates involved.

4.3.5 Summary

First, I argue that the *for* +NP sequence is a dative PP in canonical cases. Second, there are some ambiguous *tough* sentences whose *for* +NP sequence can be considered as either a preposition or a complementizer, especially when the *for* +NP sequences are quantifiers. Third, the *for*-phrase of *tough* sentences should sometimes be treated as a complementizer + subject sequence, depending on the lexical meaning of each *tough* predicate.

4.4 The syntactic category of the *tough* infinitival phrase: VP vs. IP vs. CP analyses

As we saw in previous sections, around the early 1970s, there arose a rift surrounding analyses of the TC: *tough* movement vs. *tough* deletion. This issue concerned the category of the infinitival phrase – whether the *tough* adjective subcategorizes for a VP, an IP, or a CP.³⁴ While Bresnan (1971), Lasnik and Fiengo (1974), Brame (1975), Jones (1991), and Jacobson (1992) argue for VP, Berman and Szamosi (1972), Berman (1974), and Hukari and Levine (1990) argue for IP. Chomsky (1977) proposes a CP analysis.

³⁴ Here, I use contemporary terms, IP and CP, in lieu of the original S and S'.

In this section, I will summarize the arguments of each analysis with some commentary, ultimately showing how the VP analysis provides the most convincing arguments.

4.4.1 The VP vs. IP analysis

4.4.1.1 Bresnan 1971

It was Bresnan who first proposed a VP analysis of the infinitival phrase of both the TC and its extraposition counterpart. She presented several pieces of evidence in support of her claim that *tough* adjectives subcategorize for a VP complement, and not an IP,³⁵ and that the *for*-NP phrase hence must be analyzed as a PP, rather than a complementizer + subject. Bresnan's arguments for the VP analysis are as follows.

First, the dummy *there* cannot appear after *for*, as shown in (133).

- (133) a * It would be tough for there to be at least some interviewees on time due to the heavy snowstorm.
 b * It would be amusing for there to be a party on the beach.

If the infinitive were an IP, the unacceptability of sentences such as (133) would be surprising. Predicates that require a sentential complement allow the dummy *there* as the infinitival subject, as evidenced by (134).

³⁵ This issue should be distinguished from that of whether or not the *for*-phrase is a PP. In other words, granting that the *for*-phrase is a PP does not rule out the possibility that the *to*-inf phrase might be analyzed as a sentence with its empty subject coreferential to the NP of the *for*-phrase.

- (134) a It would not surprise me for there to be countless strikes among the trade unions.
 b The hospital is eager for there to be at least some nurses on call.

Second, there are some semantic restrictions on the object of the *for*-NP phrase. For instance, an inanimate NP cannot appear after *for*.

- (135) a * It was tough for a book on doll-collecting to please John.
 b * It was tough for that theory on imitative fallacy to become known.

An IP infinitive complement would not impose any specific semantic conditions on what should follow *for*. Predicates that take a sentential complement may have inanimate NPs as the subject of the infinitive:

- (136) a It would surprise me for a book on Bartok to please John.
 b Sandra was eager for that theory on avian metabolism to become known.

Third, predicates that select IP may allow its sentential complement to move to the beginning of a sentence:

- (137) a It is surprising for a priest to act that way.
 b For a priest to act that way is surprising.

However, such an alternation is not allowed in the *tough* sentences:

- (138) a It is hard for a man to sit that way.
 b * For a man to sit that way is hard.
 c It is tough for interns to grasp the concept.
 d * For interns to grasp the concept is tough.

Fourth, two instances of a *for*-NP phrase might occur if the complement were IP: one with the matrix PP, the other with the complementizer + lower subject. However, such examples are not found with *tough* predicates:

- (139) a * It would be tough for Grace_i for her_i to decline this offer.
 b * It was difficult for us_i for us_i to arrest that suspect.
- (140) a It is gratifying for John for his sister to settle this quarrel.
 b It would be surprising for Tom for Sarah to marry that old guy.

Fifth, objects of an embedded clause under a *tough* predicate may not move out of its sentential boundary to the matrix subject position. Consider (141):

- (141) a * You are tough for me to believe that Harry hates. (Postal 1971)
 b * This lesson is impossible for you to expect that the class will finish before recess.

If the *tough* adjective could subcategorize for an IP, there would have to be an ad hoc stipulation to block ill-formed sentences such as (141). However, if *tough* movement is attributed to a VP complement, the inappropriateness of (141) would follow from the fact that objects cannot move out of a normal sentential complement.

Finally, Bresnan points out that if a predicate can subcategorize for either an IP, an NP, or an AP, there is no reason that a predicate such as a *tough* predicate cannot select a VP as its complement.³⁶

To summarize, Bresnan argues that all of the above grammatical data and theoretical apparatus are consistent with the VP hypothesis.

4.4.1.2 Berman & Szamosi 1972 and Berman 1974

Berman and Szamosi and Berman counter Bresnan's VP analysis by proposing instead a sentential analysis of the TC and its corresponding extraposition construction. They dismiss the empirical points that Bresnan provides as unconvincing.

First, Berman and Szamosi argue that there are *tough* predicates that permit an occurrence of the dummy *there* after *for*.

- (142) a It is impossible for there to be no mistakes in that paper.
b It is a nuisance for there to be so many exams to grade.

They agree, however, that the *for-there* sequence is not allowed in the TC:

- (143) a * That paper is impossible for there to be no mistakes in.
b * Eli is impossible for there to be a musical about.

³⁶ Furthermore, Bresnan argues that given an ordering hypothesis, sentence stress is correctly predicted under the VP analysis. But Berman and Szamosi regard the ordering hypothesis as suspicious, claiming that it does not correctly predict sentence stress.

They argue that the reason for the lexical restrictions on the TC, as opposed to the extraposition construction, is that the *for*-phrase might serve as both a matrix PP as well as a complementizer + lower subject in the former.

Second, Berman and Szamosi argue that there are also *tough* predicates that allow inanimate NPs after *for*.

- (144) a It was impossible for that theory on avian metabolism to become known (since you didn't publish it).
b It is not easy for my butter knife to peel this pear.

Third, Berman and Szamosi argue that there are *tough* predicates that allow a sentential complement to be moved.

- (145) a It is impossible for Alice to dislike William.
b For William to dislike Alice is impossible.

Fourth, contrary to Bresnan's intuitions, they maintain that the double occurrence of a *for*-NP phrase is possible as long as they are not coreferential.

- (146) a It would be tough for Trevor for his boss to decline this offer.
b It would be difficult for Toyota for Honda to solve that problem.

Note that they agree, however, with Bresnan that a double occurrence of the *for*-NP phrase is not allowed in the TC:

- (147) a * This offer would be tough for Trevor for his boss to decline.³⁷
b * That problem would be difficult for Toyota for Honda to solve.

³⁷ This sentence should be distinguished from (i):

- (i) For Trevor, this offer would be tough for his boss to decline.

Note that in (i), *For John* is in the topic position, as marked by a comma, and evokes a sentential adverbial reading, rather than a dative reading.

They point out that the restriction on the TC, as opposed to the extraposition construction, is due to a formal condition of the *tough* movement rule, that a matrix dative PP and the subject of the infinitive clause should be the same.

Fifth, they agree with Bresnan's observation that the TC does not allow the object NP to move across a sentence boundary (cf. (141)). However, they argue that the restriction might be due to a formal characteristic of the TC, upon which they do not elaborate.

Sixth, Berman (1974), responding to Bresnan's argument that a VP should be considered as another type of complementation, argues that those predicates that permit a VP complement usually also allow an IP complement, and that those VP complements are usually made up of IPs that have undergone a syntactic transformation. She maintains, moreover, that a closer look at the predicates that Bresnan claims allow only a VP complement can actually also take a passive complement. For example, the verb *try* can have a passive complement, as can *tough* predicates:

- (148) a John tried to be selected for that play.
 b The doctor tried to be elected by the committee.
 c It was difficult for John to be selected for that play.
 d It was easy for the doctor to be elected by the committee.

Finally, Berman observes that a double occurrence of *tough* predicates in the TC is not possible, as in (149).

- (149) a * These chapters are impossible to be easy to teach.
 b * This poem is difficult to be hard to read.

Berman argues that, under Bresnan's VP analysis, it is possible to get (149a) if the underlying structure (150a) is embedded in another predicate *impossible*. This process is shown in (150b). In other words, under the VP analysis, there is

nothing wrong with the process of stacking *tough* predicates. Unless some ad hoc condition were stipulated, it would be hard to prohibit (149a).

- (150) a be easy (for PRO) to teach these chapters.
 b [_{IP} be impossible (for PRO) [_{VP} be easy (for PRO) to teach these chapters]]

Berman argues that the IP hypothesis predicts the inappropriateness of (149a) since its underlying structure might be (151a).

- (151) a [_{IP1}[_{IP2}(for) PRO to teach these chapters easy (for PRO)] impossible (for PRO)]
 b [_{IP1}for these chapters to be easy to teach] be impossible

Note that there are two cycles in (151a), and that there are two possibilities for the application of *tough* movement. If we apply *tough* movement at the embedded node, IP₂, we will get (151b). When we apply the same rule at the matrix node, IP₁, we cannot get (151b). The phrase, *these chapters*, is in the subject position of the embedded clause, and the *tough* movement rule cannot move a subject. However, if *tough* movement is not applied to an embedded clause, it cannot be applied to the matrix clause: the structural description of the TC specifies that the constituent immediately embedded under the predicate triggers *tough* movement.

To summarize, Berman and Szamosi and Berman argue that Bresnan's data for the VP complementation hypothesis cannot be taken as representative,

and they argue that there are strong indications that the infinitive should be analyzed as a sentential complement.^{38 39}

4.4.1.3 Brame 1975

Brame points to inadequacies in the arguments of Berman and Szamosi, lending support to Bresnan's VP hypothesis. Brame points out that the counterexamples that Berman and Szamosi provide do not have any bearing on the issue of the VP hypothesis. Berman and Szamosi's observation, for example, that there are *tough* predicates that allow a sentential complement to be moved, is due to dialectal differences in subcategorization and cannot be a convincing argument for IP- or VP-hood.

³⁸ Lasnik & Fiengo (1974) also argue that the transformational rules that have IP as part of a structural description may not be involved in the TC. No passive sentence is allowed in conjunction with *tough* movement, as shown in the following examples of Lasnik and Fiengo.

- (i) a * John is easy for Bill to be outsmarted by.
b * These arguments were impossible for Max to be convinced by.

The data showing that a sentential input transformation – such as a passive construction – is not possible in (i) may demonstrate that the *tough* infinitival phrase is not a VP, but may be an IP.

However, Lasnik and Fiengo's argument is not correct. For unknown reasons, the passive construction is possible with *tough* predicates. See (ii).

- (ii) a Such flattery is easy to be fooled by. (Chomsky 1964)
b John is not hard to be flattered by.
c The doctor was hard for John to be examined by.

Moreover, the 'get/have' passive construction, a sure sign of VP-hood, is possible with *tough* predicates. Consider (iii).

- (iii) a * The police are easy to be arrested by.
b The police are easy to get arrested by.
c This group is difficult to get accepted by.

³⁹ Note, however, that their constituency tests show only that the infinitival phrase cannot be taken to be an IP. That is, they only cast doubt on the possibility of treating the infinitive as a VP, and do not explicitly argue for IP-hood.

Brame notes that Bresnan was even aware that predicates such as *good*, *bad*, *sweet*, *pleasant*, *appropriate* allow a dual subcategorization for IP as well as VP:

- (152) a It would be good for Becca to stay.
 b For Becca to stay would be good.
 c To stay would be good for Becca.

When these predicates subcategorize for IP as in (152b), for example, they allow the double occurrence of a *for*-NP phrase as in (153).

- (153) It would be good for John for Becca to stay.

This duality extends even to genuine *tough* predicates for some researchers. For example, Postal (1971) maintains that the following sentence shows structural ambiguity:

- (154) It was difficult for Tony to rob the store.

In one case, *difficult* subcategorizes for the VP *to rob the store*. In this sense, the difficulty is directly associated with Tony. However, in the other case, *difficult* subcategorizes for the IP *for Tony to rob the store*. Here, a more generic attribution of difficulty is expressed.

Brame also argues that while Bresnan's VP analysis can explain the data provided by Berman and Szamosi, a problem arises when Berman and Szamosi try to account for Bresnan's VP data. Brame notes that, for example, regarding the absence of the *for-there* phrase and the double *for*-NP phrases, Berman and Szamosi posit the subcategorization of *tough* predicates as PP + IP. They employ an equi-NP deletion rule and an obligatory rule that changes IP into VP in order to get a PP + VP sequence. Brame argues that since the purpose of these

restrictions is to bring about a VP structure, it might be desirable to get past these unnecessary complexities from the beginning.

4.4.1.4 Lasnik & Fiengo 1974

Lasnik and Fiengo take Brame's argument one step further. Brame identifies the source of discrepancies noted by Berman and Szamosi as a problem of a subcategorization; Lasnik and Fiengo assert that this problem of subcategorization is due to different meanings associated with *tough* predicates. In other words, the assumed problem of syntax caused by subcategorization associated with *tough* predicates is rather a problem of semantics, invoked by different meanings of *tough* predicates. A change in the semantic sense of a *tough* predicate will correspond, therefore, to a change in its complement subcategorization type. Berman and Szamosi's and Bresnan's seemingly conflicting data are therefore not contradictory.

Let us now see how Berman and Szamosi's data can be reconciled with Bresnan's under Lasnik and Fiengo's semantic account.

First, regarding the possibility of the double occurrence of the *for*-NP phrases, for example, compare (146a), repeated here as (155a), and (155b).

- (155) a It would be tough for Trevor for his boss to decline this offer.
 b This offer is tough for Trevor to decline.

According to Lasnik and Fiengo, (155a) may be paraphrased as 'For his boss to decline this offer would be tough on Trevor'. On the other hand, (155b) may be paraphrased as, 'In Trevor's case, this offer can be declined only with difficulty'.

Lasnik and Fiengo refer to the former interpretation as the 'tough on' reading and the latter as the 'tough for' reading.

Overall, sentences such as (155a) denote "the effect of a state of affairs or situation on an entity," and *tough* predicates describe "the way in which the entity is affected" (Lasnik & Fiengo 1974). On the other hand, sentences such as (155b) describe "an entity in terms of action on or change of state of that entity," and *tough* predicates describe "the action" (Lasnik & Fiengo 1974). The 'tough on' reading selects an IP complement. The 'tough for' reading selects a VP complement. In other words, *tough* predicates are usually ambiguous between 'tough for' and 'tough on' readings. These differences in meaning may be involved in the dual subcategorization of VP and IP in the TC and its corresponding extraposition construction.

Second, Berman and Szamosi note that the dummy *there* may occur as an object of the preposition *for* (cf. (142)). Lasnik and Fiengo assert that *tough* predicates that allow the dummy *there* after *for* take on the 'tough on' rather than 'tough for' reading.

Third, Berman and Szamosi's observation that a *tough* predicate may occur with a sentential subject (cf. (145)) is also explained by the 'tough on' reading. In (145b), for example, the predicate, *impossible*, denotes denial since it can be paraphrased as 'not possible'. When a *tough* predicate has the 'tough for' reading, it cannot take a sentential complement. Semantically, 'tough for' cannot describe a proposition or a state of affairs, but only an action or change of state. Example (145) describes the former, not the latter.

Finally, as we saw earlier, one of the criticisms Berman (1974) levels at Bresnan concerns cases where a double occurrence of *tough* predicates is not

allowed (cf. (149)). Lasnik and Fiengo argue that on the semantic side, *impossible* in (149a) means 'not possible.' It does not modify an action or change of state and thus justifiably cannot undergo *tough* movement.

But Lasnik and Fiengo argue that even on the syntactic side, Berman neglects to account for another possibility that stems from their analysis for the derivation of (149) from the possible underlying structure shown in (150): extraposition at the embedded node IP₂, then *tough* movement at the matrix node IP₁. If the extraposition rule is applied to IP₂, it produces the intermediate stage of (156):

(156) For it to be easy to teach these chapters is impossible.

When the *tough* movement rule is applied to IP₁, it gives the final form of (157):

(157) These chapters are impossible to be easy to teach.

Hence, under Berman's analysis, this derivation of (149a) would wrongly license the result, as shown in (157), as grammatical. But we have seen that example (157) should be judged ungrammatical.

The ungrammaticality of (149a) can be explained using the VP analysis, under which the underlying structure of (149a) is (158).

(158) * It is impossible to be easy to teach these chapters.

Since the underlying structure of (158) is ill-formed anyway, the ill-formedness of the surface sentence of (149a) is predicted.

In conclusion, Lasnik and Fiengo argue that the multiple subcategorizations of *tough* predicates are due to semantic differences associated

with the predicates. They identify two different senses of *tough* predicates that influence syntactic behavior: the 'tough for' and 'tough on' readings. They maintain that the TC can be associated only with the former reading, but that the extraposition construction can be associated with both the former and latter readings.

4.4.1.5 Hukari & Levine 1990 vs. Jacobson 1992

Hukari and Levine argue that Bresnan's arguments do not provide evidence for VP-hood. First, they argue that Bresnan's observations that the dummy *there* or an inanimate NP cannot appear after *for* may be explained in terms of semantics.

They say that, semantically, *tough* predicates are three-place predicates, taking as arguments the *tough* subject, *for*-phrase, and infinitival phrase. However, syntactically, the *for*-phrase serves as the syntactic subject of the sentential infinitival phrase, not as the dative PP of *tough* predicates. Hence, the non-existence of the dummy *there* or an inanimate NP does not provide evidence for VP-hood.

Jacobson refutes Hukari and Levine's claims. First, she argues that since Hukari and Levine's proposal is a mismatch between the syntactic and semantic structures, it needs to propose a meaning postulate. This postulate should guarantee that the subject of the *tough* infinitive is a semantic argument of the *tough* adjective. Jacobson argues that there is no easy way to propose such a meaning postulate. This is because a meaning postulate cannot deal with the syntactic structure of the *for*-phrase argument.

Second, she claims that the sentence shift test that Bresnan adduced for evidence in (137) and (138) is not an appropriate test of IP-hood. Consider the following examples by Jacobson.

- (159) a * That John is a spy seems/ appears/ happens/ turns out.
 b It seems/ appears/ happens/ turns out that John is a spy.

According to the sentence shift test, the *that*-clause in (159) cannot be sentential since it does not allow the shift of the complement in (159a). If it were sentential, (159a) would not be inappropriate.

However, there are counterexamples to (159). Consider (160).

- (160) a That John is a spy is likely.
 b It is likely that John is a spy.

Unlike the raising verb construction in (159), the raising adjective construction in (160) allows a sentence shift. Therefore, whether a predicate allows a sentence shift or not depends on the part of speech involved. Example (159) cannot be taken as a genuine counterexample to the sentence shift test.

4.4.1.6 Jones 1991

Jones provides some theory-internal evidence against IP-hood. First, the aspectual *have* is not allowed in the TC. Jones' examples follow.

- (161) a It was great to have worked for Sally.
 b * Sally was great to have worked for.
- (162) a It will be easy to have read Moby Dick by the time I get to college.
 b * Moby Dick will be easy to have read by the time I get to college.

Since the aspectual *have* occurs outside of a VP, (162) shows that the *tough* infinitive may not be sentential.

Second, the non-intentional *be* is not allowed in the TC. This is based on Williams' (1983) proposal that there are two types of *be*: main verb *be* and auxiliary *be*. The main verb *be* occurs in the VP, but the auxiliary verb *be* occurs outside of the VP. See (163).

- (163) a It is easy to be proud of my son.
b * My son is easy to be proud of.

Example (163) may show that the *tough* infinitival phrase is not sentential.

4.4.2 The CP analysis

Chomsky (1977) proposes a CP analysis of the *tough* infinitival phrase. He offers two kinds of arguments for this analysis: theoretical and empirical. His theoretical arguments stem from the observation that the TC shows certain characteristics normally associated with WH-constructions: it allows long-distance dependencies, it observes various island constraints, and it shows parasitic gaps.⁴⁰

Chomsky's empirical evidence for the CP analysis comes from the *tough* adjective + nominal construction. Chomsky's example is given in (164).

- (164) a This is an easy violin on which to play sonatas.
b This is a pleasant room in which to work.

⁴⁰ See 4.1 for details.

Example (164) shows that the *tough* adjective + nominal construction allows a WH-item when its governing preposition comes before the *tough* infinitival phrase. Chomsky assumes that the infinitival phrase in both the *tough* adjective + nominal construction, as in (164), and the TC, as in (165) are the same, being complements.

- (165) a This violin is easy to play sonatas on.
b This room is pleasant to work in.

Chomsky then argues that a WH-item is present in the underlying structure of the TC, though it is not realized in the surface form, as in (166).

- (166) a This violin is easy on which to play sonatas. (underlying structure)
b This room is pleasant in which to work. (underlying structure)

However, Chomsky's analysis of the TC, based on its superficial resemblance to the *tough* adjective + nominal construction, may be empirically wrong. There seems to be syntactic, semantic, and lexical differences between the TC and the *tough* adjective + nominal construction.⁴¹

First, the infinitival phrase in the *tough* adjective + nominal construction allows an overt complementizer, as shown in (164), whereas the *tough* infinitival phrase in the TC does not, as shown in (167).

- (167) a * This violin is easy on which to play sonatas.
b * This room is pleasant in which to work.

The absence of a WH-operator in the TC may show that the *tough* infinitival phrase is not a CP.

⁴¹ The following arguments are based on Jones 1982, 1983.

There are certain other syntactic differences between the TC and the *tough* adjective + nominal construction. Chomsky asserts that in the former, the infinitival phrase can be separated from the *tough* adjective, as in (168a), and in the latter, the infinitival phrase can be separated from the NP. See (168b).

- (168) a How easy this violin is to play sonatas on!
 b What an easy violin this is to play sonatas on!

However, Jones points out that when the infinitival clause contains an overt WH-item, the TC and the *tough* adjective + nominal construction invoke different grammaticality judgments. Consider (169).

- (169) a * How easy this violin is on which to play sonatas!
 b What an easy violin this is on which to play sonatas!

Example (169) shows that an infinitival clause with a WH-item can be separated from the *tough* adjective + nominal construction, but not from the TC. There is no reason to suppose that the position of a WH-item in (169a) is different from the one in (169b) in Chomsky's analysis. The stated grammatical difference between (168) and (169) might thus be problematic.

Second, the function of the infinitival phrase may be different between the TC and the *tough* adjective + nominal construction. In the former, it may act as a complement, and in the latter, it may act as an adjunct to a preceding noun. The *tough* adjective + nominal construction thus seems to behave like an infinitival relative clause. Consider (170).

- (170) a This is an easy violin on which to play sonatas.
 b This is a beautiful violin on which to play sonatas.
 c This is an easy and beautiful violin on which to play sonatas.

If the infinitival phrase in the *tough* adjective + nominal construction is a complement in (170a), then the syntactic similarity of (170a) and (170b) needs a separate syntactic account. This is because the infinitival phrase in (170b) is both an infinitival relative clause and an adjunct. Otherwise, as (170c) shows, the coordination of *tough* predicates with the canonical adjective is hard to explain.

Third, the range of predicates that can participate in the TC and that of predicates that can participate in the *tough* adjective + nominal construction are not identical. There are some predicates that cannot license the TC but can license the *tough* adjective + nominal construction, and vice versa. These predicates include *unlikely*, *bizarre*, and *unwise*. Consider the following examples.

- (171) a This is an unlikely situation in which to find oneself.
 b * That situation is unlikely to find oneself in.
 c To find oneself in that situation is unlikely.
- (172) a This is an unwise hypothesis on which to rely.
 b * This hypothesis is unwise to rely on.
 c To rely on this hypothesis is unwise.
- (173) a That is a bizarre premise on which to base a theory.
 b * That premise is bizarre to base a theory on.
 c To base a theory on that premise is bizarre.

4.4.3 Summary

There have been three claims to identify the constituent structure of the *tough* infinitival phrase: VP, IP, CP. The VP analysis advocates (Bresnan 1971, Lasnik & Fiengo 1974, Brame 1975, Jones 1991, and Jacobson 1994) provide convincing arguments and data to support their position: the absence of cases with *for*-NP phrases, the absence of sentence shifts, the absence of *tough*

movement out of a sentential complement, and the absence of VP gaps with respect to complementation.

The IP analysis advocates (Berman & Szamosi 1972, Berman 1974, and Hukari & Levine 1990) maintain that the *tough* infinitival phrase should be taken as an IP, providing data that only seem incompatible with the VP analysis; a closer look at this data shows that these differences are dialectical – a problem of syntactic subcategorization dependent upon the different semantic connotations associated with *tough* predicates.

The CP analysis (Chomsky 1977) provides theoretical and empirical evidence to argue that the infinitival phrase should be analyzed as a CP. However, the arguments are theory-internal and thus not persuasive. The data is shown to be empirically wrong.

4.5 The grammatical function of the *tough* infinitival phrase: complement or adjunct

The *tough* infinitival phrase traditionally has been analyzed as a complement of a *tough* adjective (Bresnan 1971, Lasnik & Fiengo 1974, Chomsky 1977, 1981, Koster 1987, Pesetsky 1987, Jacobson 1992, Pollard & Sag 1994). Under this analysis, a *tough* adjective selects the infinitive constituent. Proposals have also been put forward to analyze the *tough* infinitival phrase not as a complement, but as an adjunct to the *tough* adjective (Nanni 1978, 1980, Jones 1991).

In this section, I will review the arguments for both positions and assert that the infinitival phrase is a gapped complement and, as such, behaves

somewhat differently from a canonical complement. Its apparent shared properties with an adjunct may be due to this syntactic peculiarity.

4.5.1 The complement vs. adjunct account: the basic controversy

The complement account says that the *tough* infinitive is subcategorized for by the *tough* adjective. The adjunct account, on the other hand, says that the *tough* infinitive modifies the *tough* adjective and is not subcategorized for by the *tough* adjective. In the latter account, then, the *tough* infinitive could be deleted without affecting the grammaticality of the TC.

The basic controversy revolves around the issue of whether or not the *tough* adjective and its following infinitival phrase form a single constituent. The complement account asserts that they do; the adjunct account claims otherwise. Consider (174).

- (174) a Barney is difficult to dislike and Betty is, too.
 b Difficult to meet though Clinton was, Tom met him four times in six months.
 c What Mary has always been is impossible to please.

Since the sentences in (174) show the *tough* adjective + infinitival phrase getting (a) deleted, (b) preposed, and (c) pseudo-clefted – three criteria for constituency – example (174) thus supports the complement account.

WH-extraction is another characteristic of a complement that we can see with the *tough* adjective and its infinitival phrase. The examples in (175) show WH-movement of lexical heads and their complements; in the parallel examples

in (176), the *tough* adjective and its infinitival phrase also prepose by way of WH-extraction.

- (175) a How concerned about his butler is the gentleman?
 b How suspicious of his son is Daniel?
- (176) a How easy to tease is Peter?
 b How simple to fool was the gardener?

Further evidence that the *tough* adjective and its infinitive compose a constituent can be found in the right-node raising, exclamation, and prenominal constructions. See examples (177) - (179).

- (177) a Greg certainly is – and Elizabeth may well be – easy to converse with.
 b College may be – and high school was – hard to pass.
- (178) a How easy to tease Peter is!
 b How hard to pass the law boards were!
- (179) a a hard-to-explain phenomenon
 b kind and hard-to-upset man

Examples (177) - (179) show that *tough* adjective + infinitival phrases act like canonical head-complement structures.

In favor of an adjunct analysis, however, Nanni (1978) argues that the *tough* adjective + infinitival phrase does not form a constituent when a *for*-phrase intervenes between the *tough* adjective and the infinitive, when the *tough* adjective is followed by more than one infinitive, or when the adjective is modified by an adverbial. Consider (180) and (181).

- (180) a */% How difficult for James to take was that medicine?
 b */% How difficult for the students to master was the material?

- (181) a */% How difficult to persuade the students to master was the material?
 b */% How difficult to try to get to take was the medicine?

Nanni claims that in examples (180) and (181), the *tough* adjective + infinitival phrase cannot WH-move, especially when the infinitival phrase is long. However, grammaticality judgments about examples (180) and (181) are divided among native speakers. For example, (182) does not sound as objectionable to some native speakers as (180) and (181) do to others.

- (182) a Hard for the children to tease though John was, they managed to pull pranks on him daily.
 b Hard to convince to leave though she probably will be, Tom tries to subtly hint at his wishes anyway.

The examples in (180) to (182) show that the *tough* AP is less tightly composed than a regular head-complement structure and thus is not a canonical head-complement structure. Notice, however, that the constituency tests only show that the *tough* + infinitival phrase is not a complement of a normal structure, and do not necessarily argue for its status as an adjunct.

4.5.2 Arguments for the complement account

First, it has been widely assumed that, the TC, as shown in (183a), can be reformulated into the extraposition construction, as shown in (183b), in which the *tough* infinitival phrase acts as a constituent. Since both constructions are identical in meaning, it follows that the *tough* adjective + infinitive should also be considered a complement in the *tough* construction.

- (183) a Jessica is easy to defeat, but John is difficult to defeat.
 b It is easy to defeat Jessica but difficult to defeat John.

Second, it has been shown that infinitival adjuncts can be stacked (Jones 1991). Consider (184).

- (184) a ?This magazine is too expensive to buy (in order) to read.
 b ?This magazine is not interesting enough to read (in order) to buy.

As adjuncts, both *to read* and *to buy* modify the adjectives in the *too* and *enough* constructions.

In the TC, however, infinitival phrases cannot be stacked. See (185).

- (185) a * This letter is difficult to read to understand.
 b * This letter is difficult to find to read.

Given that *tough* infinitival phrases cannot be stacked, as adjuncts can, they may be more similar to complements.

Third, the *tough* infinitive can conjoin with other regular complements (Gazdar et al. 1985). Consider (186).

- (186) President Kim's English was good but difficult to understand.

Note that in (186), the *tough* infinitival phrase *difficult to understand*, which is also an adjectival phrase, conjoins with the adjectival phrase *good*. Note also that the AP *good* is a complement. Following the assumption, often implicit in linguistic literature, that only phrases of the same grammatical function can be conjoined, example (186) suggests that the *tough* infinitival phrase *difficult to understand* is also a complement.

Fourth, the *tough* infinitive has an obligatory missing object. See (187).

- (187) a Eugene is easy to please.
 b * Eugene is easy to please him.

If the *tough* infinitive were an adjunct, (187a) would be an exceptional case of an infinitival adjunct obligatorily containing a gap; no other such case in English grammar exists. This exceptionality casts doubt on considering the grammatical function of the *tough* infinitival phrase as an adjunct.

Fifth, when an embedded clause is an adjunct to the matrix clause, the extraction of adjuncts, such as *when* in (188), from both the embedded and the matrix clauses is possible. On the other hand, when an embedded clause is a complement to the matrix clause, the extraction of *when* is possible only from the matrix clause and not from the embedded clause (Contreras 1993). Consider (188).

- (188) a When has Alexis been hard to please?
 b When was Alexis reluctant to speak?
 c When did Alexis run to stay fit?

Sentences such as (188c), where the infinitival phrase is an adjunct, could be read as ambiguous since extraction from the embedded as well as the matrix clauses should be possible. The question of 'when' can be applied either to 'Alexis running' or to 'Alexis running for the purpose of staying fit'. On the other hand, sentences such as (188b), where the infinitival phrase is a complement, are unambiguous since the fronted WH-phrase can be associated only with the matrix clause. The TC in (188a) promotes the unambiguous reading: the speaker is asking only 'when Alexis was hard to please' and not 'when to please Alexis'.

Example (188) thus suggests then that the infinitival phrase in the TC may be a complement.

To summarize, the complement analysis of the *tough* infinitival phrase can be argued for based on the following facts: the capacity for reformulation into the extraposition construction, its inability to stack, its capacity for conjoining with other complements, the presence of an obligatory missing object, and the ambiguity suggested by extracted adjuncts.

4.5.3 Arguments for the adjunct account

The first argument for the adjunct account pertains to the *tough* adjective + nominal construction. As we have seen, Chomsky (1977) points out that the TC resembles the *tough* adjective + nominal construction, illustrated in (189).

- (189) a John is an easy man to please.
 b That is a difficult topic to write about.

Wilder (1991) extrapolates the grammatical function of the *tough* infinitival phrase based on these similarities and argues that the phrase in both constructions is necessarily an adjunct since complements to adjectives appearing in postnominal positions would be separated from their heads, an impossibility, as illustrated in (190).

- (190) a * He is an eager man to succeed.
 b He is a man eager to succeed.

In (190), the infinitive *to succeed* is the complement to the adjective *eager* and as such, the former should immediately follow the latter. When it does not,

as in (190a), the result is ungrammatical, and vice versa. Now compare (190) with (191):

- (191) a He is an easy man to please.
 b * He is a man easy to please.

Wilder's analysis would claim that example (191) shows that in the *tough* adjective + nominal construction, the *tough* adjective *easy* should be separated from its infinitival phrase *to please*. So the infinitive in the construction could be argued to be an adjunct.

Wilder's analysis, however, is faulty with respect to two points. One point pertains to the case when a *tough* adjective + infinitival phrase is used as a complement to an object. See (192).

- (192) a I regard Mary as eager to succeed.
 b I regard Mary as easy to please.

Example (192b) shows that the *tough* infinitival phrase, like an object complement (as in (192a)), may compose a constituent and is hence different from the case when it is used as a subject complement (as in (191b)).

The second point pertains to the absence of *tough* nominalizations, as shown by (193).

- (193) a * John's easiness to please
 b John's eagerness to succeed

Proponents of the adjunct analysis such as Wilder assert that this absence distinguishes the *tough* infinitival phrase from a canonical infinitive complement. On the contrary, the absence of *tough* nominalizations has nothing to do with the

status of the *tough* infinitival phrase as either adjunct or complement. In fact, it is due to the simple fact that there is no noun form of 'easy' available.

- (194) a * John's hardness to please
 b * John's difficulty to talk to

The second argument for the adjunct analysis is founded on the claim that a *tough* infinitival phrase is optional (Jones 1991, Wilder 1991). The *tough* adjective and the matrix subject can stand alone without the accompaniment of an embedded infinitive.

- (195) a The exam is hard to take.
 b The exam is hard.

As the adjunct argument goes, example (195) indicates that the *tough* infinitive is an adjunct since it, like an adjunct, is optional and does not need to be present to make the sentence acceptable.

This argument, however, is not convincing since the omission of the infinitive sometimes makes sentences unacceptable. For example, when the *tough* subject is a clause, the infinitive normally cannot be omitted. See examples (196) and (197).

- (196) a That this should be so is hard to fathom.
 b * That this should be so is hard.
- (197) a Why Justin dropped out is hard to comprehend.
 b * Why Justin dropped out is hard.

Hence, infinitive omissibility, as an argument in support of an adjunct analysis of the *tough* infinitival phrase, does not hold.

Besides, omissibility does not necessarily have any bearing on adjuncthood. There are cases in which the presence of an adjunct is indispensable to make sentences grammatical. Manner adverbs in middle verbs, traditionally considered adjuncts, constitute one example of this. See examples (198) and (199).

- (198) a The meat cut easily.
b * The meat cut.

- (199) a The book reads easily.
b * The book reads.

The (b) sentences of examples (198) and (199) are ungrammatical without their adverbs.

Offering the third argument in support of the adjunct analysis of the *tough* infinitival phrase, Contreras (1993) asserts that the null V' anaphora after *to* is possible only with a complement and not with an adjunct. Consider example (200).

- (200) a * Tara is easy to flatter, but Amanda is hard to.
b Luke is eager to go, but Paul is reluctant to.
c * Theodore runs to stay fit, while Franklin swims to.

Because the sentences in (200) show that the TC cannot form a null V' anaphora (shown in (200a)), Contreras argues that the infinitival phrase patterns not with a complement ((200b)) but with an adjunct ((200c)). The infinitival phrase in the TC, he concludes, is thus an adjunct.

However, this claim that the null V' anaphora is not possible with the TC seems to be an overgeneralization. There may be certain *tough* predicates that allow for a null V' anaphora. See (201).

(201) ? John is pleasing to talk to but Bill is annoying to.

The null V' anaphora test thus cannot be considered a convincing argument for the adjunct account.

Jones (1991) provides the fourth argument for the adjunct account in terms of the following construction:

- (202) a John is a bitch to work for.
 b * John is the/ that bitch to work for.
 c Those guys are bitches to work for.
 d * Those guys are the/ those bitches to work for.

He observes that the N or Ns involved in the *bitch*-type construction must occur with indefinite NPs.

Jones argues that if the construction depends on the definiteness of the NP, the infinitival phrase in the postnominal position in (202) is subcategorized by the NP, not N. He continues his argument by maintaining that since the meaning of *a bitch* is similar to the meaning of the *tough* adjective *difficult*, the claim about *a bitch* can extend to *tough* adjectives. That is, he posits a parallel case from the fact that the infinitive in the *bitch* construction is subcategorized by a phrasal NP, and not by a lexical N: the infinitive in the *tough* construction is subcategorized by a phrasal AP, not by a lexical A. Since the lexical category subcategorizes only for complements, Jones concludes that the infinitive in the TC, as in the *a bitch* construction, is an adjunct.

However, it is mere coincidence that the phrase *a bitch* shares the same semantics as *difficult*. *A bitch* differs from *difficult* in syntax; unlike a regular NP, it is not referential. And as a non-referential NP, it cannot be WH-moved, unlike a canonical referential NP. Compare the regular NP *man* in (203) with *bitch* in (204).

- (203) A: What kind of man is John?
B: John is a good man to work for.
- (204) A: What kind of bitch is John?
B: * John is a good bitch to work for.

The NP *a dream* is another example of a non-referential NP. See (205).

- (205) a Mary is a dream to work for.
b * Mary and John are two dreams to work for.
c Judy is a bitch to work for.
d * Judy and Evelyn are two bitches to work for.

It is thus best to regard the phrase *a bitch* as a special single lexical noun. If it is a lexical noun, the infinitive in a postnominal position cannot, as Jones would like us to think, be regarded as an adjunct.

A fifth argument offered in support of the adjunct position contends that the *tough* infinitive behaves like the purpose infinitive, neither of which has an obligatory gap (Jones 1991). See (206).

- (206) a They went to the store to buy candy.
b John is easy to please.

Since the purpose infinitive is a canonical adjunct, the argument goes, the *tough* infinitive is also considered an adjunct.

The *tough* infinitive phrase, however, differs from purpose infinitive clauses. First, while *tough* infinitival phrases allow for the extraposition construction, it is impossible for an extraposition construction to contain a purpose infinitival phrase (Wilder 1991). Since only infinitival complements allow for the extraposition construction, the infinitive in the TC acts like a complement. Second, there is a fixed word order between a *tough* infinitive and a

purpose infinitive adjunct: the purpose clause follows a *tough* infinitive, but not vice versa (Jones 1991). Example (207) is taken from Jones.

- (207) a The test was hard to use in order to separate the smart students from the slow ones.
 b * The test was hard in order to separate the fast students from the slow ones to use.

Since a complement follows its head more closely than an adjunct, (207) shows that the *tough* infinitive cannot be considered an adjunct. Third, the *tough* infinitive cannot extract to other positions in a clause, as is common with infinitival adjuncts. Compare Jones' examples in both (208) and (209).

- (208) a The test was hard to complete.
 b * To complete, the test was hard.
 c * The test, to complete, was hard.

- (209) a The test was hard to use in order to eliminate slow students.
 b In order to eliminate slow students, the test was hard to use.
 c The test, in order to eliminate slow students, was hard to use.

Examples (208) and (209) show that extraction of the *tough* infinitive is not as free as that of the purpose infinitival adjunct. Hence, there are significant differences between purpose infinitival adjuncts and *tough* infinitives. *Tough* infinitives cannot be considered adjuncts.

4.5.4 Summary

To summarize, the following phenomena do not contribute to the claim that the *tough* infinitive is an adjunct: the similarities between the TC and the *tough* adjective + nominal construction, the optionality of a *tough* infinitive, null

V' anaphora, the dissimilarity to the *a bitch* construction and to purpose infinitive clauses.

If the above observations are true – that the *tough* infinitive straddles the boundary between complementhood and adjuncthood – the characterization of the infinitival phrase in the TC might pose a problem for current syntactic theories in which the dichotomy between complements and adjuncts is usually strictly observed.

For example, transformational theories have long assumed that there is a clear configurational distinction between complements and adjuncts, although this distinction becomes murky in Minimalism.

Constraint-based theories make different assumptions regarding the grammatical levels responsible for the complement vs. adjunct dichotomy. LFG has assumed that complements and adjuncts should be distinguished not tree-configurally (i.e. within c-structure), but at the level of grammatical functions (i.e. within f-structure (Bresnan 1982)). It is not clear to what extent the complement vs. adjunct distinction should be represented tree-configurally, if at all, and neither is it clear what the grammatical level is at which the complement vs. adjunct distinction should be represented (if at all).

Within HPSG both approaches have been assumed, sometimes simultaneously: Pollard and Sag (1987) assume that adjuncts are sisters to heads, later reverting back to the tree-configural distinction (1994). Recent HPSG work re-examines phenomena claimed to require a configurational distinction (e.g. extraction, case assignment), re-introducing the idea that at least some adjuncts are tree-configurally indistinguishable from complements.

However, the current realization of this idea in HPSG is different than in LFG or

in early HPSG in that (some) adjuncts are assumed to be lexically added to the argument structures of heads.

Within CG, however, there is no distinction between complements and adjuncts. Adjuncts are treated in a similar way to recent HPSG analyses, in that they are added to the head's list of arguments, but unlike in HPSG, this is done constructionally at the phrase level.

Chapter 5 Constructional analysis of the *Tough* construction

In the previous chapter, I argued that the *Tough* construction displays not only mixed properties of extraction and control but also its own properties not found in extraction and control. I also contended that *tough* predicates are basically raising predicates, but in certain syntactic and lexical environments, show control properties.

Regarding the construction's *for*-NP phrase, I argued that, in general, it should be treated as a prepositional phrase but could sometimes be interpreted as a complementizer and a lower subject in special syntactic and semantic conditions. I also asserted that the *tough* infinitival phrase should be analyzed as a gapped VP complement, distinct from both a canonical complement and an adjunct.

Finally, I argued that all the characterizations of the *Tough* construction cannot be explained in terms of semantics or syntax only, but rather are due to a complex interplay of syntax, semantics, lexicon and pragmatics.

In this chapter, I will show how these characterizations of the *Tough* construction, together with some detailed constraints, can fit into the CG framework in which there is no assumed clear distinction between grammatical components.

5.1 Preliminaries

In offering my analysis of the *Tough* construction, I must first sort out what kinds of constituents occur in the construction as well as the ambiguities

associated with it, what grammatical functions the *tough* predicate licenses, what constructional or lexical constraints there are in its optional or obligatory complements, and how these constraints are expressed in CG vocabulary. I will then consider what other constructions the *Tough* construction interacts with. Following this consideration, I will discuss whether my treatment of the construction produces the correct constituent structure for *tough* sentences.

I will also discuss the different semantic senses and valence structures that a given *tough* predicate generates, how those variants are related to each other, and how those relationships are captured in CG.

Even though I will show the number of *tough* lexical constructions that can be instantiated by an examination of a single *tough* predicate *easy*, this does not mean that other *tough* predicates would necessarily have the same number of different semantic senses and valence possibilities. Each *tough* predicate comprises different semantic content, and possibly different valence structures as well.

Before proceeding, note that I will cover the valence possibilities of the only *Tough* construction. I am not concerned with the full description of alternative valence representations of adjectives and nouns of the *tough*-type predicate. In other words, I will mostly restrict my attention to the valence variants of the *Tough* construction, giving only slight attention to the valence alternatives displayed in interaction with the extraposition construction when they are relevant.

5.2 Constituent structure of the *Tough* construction

First of all, it should be noted that a *tough* sentence is not licensed by any constructions particular to the *Tough* construction; all constituents of its constituent structure come from already available constructions that have been built around *tough* adjectives.

Let us now see how the constituent structure of a *tough* sentence like (1) is licensed.

(1) John is easy to please.

In (1), the verb *please* is licensed by a single VP construction that does not require any complements. The phrase *to please* is licensed by the XH construction since *to* is a marker and *please* is a bare-stem verb phrasal head. The noun phrase *John* is licensed by an NP construction.¹

The adjective phrase *easy to please* is licensed by an HC construction in which a head is followed by its complement. The *tough* adjective *easy* is the head of the AP construction, a variant of the HC construction, and the marked infinitive *to please* is a complement of *easy*. While the HC construction basically licenses any number of complements, the AP construction allows a maximum of two complements. See example (2).

(2) John is easy for me to please.

¹ As I mentioned in section 2.9.2, a proper noun such as *John* is treated simultaneously as N, N', and NP in transformational grammar, but only as NP in CG.

In the case of the *tough* adjective *easy* in example (2), the two complements allowed by the AP construction are the *for*-NP phrase, *for me*, and the marked infinitive *to please*.

It is worthwhile to point out that differences in the properties of the corresponding constructs that are licensed by constructions are more likely to be attributable either to limitations on the minimal valences of adjectives or to special features of their complements, rather than to the particular variant of the HC construction in question. For example, the marked infinitive complement of a *tough* adjective may have properties that differentiate it from the PP complement of adjectives like *fond*.

The verb phrase *is easy to please* is licensed by the HC construction, also. The head *is* takes the non-verbal complement *easy to please*. Note here, in passing, that *easy* itself cannot directly instantiate its subject constituent. In other words, *easy* needs the help of a co-instantiating verb, such as a raising verb, to co-instantiate its subject argument. As in other grammatical theories, CG assumes that the copula *be* is a raising verb.² So the subject of the non-verbal predicate *easy to please* is co-instantiated with the subject of *be*. In other words, the subject interpretation of the complement, *easy to please*, is borrowed from its head verb, *be*.

Finally, the sentence *John is easy to please* is licensed by the SP construction, in which the subject *John* is followed by its verbal head, *is easy to please*.

Note that even though I have shown the licensing of the *tough* sentence by a bottom-up procedure for ease of understanding, the licensing process should

² In CG, copulas and auxiliaries are treated as subject-raising verbs. They are assumed to be main verbs that take VPs as their complements. In other words, the complement is a verb phrase headed by a verb whose inflectional forms are determined by auxiliaries, modals, and copulas.

not be interpreted as procedural; whatever linear order it takes should produce the same correct constituent structure.

5.3 Ambiguities of the *Tough* construction

Let us start our discussion by reminding ourselves that the following sentences have two different interpretations – what I call the 'thetic reading' and the 'categorical reading' (cf. Chapter 4.2).

- (3) John is easy for me to please.
 a 'It is easy for me to please John.'
 b 'There is something about John that makes it easy for me to please him.'
- (4) No one dreamed the Titanic would be so easy for an iceberg to sink.
 a 'No one dreamed that it would be so easy for an iceberg to sink the Titanic.'
 b 'No one dreamed that due to its inherent robustness, the Titanic would likely be easy to sink with an iceberg.'

A sentence like (3) can be interpreted along the lines of either (3a) or (3b). The interpretation in (3b) differs from that in (3a) in that the *tough* subject plays a certain semantic role – which I call 'reason' – with respect to the *easy* predicate. That is, while (3a) merely expresses that some eventuality – 'me pleasing John' – is *easy*, (3b) additionally says that it is because of some property, or characteristic, of the *tough* subject that the eventuality is *easy*. When sentences like (3) are heard, the addressee usually interprets it in the sense of (3b). This may be due to the fact that the sense of *easy* in (3b) may have a higher 'degree of activation' – a concept coined by Langacker – than that in (3a).

A similar account can be described in (4a) and (4b), except that in (4) there is no experiencer, and the *for*-phrase is interpreted as the subject of an embedded infinitival phrase.

Examples (3) and (4) show that it is not necessary that every syntactic form be uniquely associated with a particular semantic sense; there are cases of constructional ambiguity, where distinct meanings are assigned to the same form. A complete characterization of the *Tough* construction must be based on multiple parameters at different levels of representation. These include the distinction betweenthetic and categorical judgments as shown in (3) and (4).

The ambiguity of (3) and (4) betweenthetic and categorical readings can be accounted for by assigning different constructions with different meanings to the constituents. This is because words can have multiple senses, and different senses might have different valences.

5.4 Four lexical constructions of *easy*

In this section, I present the four lexical constructions each of which illustrate the four interpretations shown in examples (3) - (4).

5.4.1 The first construction

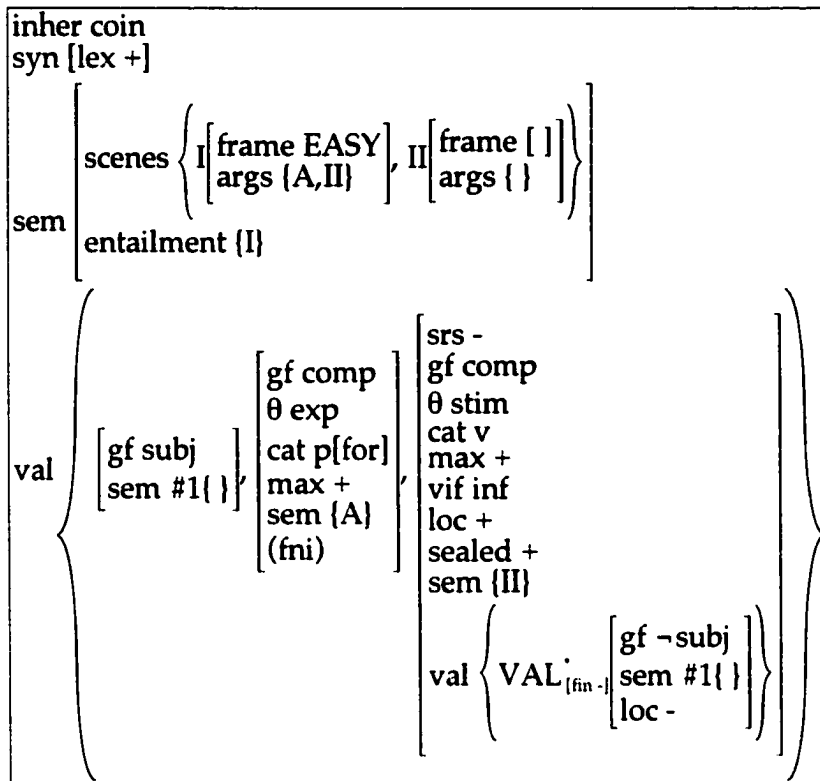


Figure 1.

Figure 1 represents the first *easy* lexical construction that can be used in licensing the construct *John is easy for me to please*, the meaning of which corresponds to (3a).

Figure 1 shows that the *easy* predicate in (3a) is syntactically a three-place predicate. It takes a subject and two complement constituents. Semantically, however, it is a two-place predicate. I take the two arguments to be an experiencer argument and a stimulus argument. The experiencer argument is expressed as a *for*-NP phrase, and the stimulus argument is expressed as a marked infinitival phrase. So Figure 1 represents a construction that displays discontinuity in the instantiation of valence elements – a mismatch between syntactic valences and semantic arguments. That is, a semantic argument 'stimulus' is instantiated in the

form of two separate constituents: a *tough* subject and a non-finite VP, while a semantic argument 'experiencer' is in the form of a single constituent: the *for*-phrase.

By 'experiencer', I refer roughly to a sentient being that is the locus of a mental state. By 'stimulus', I mean some eventuality or entity which is instrumental in bringing about a psychological change of state in a sentient being.

Semantically, the *Tough* construction describes a situation in which an animate entity (= the experiencer) goes through an experience of an event (activity or state) (= stimulus) and makes a judgment of that experience relative to himself. The judgment can address emotion (e.g. *pleasant*), value (e.g. *good*), effort (e.g. *easy*), and so on (cf. Berman 1974).

5.4.1.1 The details of the first construction

We are now in a position to discuss the properties mentioned in the diagram in a more detailed way.

In Figure 1, the top line says that the *easy* lexical construction inherits the Coinstantiation construction.³ Since the *easy* lexical construction contains all the information of the Coinstantiation construction, this means that the unexpressed subject of a non-finite lower predicate necessarily refers to an argument in a higher predicate. In other words, by specifying the feature [inher coin], the *Tough* construction will call on the independently existing Coinstantiation construction for on-line unification.

³ For further information on the Coinstantiation construction, see Chapter 5.7.3.

Then, the question arises: which argument in the valence of a governing predicator coinstantiates which argument in the valence of a complement predicator? In Figure 1, the experiencer controls the subject of the stimulus proposition. In other words, the Coinstantiation construction must unify the experiencer argument with the subject requirement of the *tough* infinitive. The fact that the unexpressed subject of the *tough* infinitive refers to the *for*-NP phrase, not to the *tough* subject, is guaranteed by the semantic structure of the *tough* predicate to which I will return below. That is why the feature 'coin' does not need to specify its value.

The next line in Figure 1, *syn* [*lex +*], encodes the fact that the *Tough* construction unifies with a lexical item that has the semantic and valence information described below.⁴

The semantic structure of Figure 1 encodes the semantic content of (3a) in terms of scenes and entailments. Scenes include a set of predications (= a set of frames). Each predication consists of a frame (relation) and a set of arguments. The semantic values sometimes specify the valence feature to which each individual semantic content corresponds. In Figure 1, the scenes value is a set which comprises two members, indexed I and II.

Consider the case of *John is easy for me to please*. In the sense of 'It is easy for me to please John', scene I corresponds to 'me pleasing John is easy for me', and scene II corresponds to 'my pleasing John'.

⁴ For ease of representation, I encode only the relevant part of path expressions. For example, '*syn* [*+lex*]' means '*synsem* | *intrinsic* | *syn* | *level* | *lex+*'.

this ordering is accounted for by separate ordering constructions in such a way that linear precedence is achieved.

I also assume, for argument's sake, that a grammatical function licensed by *tough* predicates is assigned its given theta role lexically rather than by general linking principles.

The structure shows that the predicate has three valence elements. The first element encodes the *tough* subject. It is perhaps true that all types of phrases may appear as subjects. Thus, by not specifying syntactic information such as category, I suggest that the selection of subject phrases in the *Tough* construction should not be constrained by a syntactic category. An example of any syntactic category can fill the subject slot as long as its semantic content is compatible with the valence element of some embedded downstairs predicate.

This selectional restriction between the *tough* subject and its 'missing' argument is captured by semantic compatibility, which is marked by the same index number, #1, between them. Since only semantic compatibility is required between the *tough* subject and its 'missing' argument, a syntactic problem such as category mismatch does not arise.

Since I assume that the *tough* subject of Figure 1 cannot be an argument of the *tough* adjective, it does not correspond to any scene of the semantic structure.

The second and the third valence elements represent the two oblique complements, indicated as [gf comp], that *tough* predicates take. I will distinguish these oblique constituents by referring to their syntactic categories and subcategories, which are described below.

The second valence element encodes the sentient being that undergoes the experience of the eventuality structure denoted by the infinitival phrase. Hence its

thematic role is that of an experiencer. The experiencer role imposes constraints on the kind of notional object which may bear the experiencer role to the main *tough* predicate. One distinctive limitation is that experiencers must be animate. This is a kind of selection restriction as there is a semantic relation between a predicating word and its argument.

The experiencer often occurs with predicates that represent experience. These predicates usually describe an act or experience, and a sentient being who undergoes the act or experience. The oblique expressions are realized by a PP headed by either *for* or *to*. As Fillmore and Kay (1995) observe, the selection of either preposition over the other seems to bring about some observed semantic difference. For example, in the case of *to*, what is under emphasis is the experiencer's judgment. In the case of *for*, on the other hand, what is emphasized is the experiencer's involvement in the experience. Consider (7) and (8).

- (7) a To me the lecture was interesting.
b The house seems big to me.
- (8) a For me that kind of activity is impossible.
b Math is not easy for me.

Some predicates allow both the *to*- and *for*-phrase for an experiencer. *Tough* predicates, however, allow only *for* as the head of the experiencer phrase (Berman 1974). See (9) - (11).⁵

- (9) a Fresh air is beneficial for/*to patients to breathe.
b It is beneficial for/to patients to breathe fresh air.

⁵ Some speakers, however, do not permit *to* as the head of the experiencer phrase in the extraposition construction, either. For them, (9b), (10b), and (11b) with the *to*-phrase are ungrammatical.

- (10) a An outline was instructive *for* / *to students to write.
 b It was instructive *for* / to students to write an outline.
- (11) a Jumper cables are necessary *for* / *to drivers to have.
 b It is necessary *for* / to drivers to have jumper cables.

Examples (9) - (11) show that adjectives such as *beneficial*, *instructive*, or *necessary* permit the *to*-phrase as well as the *for*-phrase as an oblique complement in the extraposition construction but allow only the *for*-phrase in the *Tough* construction.

The experiencer is syntactically realized as a prepositional phrase whose head is the preposition *for* ([cat p [for], max +]). Even though the experiencer role is involved in the interpretation of the *easy* conceptual structure, its syntactic realization in the form of PP is not mandatory. Whether or not the *for*-phrase is omitted depends upon the specific *easy* lexical item.

When the PP is not manifested, this missing constituent is interpreted freely since there is no contextual clue for direct interpretation. Depending on the discourse situation, the missing constituent can refer to people in general, or to a conversant, or to someone whose point of view is being adopted in a sentence. In other words, when an oblique *for*-phrase does not appear, free null interpretation is imposed. This fact is indicated by the notation [(fni)].

The *for*-NP not only acts as the experiencer of the *easy* eventuality, but also, due to the inheritance of the Coinstantiation construction, controls the subject of the stimulus argument that is expressed by a non-finite infinitive. The synsem properties of the experiencer argument of *easy* unify with those of the subject of *please*. In other words, the experiencer and the subject of the stimulus argument always co-refer. This accounts for the fact that the *Tough* construction does not allow a double occurrence of the *for*-phrase, as in (12).

- (12) a * The hard work is pleasant for the rich for the poor to do. (Chomsky 1977)
 b * Washing the dishes is fun for the kids for Mom to do. (Kay, p.c.)

When the *for*-phrase is absent, the subject of the stimulus argument is pragmatically interpreted.

The third valence element contains the syntactic, semantic and valence information of the stimulus eventuality structure. It takes the form of an infinitive preceded by the obligatory marker *to* ([cat v, max +, vif inf]). *To* has a marking function without promoting any semantic interpretation and is followed by a bare-stem verb phrase; other types of complements are not allowed. See (13).

- (13) a * John is easy talking to.⁶
 b * The hard work is pleasant that the rich should do.

Example (13) shows that the *Tough* construction does not allow, for example, either a gerundial or a finite clause as its complement.

The subject of an infinitive is always locally suppressed. By marking the infinitive [srs-], I stipulate that the infinitive is a predicative complement, and the Coinstantiation construction has to be summoned; the subject of the *tough* infinitive has to be co-construed as one of the arguments in the higher predicate.

⁶ Incidentally, this contrasts with the following grammatical sentence:

- (i) It is easy talking to John.

Example (i) looks like extraposition but is better classified as right dislocation. Generally, there are some cases with gerundial clauses or VPs that look like extraposition, but are presumably better classified as right dislocation. I intend not to give a comprehensive review of the distinction, but to provide just enough information to be able to make a distinction between right dislocation and extraposition. According to Kay (1996), the right dislocation structure has the following characteristics: (1) the *it* and the final clause are truly coreferential; (2) a comma occurs before the final clause, which indicates a pause, and the following clausal part is most naturally pronounced with a low-level tone; and (3) the final clauses usually contain anaphoric elements.

In other words, a predication relation holds between the [srs -] constituent and whatever instantiates the [gf subj] argument of its head.

The argument that controls the subject of the *tough* infinitive is the experiencer, not the syntactic object of PP. That is, the subject requirement of the *tough* infinitive is either controlled by the experiencer argument regardless of the syntactic object of the PP expressed in an oblique *for*-phrase, or is left unexpressed and freely interpreted.

The subject of the infinitive does not have to be encoded since this information is provided by the Coinstantiation construction. For this reason, the top line mentions 'coin'.⁷ The other components of grammar, especially semantics or pragmatics, will provide the exact controller. The controller of an upstairs argument is selected semantically while the controllee is determined by the grammatical function subject. That is, the Coinstantiation construction will be inherited by the *Tough* construction to express the control of the subject of the stimulus proposition by the experiencer.

Even though the constituency structure is regulated by an independent construction, the marking of 'comp' as the grammatical function of the infinitive together with the indication [loc +] guarantee that the infinitive is realized within the AP.

The infinitive constituent is an island since a constituent distinct from the *tough* subject cannot be 'extracted' from the infinitive. This restriction is indicated by [sealed +].

⁷ Technically speaking, I do not really need to stipulate inheritance of 'coin' – e.g., in Figure 1 – in the lexical constructions. If I do not, it will simply have to be unified with them on line to prevent crashing. But I mention this in order to show how the interpretation of the *tough* subject is made.

The semantics of the complement corresponds to the stimulus eventuality. That is why the semantic value is II. There are no constraints on the semantics of the complement.

As a predicate, the *tough* infinitival phrase can have its own valence set, which likewise can also have its own valence set, and so on. In the last valence set of a valence structure series, there is a missing argument which can be construed from the *tough* subject. That is, the semantic relationship between the *tough* subject and the embedded missing argument is captured by valence embedding. This concept is represented by the feature VAL. An asterisk attached to the feature represents a possibly infinite reiteration of valence embedding, including zero instantiation, and thus represents a possible long-distance relationship between the *tough* subject and the missing argument.

Note that the *Tough* construction needs an independent means to encode long-distance dependency. For example, the *Tough* construction cannot inherit the Left Isolate construction: there is nothing in the *Tough* construction to fill the left daughter of an Left Isolate structure. In other words, the *Tough* construction does not share the constituent structure of the Left Isolate construction, but does share its property of long-distance dependency. I will discuss this commonality below.

Note also that the distantly instantiated valence is not due to a chain of coinstantiation links, as in control or raising verbs, but rather is linked by instantiation only to the object valence element of the most embedded verb. When embedding is recursive, involving a series of verbal structures, for most speakers, the intervening structures do not have to be infinitival as long as they are non-finite. This constraint is encoded by [fin -], which every intervening predicator has on its valence structure, and is appended to the 'VAL' feature in the diagram.

Note that there are some speakers who do not require this constraint; that is, for them, the coindexation of the *tough* subject with the *tough* gap may be made across a finite clause boundary introduced by an intervening predicator.

The 'missing' argument is, of course, by definition, not phonetically realized in the infinitival phrase. This fact is encoded by [loc -]. Since the valent is not locally realized, its semantic content is construed from the *tough* subject. In other words, the *tough* subject and the 'missing' argument share the same index number ([SEM #1]).

The 'missing' argument that ends up unifying with the *tough* subject is a non-subject argument of whatever embedded predicator (= a verb or preposition) – whether or not it is a predicator of the *tough* infinitival phrase – it is an argument of. Note that I do not say that the 'missing' argument is not a subject but that it is a non-subject. This distinction arises, for example, in control cases in which a 'missing' argument is both a subject and an object of different embedded predicators. See (14).

(14) John might be hard to persuade to become the class president.

In (14), *John* coinstantiates the object of *persuade* and the subject of *become*, the latter two valence elements being linked by control. Thus in (14), the *tough* subject, *John*, instantiates a subject. However, it is not the case that *John* fails to instantiate a non-subject; *John* also instantiates the object requirement of *persuade*. Therefore, the sentence is grammatical. A non-subject of any embedded predicator may occur as the *tough* subject. This fact is encoded by [gf ¬subj].

5.4.2 The second construction

Figure 2 presents a full description of the semantic interpretation of (3b).

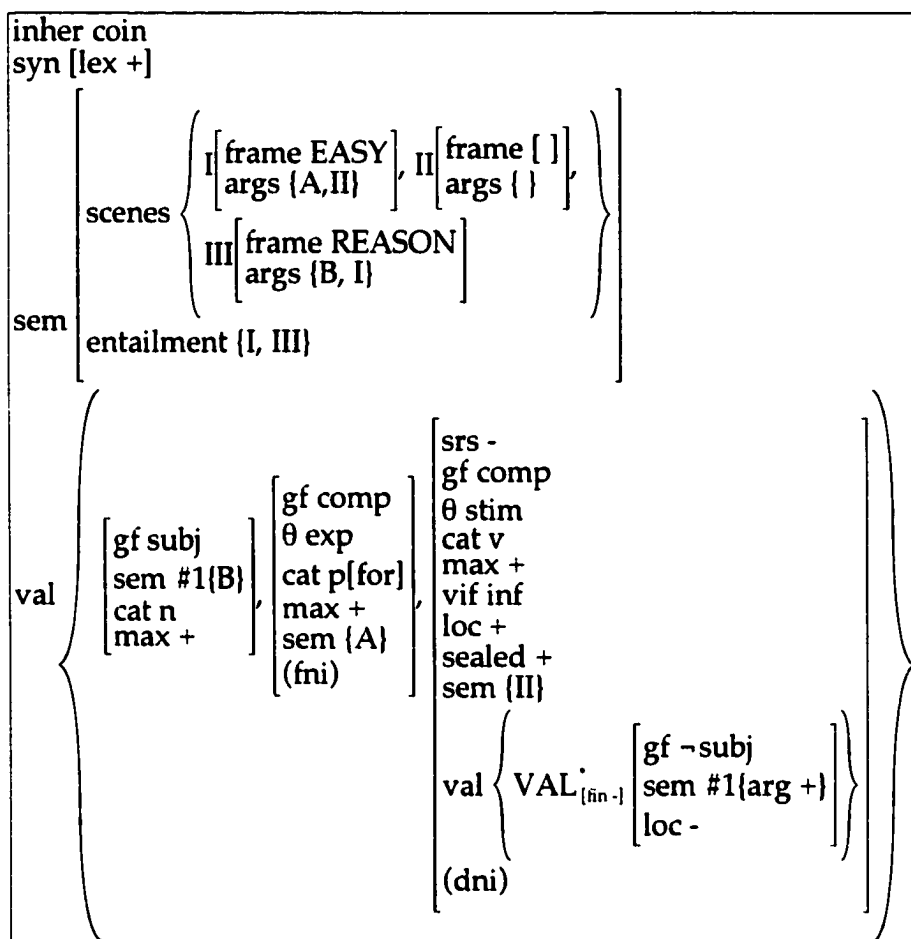


Figure 2.

The key differences between Figures 1 and 2 are the addition of a scene, III, in the semantic structure, and the resultant semantic encoding on its valents. Scene III contributes the additional meaning parochial to (3b), and consists of two arguments: an entity B and the EASY predication I. It signifies that the judgment

of the EASY eventuality results from the reason of the entity. That is, B, a *tough* subject, is the locus of reason for I. Hence, regarding the semantics of Figure 2, I am saying that 'EASY' (a judgment of ease) is asserted to hold between the experiencer (A) and the stimulus eventuality (II), and I am separately asserting that (something about) the *tough* subject, B, provides a reason that the EASY predication, I, holds.

For example, the speaker of (3b) (= John is easy for me to please. 'There is something about John that makes it easy for me to please him.') takes *being easy for me to please* to have a reason, and he predicates this reason to be something about *John*. Hence, the 'REASON' eventuality, represented in scene III, is an additional entailment of Figure 2. So the entailment value would be {I, III}, which would be saying, more explicitly, that some contextually recoverable characteristic (or property) of the *tough* subject's referent provides a reason that the EASY predication I holds.

In order to understand what I mean by the notation 'REASON', see (15).

- (15) a * The Titanic is impossible for this iceberg to sink, but it has nothing to do with the Titanic.
 b * The newspaper is difficult for me to read, but it has nothing to do with the newspaper.

Example (15) is ungrammatical because the second clause denies the necessary relevance of the reason of the *tough* subject in the first clause.

This new inherent characteristic of the *tough* subject with respect to the *tough* predicates is accompanied by additional conditions, both syntactic and semantic. One condition, which is syntactic, is that the *tough* subject should be an NP. This fact is encoded by [cat n, max +]. The other condition, which is semantic,

is that the object of the embedded predicator must bear a theta-relation to the frame evoked by the embedded predicator. This restriction is indicated by [arg +] in the value of the 'missing' element position in the embedded infinitival phrase.

The claim that the *tough* subject must be an argument is confirmed by the fact that the *tough* subject position cannot be occupied by non-argument objects, which include raised objects, a certain type of idiom chunk objects, expletive objects, and objects of case-marking prepositions. The following is a discussion of each of these.

First, a raised object cannot be a *tough* subject while a control object can.

Consider (16).

- (16) a John was hard for us to persuade to marry Leslie.
 b * John was hard for us to expect to marry Leslie.

The difference in grammaticality in (16) seems to be related to the fact that *tough* gaps can occur in the complements of 'control' verbs such as *persuade* but not in those of 'raising-to-object' verbs such as *expect*. It seems necessary, then, to distinguish between the kinds of verbs from which an NP is *tough*-'moved': 'raising-to-object' verbs vs. 'object-control' verbs.

In the case of 'raising-to-object' verbs such as *expect*, the valence members do not play any thematic role in the governing predicator, as opposed to the case of 'object-control' verbs such as *persuade*, where the valence members do play a thematic role. Given that the distinction between raising and control depends on

whether or not the controller's semantic role is empty, the *tough* subject position must be occupied by a thematic argument.⁸

Second, a certain type of idiom chunk objects cannot be a *tough* subject while another type can. Even though idioms show a wide range of degrees of syntactic variability and semantic combination, for the present purpose, I assume that there are just two types of idiom chunk objects. One of these has less referential meanings than the other. It seems that the more readily an idiom chunk object accepts an referential construal, the more acceptable it is as the subject element in the *Tough* construction. For example, in the case of the idiom *keep tabs on*, the NP *tabs* is part of the frame evoked by *keep* but also has a referential function. See (17).

(17) *Tabs are easy to keep on employees' long-distance calls.*

Other instances of this kind of idiom follow:

(18) a *The music is hard to face when your reputation is on the line.*
 b *A good impression is hard to make in a formal reception when you dress very casually.*

On the other hand, in the case of the idiom, *pay heed to*, *heed* is part of the frame evoked by *pay*, and hence is semantic, but cannot act as an argument of *pay*.

(19) * *Heed is difficult to pay to boring lectures.*

⁸ However, even with raising verbs, given more appropriate contextual information, the sentence becomes acceptable. See (i).

(i) *Mary might be hard to imagine anyone talking to about the abortion issue since she is so conservative.*

Example (i) shows that complex aspects of lexicon and pragmatics interplay to determine a grammatical judgment.

Example (19) shows that an idiom chunk object may be semantic but not necessarily an argument.

There are other VP idioms which do not allow their objects to appear as *tough* subjects.

- (20) a * Unfair advantage was easy for Bill to take of his employees.
b * Careful attention is difficult to pay to boring lectures.

Examples (17) and (20) show that the capacity of an idiom chunk object to be an argument depends on the individual idiom.

Third, an expletive object cannot be a *tough* subject.

- (21) a * It is easy for us to expect to snow in New England even in early March.
b * There was easy for us to believe to be no alternative.
c * It would be difficult for a scientist to cause to be unmistakable that there is no God.

Example (21) is ungrammatical since the expletives, *it* or *there*, are *tough*-'moved' from their non-subject position of the embedded clause, after *expect*, *believe*, or *cause*, respectively, in (21a), (21b) or (21c) to the *tough* subject position of the matrix clause.⁹

Fourth, although an object of a case-marking preposition cannot be a *tough* subject, an object of an argument-taking preposition can, as in (22).

- (22) a Congressmen are easy to talk to about marijuana legalization.
b * John is difficult to be relied on.

⁹ Examples (21a) and (21b) are already objectionable since the expletive in the *tough* subject is a raised, not a control object.

Following Gazdar et al. (1985), I assume that there are two types of prepositions: a case-marking preposition and an argument-taking preposition. While a case-marking preposition does not contribute any semantic content to the following NP, an argument-taking preposition does. Consider (23).

- (23) a They may talk to the congressmen about marijuana legalization.
 b We can rely on John.

While *to* in *talk to* in (23a) contributes a specific semantic meaning to *talk*, *on* in *rely on* in (23b) does not. Therefore, the prepositions which mark cases need not necessarily be thought of as semantic. In other words, the NP that satisfies the object requirement of a preposition like *on* satisfies the thematic requirement of the verb *rely*, but not of the preposition *on*. Note that the issue of whether the preposition *on* in *rely on* contributes to the frame semantics is separate. That is, it does not matter whether *on* is thought of as semantically empty or as contributing to the *rely* frame. What matters is rather that the semantics of the NP object of *on* be incorporated properly as a participant in the *rely* frame. In *rely on John*, *John* bears a grammatical function, but no theta-relation to *on* and a theta- but no grammatical- relation to *rely*. This contrasts with a VP like *talk to*. In *talk to John*, *John* bears a grammatical function and theta-relation to *to* as well. This difference is relevant to the *Tough* construction, as in (22).

All of the above four pieces of evidence show that the *tough* subject position cannot be occupied by a non-argument, a constraint recorded by [arg +].

Why can non-arguments not be the *tough* subject? I speculate that non-arguments cannot be topicalized.

Consider the topicalization construction in (24).

- (24) a * Careful attention, John paid to boring lectures.
 b * It, we expected to become sunny by this afternoon.
 c * There, they believed to be an inspection service last night.

The examples in (24) are ungrammatical because the topicalized fronted element cannot simultaneously lack thematic content and act as an argument in the topicalization construction.

Likewise, the examples in (16b), (19), (20), (21), and (22b) are ungrammatical because the *tough*-moved element occupies the topic position in the *Tough* construction.¹⁰

The topichood of the *tough* subject might also account for why the *tough* subject should not be an indefinite NP. Consider (25).

- (25) * A man is easy to please.

Example (25) indicates that an indefinite NP, *a man*, cannot occupy the *tough* subject position. This may be because the speaker cannot communicate to an addressee one's ease with some event unless the speaker assumes that the addressee has prior knowledge of that event. Notice that when the addressee hears (25), he cannot identify who *a man* is that the speaker is in mind. In other words, the *tough* subject may serve as a topic that supplies the already established linguistic context for the addressee.

¹⁰ The difference between the topicalization construction and the *Tough* construction is that in the former, the topicalized element occupies the left-most position outside a main clause, whereas in the latter, the topicalized element occupies the left-most position inside a main clause. This may derive from the fact that the topic-introducing function of the *Tough* construction is not as strong as that of the topicalization construction.

Another difference between Figure 1 and Figure 2 is that an infinitival phrase does not necessarily have to be present in Figure 2, even though it is present in the construct in (3). Omission requires the addressee to refer to the context for its intended interpretation. Only when the interpretation is 'salient' under conditions of pragmatically given information can the infinitive be omitted. This fact is represented by the stipulation '(dni)'.

Hence, the *tough* infinitive is an optional addition to the valence of the *easy* predicate, providing additional information about the *tough* subject. There is a semantic fit between the *tough* infinitive and the host predicate *easy*; the semantic content carried by the infinitive should fit in the conceptual structure of the host semantic frame. Thus I imply that *easy* has different senses in the following examples, and that the potential for omission is strongly tied to the individuated senses of an individual word:

- (26) a This book is easy.
b Mary is easy.

Example (26a) can mean, for example, 'this book is easy to read', whereas (26b) cannot mean, under a default context, for example, 'Mary is easy to talk to' but only imply a sexual connotation. Note that the potential for omission is strongly tied to the individual *easy* predicates. See (27).

- (27) a Mary was pleasant.
b * Mary is hard.

Example (27) shows that an *easy* predicate *pleasant* allows the *tough* infinitive to be omitted but *hard* does not when the *tough* subject is animate. Note also that

omission potential also depends on syntax. For example, when the *tough* subject is a clause, the infinitive cannot be omitted.

- (28) a * That this should be so is hard.
b * Why John did this is hard.

5.4.3 The third and the fourth constructions

Figures 3 and 4 describe syntactic, semantic, and valence information that licenses constructs like (4a) and (4b), respectively.

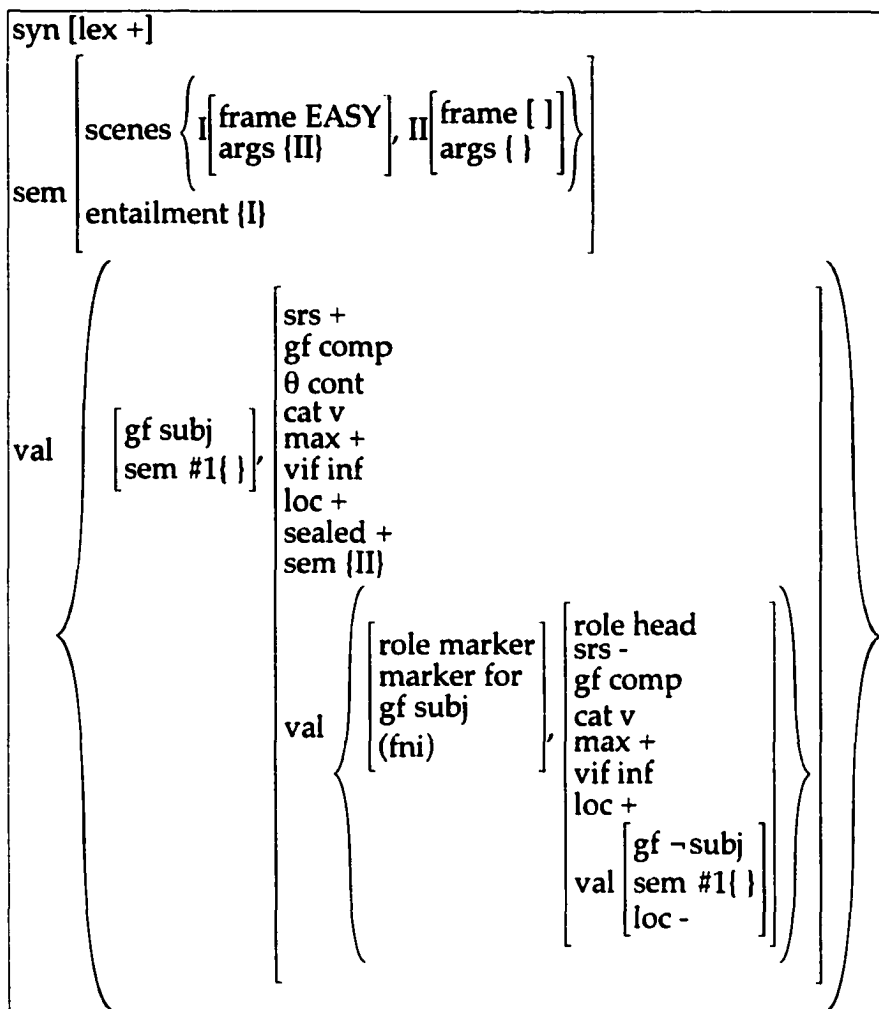


Figure 3.

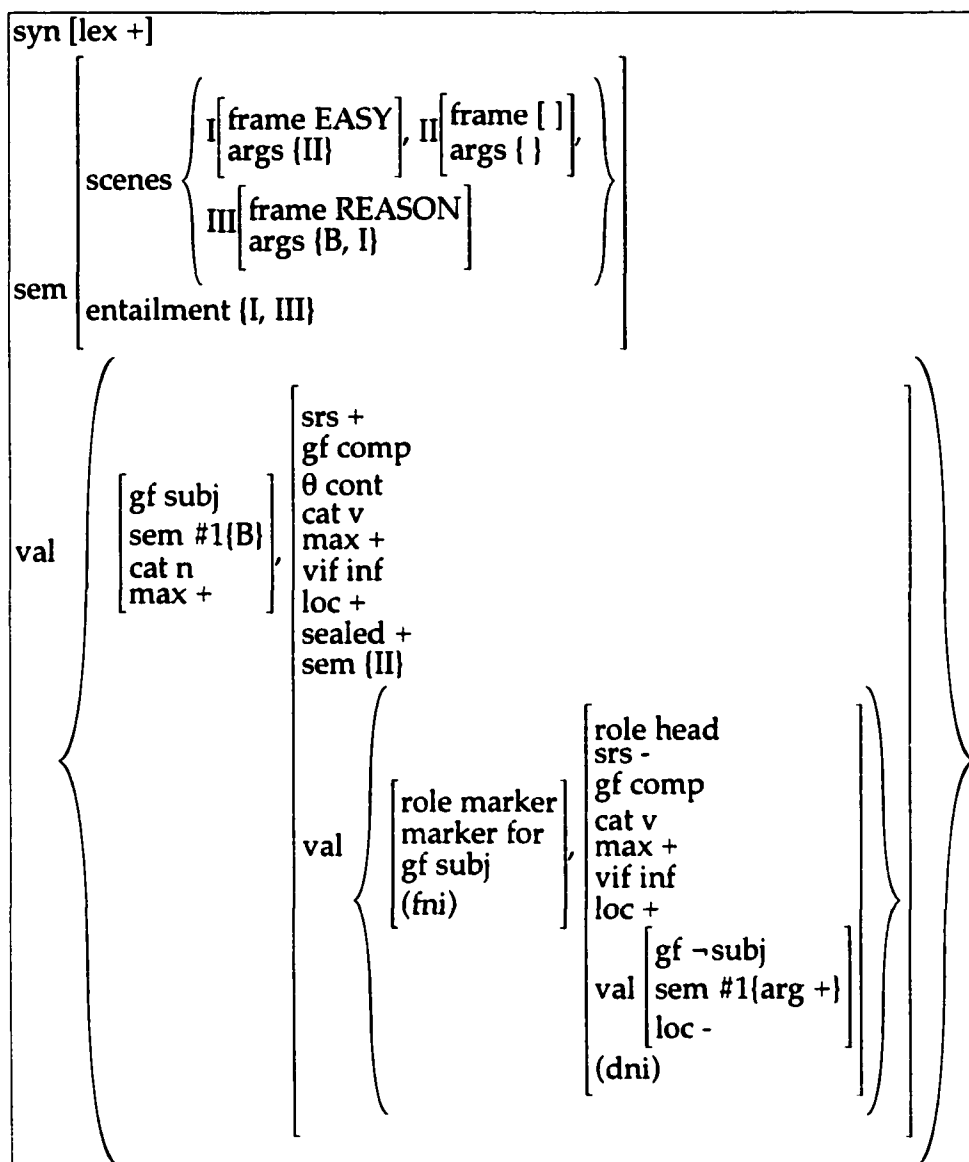


Figure 4.

Figures 3 and 4 show that the *easy* predicate in (4) is syntactically a two-place predicate; it takes a subject and a complement. Semantically, however, it is a one-place predicate. I take the argument to be a content argument. The content argument is expressed as the marked infinitival phrase. By 'content', I refer both

to the substance of a psychological state or experience but also to the propositional substance.

As with the difference between Figures 1 and 2, the difference between Figures 3 and 4 lies in whether or not the *tough* subject has a semantic role with respect to the *tough* predicate. The *tough* subject does not have a semantic role 'REASON' in Figure 3 but does in Figure 4.

There are two main differences between Figures 1-2 and Figures 3-4. First, in Figures 3-4, the *for*-NP is the complementizer + lower subject, not the matrix PP. In (4), the *for*-NP phrase cannot move around in the sentence and is not a constituent. It is not a sentient argument, either. This information is encoded as [srs +] and [marker *for*]. Since the infinitival phrase is no longer a VP, it does not call on the Coinstantiation construction. This is why no inheritance information is mentioned in Figures 3 and 4. Second, in Figures 3-4, there is no infinitive valence embedding. *Tough* sentences such as (4) do not allow long-distance dependencies. See (29).

- (29) * No one dreamed the Titanic would be so easy for an iceberg to seem to sink.

So far, I have justified the postulations of four different *easy* lexical constructions. However, this does not imply that every *tough* adjective has the same number of lexical variants as *easy* itself. Since each *tough* adjective has its unique semantics, I assume that semantic and valence information could differ from one lexical item to another. This also applies to nouns that have similar meanings to *tough* adjectives. One such case is *a breeze*, which I will discuss in the next section.

5.5 The *a breeze* construction

cat n max + lex - num #1[] sem {EASY}	cat n max - lex [] num #1[] sem { } lexh a	cat n max - lex [] num #1[] sem { } lexh breeze
--	---	--

Figure 5.

Figure 5 is a box-in-box construction that is supposed to account for the way in which some uses of nouns like *breeze* can be extended with the indefinite article *a* to produce *a breeze* with the meaning of 'easy'.

Although the *a breeze* construction in Figure 5 looks like the vanilla lexical construction that we have looked at in Figures 1-4, it is not because it has two daughter constituents. This is encoded by [lex -] in the external syntax.

Moreover, the construction is more complicated than an ordinary lexical construction because each of its lexical constituents contributes meaning that goes beyond an ordinary NP construction – i.e., external meaning that cannot simply fall out from the semantics of its constituent expressions. Since the external meaning can directly fall out neither from the right head daughter nor from the left determiner daughter construction, it should be brought into the description. This is marked by 'sem {EASY}' in the external semantics. This shows that the semantics of the extended *a breeze*, for example, is different from those of the input *breeze*.

The right-hand daughter box of Figure 5 indicates that the input is a non-maximal noun, [max -, lex []]. In a specific construct, it can be either an N such as *breeze* or an N' such as *real breeze*, *total breeze*, *absolute breeze*, etc. which is acquired through unification.

The left-hand daughter box of Figure 5 indicates that the input item is the determiner *a*. As a lexical construction, the word *a* is specified with respect to 'lex', [lex +].

Note that the *a breeze*-type construction is limited to indefinite expressions.

- (30) a Judy is a/*the/*that breeze to work for.
 b Judy and Evelyn are a breeze/*breezes to work for.
 c Judy is a real breeze to work for.

Example (30) shows that the N or Ns involved in the *a breeze*-type construction must occur in indefinite NPs. This suggests that the construction depends on the indefiniteness of the NP¹¹, and that the infinitival phrase in the postnominal position in (30) is subcategorized by the NP *a breeze*, not just the N *breeze*.

Recall that the claim that an NP can subcategorize for its complement does not pose any problems for CG in which both phrasal and lexical items can take valences.

¹¹ I am not arguing here that all *a breeze*-type nouns should be indefinite. The (in)definiteness of the determiner depends on each individual *a breeze*-type noun. Even some *a breeze*-type nouns are proper, requiring no determiners. See (i), which is attributable to Paul Kay.

- (i) a John is *Devil/ the Devil to work for.
 b John is Hell/* a Hell/* the Hell to work for.

Example (ia) indicates that *a breeze*-type noun, *Devil*, requires the definite determiner, *the*. Example (ib) indicates that another *a breeze*-type noun such as *Hell* does not allow any determiner.

I will not go into detail the complete descriptions of all the *a breeze*-type constructions, but as I do with the construction in Figure 6, all the *a breeze*-type constructions will inherit a single abstract construction.

Note also that I am not arguing that NPs such as *a breeze* are vanilla NPs; they are special NPs. For example, unlike regular NPs, they cannot be referential. While regular NPs can be WH-'moved', non-referential NPs like *a breeze* cannot. Compare (31a) and (31b).

- (31) a A: What kind of woman is Judy?
 B: Judy is a good woman to work for.
 b A: * What kind of breeze is Judy?
 B: * Judy is a good breeze to work for.

Such special NPs are examples of 'NP idioms', which are adjectivally interpreted. In other words, idiomatic expressions like *a breeze* have the internal syntactic form of a noun phrase, but the external semantic behavior of an adjective. Other nouns of this sort include *a snap, a bitch, a piece of cake, a pain in the neck, a nuisance, a dream, etc.*

5.6 The *Tough* Coinstantiation construction

Although the *easy* predicate displays four different lexical constructions, and these lexical constructions differ from each other mainly in terms of semantics, it should be pointed out that they share some valence information that distinguishes themselves from other lexical constructions. The whole set of constructions, headed by *easy* predicates, each of which has different semantics and valences, inherits the single abstract construction shown in Figure 6.

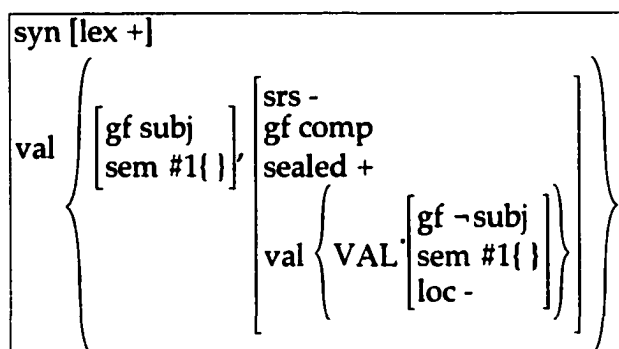


Figure 6. *Tough* Coinstantiation construction

The top line says that, like the Coinstantiation construction, the *Tough* Coinstantiation construction is licensed by a specific lexical item. The valence structure says that the predicate has two valence elements. The first element encodes the *tough* subject.

The second valence element is a subjectless infinitival complement, similar to the controlled complement in the Coinstantiation construction. The constituent is always an island, like the Left Isolate construction, indicated by [sealed +].

The second valence element has its own valence requirement. It resembles the valence requirement of the Left Isolate construction's right daughter in that it allows for multiple embedding. It differs from the right daughter of the Left Isolate construction in that only semantic information is shared with another valence element – namely, the *tough* subject. It differs from the Coinstantiation construction in that the grammatical function of the unified element must be a non-subject within the complement.

Note that in order to make the minimal valence appear as similar as possible to the general-purpose linking rule, I have omitted some details about

Figure 6. For example, I have not mentioned syntactic category since *tough* predicates, in a broad sense, may belong to any of the major syntactic categories A, N, and P. Since phrasal as well as lexical items can license a construction, I have left the 'lex' value unspecified.

I have also omitted the values by which individual *tough* predicates can differ from each other. This is true of the lexical head, category, maximality, and semantics. It is also true of certain requirements imposed on the valence: whether or not it can be unbounded, and what its semantics have to be.

5.7 Relationships with the Left Isolate construction and Coinstantiation construction

5.7.1 Preliminaries

In order to understand the properties of the *Tough* Coinstantiation construction in the larger picture of English grammar, it is appropriate to consider two other very closely related constructions: the Left Isolate construction and the Coinstantiation construction. This section is devoted to discussions of these two constructions.¹²

Before discussing each of these constructions, one preliminary note is in order: the descriptions will be fleshed out just enough to illustrate the similarities and the differences between them.

¹² This section heavily borrows ideas presented in Fillmore & Kay 1995 and Kay & Fillmore 1999.

5.7.2 The Left Isolate construction

The Left Isolate construction in CG roughly corresponds to extraction in transformational grammar and includes structures with 'fronted' constituents such as interrogatives and relatives, topicalization and other related structures. It is part of Distant Instantiation in which a valence requirement is not realized locally, i.e., as a sister or a niece to a lexical head.

The most distinctive feature of this construction is the so-called long-distance dependency. The dependency between an instantiating position and its predicator may, in principle, run across an unlimited number of clause boundaries.

However, the conception, interpretation, and possible consequences of the long-distance dependency in CG are different from those in other theoretical frameworks, particularly in PP. Briefly speaking, the long-distance dependency in CG is conceived in terms of valence relations rather than structural relations. Thus, instead of viewing the dependency between a gap position and its corresponding extracted element whose relation is linked by coindexation, the dependency is rather conceived as a relation between a constituent and a valence element which is not realized in its otherwise expected constituent structure. In other words, the dependency relation is viewed as a valence requirement which is cashed out at the left edge of a sentence, rather than as a constituent coindexed with a trace.¹³

¹³ One of the advantages of this conception is that it facilitates treating unified left-isolated arguments and adjuncts in a uniform way since neither of them requires any postulation of gaps.

The Left Isolate construction is described as a verbal constituent structure with two daughters in which the left daughter is a valence requirement of some predicator that occurs in the right daughter. The left-isolated constituent completes the syntactic and semantic requirements of the element that is lacking in the rest of the clause which follows it. For example,

(32) What does John do?

In (32), we can say that the left-isolated element *what* satisfies the object valence requirement of the verb *do*.¹⁴

Moreover, the valence elements may have their own valence requirements such that an argument can also be a valence element of some remote predicator. When we allow a valence set to contain the reference to a predicate, and the predicate to have an argument as a valence, the argument is a valence element of some distantly embedded predicator. Consider the following example:

(33) What do you suppose his mother wants Mary to ask John to do?

Compared with (32), the string *do you suppose his mother wants Mary to ask John* is added to (33). In (33), *what* is a valence element of a predicator *do*, which is in turn a valence element of a predicator *ask*, which in turn is a valence element of a predicator *want*, which in turn is a valence element of a predicator *suppose*. In

¹⁴ More technically speaking, we should say that the synsem value of the external AVM of the verb of the left-isolated constituent is the synsem value of the object requirement of the verb 'do'. Since nothing significant turns on this fine distinction, we will stick to the informal discussion, but the discussion should mean the thing we have mentioned in spirit.

other words, *what* is a valence element of a valence element of a valence element of a valence element of *suppose*.

Although there are only three intervening valence structures between *what* and *suppose* in (33), the number of intervening structures between the left-isolated valence element and the predicator whose valence it satisfies can be, in principle, higher. Since the distance between *what* and *suppose* can be quite long, we can say that *what* can be a valence element of *suppose* at an arbitrary length or, in more technical CG terms, *what* is a valence requirement of *do* embedded at an arbitrary depth.¹⁵

If we use valence embedding in specifying the most distinctive property of the Left Isolate construction, we can say that in the Left Isolate construction the left daughter unifies with a valence requirement embedded at an arbitrary depth in its right daughter.

The informal discussion of valence embedding in terms of iterations of the relation 'is a valence member of' may be understood in a more perspicuous way by means of the following formal terms.¹⁶

Formally, valence embedding is defined as a relation between two FSs, embedding and embedded FSs, $[\pi]$ and $[\alpha]$, respectively. Given a relation between these two FSs, if we define a unary, as opposed to a binary, operator VAL feature for $[\pi]$ and $[\alpha]$, then $[\pi] = \text{VAL } [\alpha]$ if and only if $[\alpha]$ is an embedded valence requirement of $[\pi]$. For instance, when $[\pi] = \text{VAL } [\alpha]$, that means $[\alpha]$ is

¹⁵ Then, the valence requirement is a special case for an embedded valence requirement in which the embedded valence is the same as the embedding valence.

¹⁶ Valence embedding is employed by anaphora in CG. In Kay's (1994) account of that phenomena, the v-command, defined 'is-a-valence-element-of', is used in place of a canonical c-command relations ('is-a-daughter-of' relations) between antecedents and anaphors.

valence embedded in $[\pi]$ at depth one. When $[\pi] = \text{VAL}^4[\alpha]$, that means $[\alpha]$ is valence embedded in $[\pi]$ at depth four; i.e., $[\alpha]$ is a valence element of a valence element of a valence element of a valence element of $[\pi]$. The notation then can be generalized by using the Kleene star $*$, so that the expression $\text{VAL}^*[\alpha]$ represents an FS in which $[\alpha]$ is valence embedded at an arbitrary depth.¹⁷

Even though we have defined above a general idea of valence embedding that lacks any restrictions, the operation of valence embedding is often constrained in such a way that we need some general notation for the constraints to express this, together with valence embedding. Suppose that we need to add a restriction on this valence embedding at an arbitrary depth. We may represent this restriction by attaching a subscripted FS $[\xi]$. For example, an FS that says $\text{VAL}_{[\xi]}^*[\alpha]$ signifies that an FS $[\alpha]$ is valence embedded at an arbitrary length, and each feature in the sequence of valence embedding satisfies the constraint $[\xi]$. In other words, each valence ancestor of the left-isolated valence element has the properties of $[\xi]$. To illustrate this in another way, if we encounter the expression $\text{VAL}_{[\text{sealed -}]}^4$ this says that the constraint $[\text{sealed -}]$ imposes itself on the intervening four FSs.

We can now use this notation of constrained valence embedding, $\text{VAL}_{[\xi]}^*[\alpha]$, in our representation of the Left Isolate construction by which our informal discussion of the Left Isolate construction can be represented formally. The Left Isolate construction is given in Figure 7.

¹⁷ Even though we do not encounter any linguistic accounts in which the exact number counts.

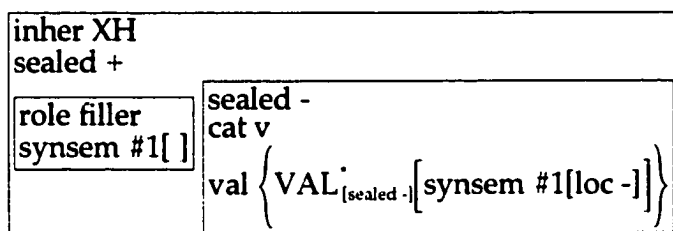


Figure 7. The Left Isolate construction

Figure 7 shows that the Left Isolate construction consists of two daughters. It is a verbal structure since the right head daughter is verbal, as indicated by 'cat v'. This specification of the construction as a verbal structure is achieved by an independent Head Feature Principle. Note that since the right daughter does not mention any information about specific verbal forms, it can be either finite or non-finite.

The notated 'inher XH' at the top of the external structure indicates that Left Isolate inherits the XH construction.

The external semantics of Left Isolate includes the semantics of its right head daughter in terms of the Subset Principle.

The feature structure 'sealed +' in the external structure of the Left Isolate construction captures the fact that the Left Isolate construction is an island.¹⁸ This feature structure is in contrast with the one designated 'sealed -' in the right daughter. What this means is that the target valence element in the Left Isolate construction cannot be in a sealed constituent, and all the valence ancestors of the

¹⁸ We are not here concerned about the nature of 'sealed', i.e., what causes a constituent to be 'sealed'. Presumably both its syntax and semantics, as well as some other processes, are responsible.

left daughter are [sealed -].¹⁹ This is because any predicator in the right daughter permits its arguments to be left-isolated.

Figure 7 shows that the left daughter of the Left Isolate construction is a distance-instantiated element ([loc -]). Hence, it is distinguished from the subject in the SP construction. It satisfies a valence element of some predicator in the right daughter, as indicated by the unification variable #1.

The right daughter is a maximal verb-headed constituent, that is, either a VP or a clause. The notation inside the valence value of the right daughter records three separate but closely related pieces of information.

First, the operator Kleene-starred VAL indicates that there is a valence element which is arbitrarily deeply embedded, which means that there is an unlimited number of optional constituents between the left-isolate constituent and the valence involved. Recall that there might, in principle, be an unrestricted number of other intervening predicators between the left-isolated valence element, and the predicator whose valence it satisfies.

Second, the attached subscript feature structure [sealed -] indicates that there is a constraint on the operation of the long-distance dependency of the Left Isolate construction between the left daughter and the valence element contained somewhere within the right daughter. That is, there is an unlimited number of optional unsealed constituents dominated by the right daughter, and any valence ancestors carry the notation [sealed-]. This amounts to saying that the right daughter structure is not an island. This is in contrast with the information

¹⁹Nevertheless, it might not be that the features, [loc-], and [sealed +], are coextensive. In other words, long-distance dependency and island-hood are independent so that conditional sentences, for example, may involve long-distance dependency, but not an island (Fillmore 1986b).

carried by the Left Isolate construction itself. In the outer syntax we encounter the stipulative feature structure [sealed +], which means that the Left Isolate construction is an island.

Third, the remaining valence value, represented as 'synsem #1[]', when read in conjunction with the same synsem value in the left daughter, indicates that the synsem value of the embedded valence element unifies with that of the left daughter of the Left Isolate construction.²⁰ The formal expression VAL* [synsem #1] effectively says that there is a valence element, which unifies with the left-isolated daughter, which is arbitrarily multiply-embedded in the right daughter. That is, the left daughter fills or satisfies a valence requirement of the predicator that occurs in the right daughter.

Note that what is unified are syntactic and semantic information, so that the case marking effects are maintained between an 'extracted' element and its corresponding valence requirement. The [loc -] value in the synsem of the right daughter represents the fact that the valence requirement is not locally instantiated; that is, it is extracted. Note also that no restriction is imposed on the extracted element; it can satisfy any grammatical function in the valence of the right daughter. In effect, what all of this qualification tells us is that (1) the target valence requirement in the Left Isolate construction cannot be in a sealed constituent, and (2) all the valence ancestors of the distantly instantiated valence element are [sealed -] except for the Left Isolate construction itself.

5.7.3 The Coinstantiation construction.

²⁰ Technically speaking, we should say that the synsem value of the external AVM of the left-isolated constituent is the synsem value of the AVM of the valence requirement embedded at an arbitrary depth in the right daughter.

The Coinstantiation construction in CG roughly corresponds to the phenomena comprising both raising and equi predicates in transformational grammar. It refers to the cases in which the same constituent instantiates valence elements for more than one predicate at the same time.

Consider examples (34) - (37), the sentences of which have similar structures, but different coinstantiation patterns:

- (34) John tried to deceive you.
- (35) John seemed to deceive you.
- (36) Mary persuaded John to deceive you.
- (37) Mary expected John to deceive you.

In all of these cases, the argument in question, *John*, serves a dual function across the constituent boundary: it locally instantiates the argument of the main predicator (*try*, *seem*, *persuade*, *expect*), while at the same time co-instantiating the subject requirement of the downstairs infinitival phrase (*to deceive you*).

Turning to the sentences such as (34) we observe, many details aside, the following facts. First, the verb *try* takes an agent subject and an infinitival verb phrase complement. The complement refers to the function served by a predicate element whose subject requirement is satisfied via coinstantiation. Second, the notional subject of the infinitival verb phrase denotes the same agent subject.

Proceeding with (35), the verb *seem* also takes an infinitival complement, but unlike the case of *try*, it does not impose any thematic role on its subject or its infinitival VP complement.

In the case of (36), the verb *persuade* takes three arguments: the one who does the persuading (agent), the person who undergoes the persuasion

(experiencer) – expressed as the object – and the act which the experiencer intends to carry out as a result of persuasion (content) – expressed as the *to*-infinitival phrase. The NP *John* functions simultaneously as the object of the verb *persuade* and as the understood subject of the verb *deceive*. Therefore, it satisfies the subject valence requirement of the downstairs verb while functioning as the object valence requirement of the upstairs verb. In (36), the synsem properties of the object argument of *persuade* unify with those of the subject of *deceive*.

In the case of (37), the verb *expect* takes two semantic arguments: the one who does the expecting (agent), and the content of that expectation, expressed as the *to*-infinitival phrase. The verb *expect* takes three syntactic arguments. Unlike the case of *persuade*, the second valence member has a null thematic role.

So far, we have talked about coinstantiation with verbs. Here, we will talk about raising and equi adjectives. As expected, the former does not assign a thematic role to its subject, while the latter does. They each have an infinitival complement, and all of the complements must participate in the coinstantiation structures. Consider examples (38) - (39).

(38) John is eager to succeed.

(39) John is likely to succeed.

In the case of (38), the adjective *eager* takes the experiencer subject and the *to*-infinitival complement. The subject of the equi adjective is restricted to NPs, representing a sentient being which is capable of experiencing the emotion of eagerness. The experiencer subject coinstantiates the subject of the infinitival complement. The subject of *be* is also coinstantiated.

In the case of (39), the adjective *likely* coinstantiates the subject of its complement. The subject of the raising adjective is unlimited as long as it serves as the subject of the *to*-infinitival complement.

What the raising and equi predicates in examples (34) - (39) have in common is that they show how an unexpressed subject of a verbal complement is licensed, referring to a higher argument. More specifically, the inherent syntactic and semantic properties of some valence requirement of a verb unify with the subject requirement of one of its other valence elements.

This intuition is captured in CG, which allows unification of the intrinsic value of some valence requirement of a predicator with the corresponding values of the subject requirement of a controlled complement of the predicator. This intuition can be captured by the Coinstantiation construction. The Coinstantiation construction is given in Figure 8.²¹

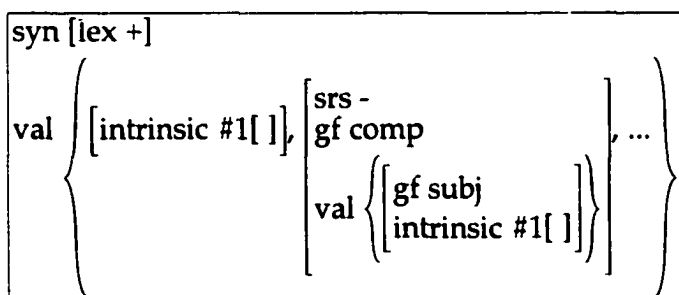


Figure 8. The Coinstantiation construction

²¹ Note that by not mentioning [cat v] in the second valence element, the Coinstantiation construction has wider applicability than noted above, applying not only to the verbal complements of raising or equi predicates but also to all the non-verbal complements (such as NP, AP, PP) of secondary predicates. For more discussion about second predicate constructions in CG, see Fillmore 1996.

The top line of the Coinstantiation construction encodes the fact that the construction unifies with a lexical predictor.

The lexical predictor heads a valence structure that has at least two valence elements: the first is an argument, and the second is a controlled subjectless non-finite verbal complement, as indicated by [srs -] and [gf comp]. There may be other valence elements. This is indicated by the three dots in the valence in the diagram.

The unification index #1[] in the controlled complement, when read in conjunction with the same intrinsic value of the first valence element, indicates that the intrinsic features of the subject requirement of the complement are supplied by another valence element of the predictor. Note that what is unified in Figure 6 are intrinsic features which do not provide any relational information such as grammatical functions and thematic roles. In the case of raising, the valence which must unify with the subject of the verbal complement is the one which has no theta-role assigned to it; in the case of equi, there are semantic principles that determine the controller of coinstantiation.

The unification is obligatory since the subject requirement of the complement is otherwise unspecified. In other words, the subject requirement must be satisfied via coinstantiation with the upstairs valence element which is locally instantiated.

The fact that the controlling element is not realized as a separate constituent corresponds to the fact, stated by other accounts, that it will be realized by a constituent that appears in an argument, as opposed to a non-argument, position.

Since the construction does not mention the type of syntactic categories that it welcomes, that information is carried by each individual lexical item's valence structure. That is, the valence sets of each lexical entry specify what grammatical categories and further subcategories, if possible, it welcomes.

In other words, the Coinstantiation construction will be available for on-line unification, and will be inherited by each lexical construction. For instance, the Coinstantiation construction will be inherited by the *try* construction to express the control of the subject of the complement by the subject of the verb *try*.

Coinstantiation refers to the construction in which an unsatisfied subject requirement of some VP is satisfied. That is, some verbal predicates and non-verbal predicates such as AP, PP, and NP do not locally instantiate their subject constituents but depend on a governing verb to coinstantiate their subject arguments.

5.8 Similarities and differences between Left Isolate, Coinstantiation, and Tough Coinstantiation constructions.

Now I will demonstrate how the similarities and differences between the three constructions are captured in the CG approach.

The observation that the *Tough* Coinstantiation construction has mixed properties of the Left Isolate and the Coinstantiation constructions can be nicely captured by illustrating the relationship between the three constructions, as in Table 1, seen earlier in Chapter 4. Table 1 represents the common ground between the *Tough* Coinstantiation and Left Isolate constructions on the one hand, and

between the *Tough* Coinstantiation and Coinstantiation constructions on the other hand.

	Left Isolate	Coinstantiation	<i>Tough</i>
Non-local argument construal	+	+	+
Long-distance dependency	+	-	+
Single valence structure	-	+	+

Table 1. Relationship between the Left Isolate, Coinstantiation and *Tough* Coinstantiation constructions

The first row of Table 1 shows that all three constructions involve non-local argument construal. In other words, they involve the specification of an argument's semantics by an argument that is not realized syntactically within a local structure. So, in the resulting construct, some argument is construed as instantiating a valence requirement of a predicate that occurs in a syntactic domain not governed by that predicate.

The second row of Table 1 indicates that both the *Tough* Coinstantiation and the Left Isolate constructions share the property, absent in the Coinstantiation construction, of long-distance dependency. Predicates in the Coinstantiation construction impose a constraint on the understood subject of their VP complements, not on an argument of a VP contained somewhere in the control predicates' verbal complement.

The third row indicates that for both the *Tough* Coinstantiation and the Coinstantiation constructions, and not the Left Isolate construction, the entire construction occurs within a single valence structure. That is, in the *Tough*

Coinstantiation construction, there is no left isolate sister in a distinct syntactic position, as there is in the Left Isolate construction.

In sum, the Left Isolate construction requires a long-distance valence set, a separate constituent structure, unification inside valence, and valence embedding for long distance. The Coinstantiation construction requires a long-distance valence set, unification inside valence, but neither a constituent structure nor valence embedding for long distance. The *Tough* Coinstantiation construction requires a long-distance valence set, unification inside valence, and valence embedding for long distance, but not a constituent structure.

Under the CG account, the *Tough* Coinstantiation construction is subsumed by neither the Left Isolate construction nor the Coinstantiation construction. The *Tough* Coinstantiation construction instead shares particular properties of both constructions and is partially unique, satisfying its own well-formedness conditions. Once the existence of the *Tough* Coinstantiation construction is proposed, the seemingly conflicting features of the Coinstantiation and the Left Isolate constructions seen in the *Tough* construction are accounted for, and other properties follow as consequences.

I speculate that that there is an abstract construction which subsumes at least the Left Isolate, the Coinstantiation, and the *Tough* Coinstantiation constructions, and possibly others because these three constructions share the feature of non-local argument construal. If my speculation is correct, these three compose a family of constructions and constitute a network of inheritance relations with the abstract construction, although I admit the abstract construction may not be easy to represent mathematically.

5.9 Comparison with other grammatical theories

If the analysis proposed is correct, it casts doubt on the basic assumption of the distinction between lexicon and syntax in GB, LFG, and early HPSG. Such an account is not available to these approaches due to their general organizational principles. This case study of the *Tough* construction shows that such a widely accepted view cannot be maintained, and points to the desirability of a more flexible design of grammar such as that provided by CG or constructional HPSG (Sag 1997, Bender & Flickenger 1999, Kathol 1999, Koenig 1999, Malouf 1999).

Chapter 6 Conclusion

Transformational grammar has debated for four decades the issue of whether the *Tough* Coinstantiation construction is a species of Left Isolate or of Coinstantiation. I have argued that previous accounts of the *Tough* Coinstantiation construction in terms of either Left Isolate or Coinstantiation are not satisfactory. There are mainly two reasons for this claim. First, the *Tough* Coinstantiation construction shares properties with both the Left Isolate (e.g. long-distance dependency) and Coinstantiation constructions (e.g. single valence structure), and there exists no objective criteria by which one could argue that one of these properties is more marginal than the other. Second, some properties of the *Tough* Coinstantiation construction cannot be explained in terms of either construction.

Having shown that the *Tough* Coinstantiation construction is a variant neither of the Left Isolate construction nor of the Coinstantiation construction, I claim that it is instead a variant of a third independent construction. I demonstrate how Construction Grammar can be used to better understand the similarities and differences among these three constructions.

The relationship of the *Tough* Coinstantiation construction with the other two constructions can be defined in terms of the common constructional inheritance relations and the individual properties parochial to the *Tough* Coinstantiation construction. A common property of these constructions is non-local argument construal. That is, within each

construction, an argument's semantics is specified by an argument that is not realized syntactically within a local structure. I assert that this commonality is inherited by the three constructions from a more abstract construction.

Syntactic and semantic idiosyncratic properties that the three constructions do not share, then, can be attributed to the intrinsic nature of each individual construction.

In the same way that the three constructions originate from a single abstract construction, four different *Tough* lexical constructions branch out from the *Tough* Coinstantiation construction. I derive my four constructions from thethetic vs. categorical readings evoked by the *tough* predicate, *easy*, and from the grammatical form and function of the *for*-phrase with respect to a *tough* adjective (i.e. the *for*-phrase as either a prepositional phrase or the combination of a complementizer and a lower subject). I have shown how these four constructions differ from each other in terms of syntactic, semantic, pragmatic, and valence information.

I have also illustrated how from one to another, *tough* predicates vary widely in syntax, semantics, and valence by considering the NP, *a breeze*, which is similar in meaning to other *tough* adjectives. The treatment of such idiomatic NPs are particularly welcome in CG, which can well capture a construction's mismatch between the internal syntactic form of its NP and the external semantic behavior of its adjective.

Another issue of debate within transformational grammar is the semantic characterization of the *tough* subject with respect to the *tough*

predicate. The *tough* predicate has been claimed to be either a raising predicate or a control predicate. I have argued that although *tough* predicates indeed show a mixture of raising and control properties, they should be treated as raising predicates. This is because the so-called control-like properties of *tough* adjectives appear in the syntactic environment of only the *Tough* construction, and not, say, the extraposition construction. This may result from the fact that the *tough* subject is taken to be a topic, i.e., the subject of a categorical judgment. This mark of judgment presupposes that the addressee already has the referent of the subject in mind, and that the rest of the sentence provides a comment on that topic. Such judgment invites the inference that the comment about a *tough* subject asserts that the *tough* subject has properties, propensities, or reasons that are predicated by the *tough* infinitive. It is thus assumed that the subject in a categorically independent *tough* construct is semantically marked by the predicate, which accounts for the syntactically control-like properties.

In addition to investigating the nature and characteristics of the *tough* gap and subject, and the syntactic and semantic relationships between the two, I have also examined the syntactic and semantic properties of the *for*-phrase and the *tough* infinitive. Syntactically, the *for*-phrase has mainly been identified either as a PP or as a complementizer + lower subject sequence. In terms of semantics, the former identification is regarded as an argument of a *tough* predicate and the latter as an argument of an infinitival predicate. I have asserted that, in general, the *for*-phrase should be treated as a PP, a

dativ argument of the matrix clause. I have also shown how, in some cases, the semantics of individual *tough* predicates calls for a complementizer + lower subject reading.

Regarding the *tough* infinitival phrase, I have contended that it should be analyzed as a gapped VP complement. Categorically, the *tough* infinitival phrase has been considered to be either a VP, an IP, or a CP. I maintain that advocates of the VP analysis provide convincing arguments and data to support their position. These include the absence of cases with *for*-NP phrases, the absence of sentence shifts, the absence of movement out of a sentential complement, and the absence of VP gaps with respect to complementation. Proponents of IP analysis provide data that only seems incompatible with the VP analysis; a closer look at this data shows that these differences are dialectical. And those who have argued for CP analysis provide only theory-internal arguments, and not any compelling empirical data.

Functionally, the *tough* infinitival phrase has been analyzed either as the complement of a *tough* adjective or as the adjunct to a *tough* adjective or adjectival phrase. I have argued for the complement analysis of the *tough* infinitival phrase by demonstrating that the properties that apparently support an adjunct analysis – the similarities between the *tough* construction and the *tough* adjective + nominal construction, the optionality of a *tough* infinitive, null *V'* anaphora, the dissimilarity of the *tough* construction to a *bitch* construction, and purpose infinitive clauses, etc. – can be attributed to

the fact that the *tough* infinitival phrase, unlike a canonical complement, has a missing argument.

The claims I have presented thus far cast doubts on widely held assumptions of grammatical theory. One such assumption pertains to the architecture of grammar and the division between grammatical components. Many syntactic theories make a sharp distinction between syntax and lexicon. Hence, LFG and early lexically-oriented HPSG assign extraction to syntax but control to lexicon.

My demonstration of the way in which the *Tough* Coinstantiation construction straddles the boundary between extraction and control (i.e. the boundary between syntax and lexicon) shows that such a widely accepted view cannot be maintained, and points to the desirability of a more flexible grammatical design such as that provided by CG or recent construction-based HPSG.

Another such assumption concerns the building blocks of syntactic theories. Many syntactic theories such as GB, LFG, and HPSG make a strict dichotomy between complements and adjuncts, even though each theory makes a different claims about the level of grammar at which the distinction should be made. Within CG, however, there is no real distinction between complements and adjuncts since adjuncts are considered augmented arguments that are licensed in the phrasal construction. The debate over whether the *tough* infinitival phrase is a complement or an adjunct, therefore, is moot in CG.

Even though my study is restricted to the *Tough* Coinstantiation construction, it may worthwhile to explore its exact relationship with the extraposition construction with which it is often associated. Even though the two constructions share some similarities, they are distinct in form and meaning. For example, in the *Tough* Coinstantiation construction, infinitives are optional gapped complements, but in the extraposition construction, they are obligatory complements that do not allow any missing elements. Moreover, the *Tough* Coinstantiation construction may invoke both a thetic and a categorical reading while the extraposition construction allows only a thetic reading.

It would be desirable to extend the current study to other 'missing' object constructions, including the degree construction (e.g. *This problem is too difficult for students to solve.*), the *worth* construction (e.g. *This movie is worth watching.*), the *take* construction (e.g. *The Thanksgiving leftovers took several days to eat.*) and pseudo-'missing' object constructions such as the middle construction, the parasitic gap construction, and the purpose infinitival construction. It may also be desirable to extend the study of the *Tough* Coinstantiation construction to other languages. Such future projects would provide us with a better understanding of the *Tough* Coinstantiation construction in the English language.

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