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# Dependent Nexus

Subordinate Predication Structures  
in English and the Scandinavian Languages

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### Abstract

Dependent Nexus:  
Subordinate Predication Structures  
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This dissertation investigates nexuses (subject-predicate structures) in subordinate contexts. Various patterns of data are analyzed using tools from formal syntactic theory. The bracketed sequences in (1) are argued to represent nexuses.

- (1) a. Captain Haddock considers [Thompson to be a spy].
- b. Mr. Wagg wants [Professor Calculus to show him his invention].
- c. Tintin considers [Thomson a spy].
- d. Madame Castafiore wants [Nestor fired].

Differences between examples like (1a) and (1b) have been discussed extensively in the generative literature (e.g. Bresnan 1972); less so examples like (1c-d), which exhibit some of the same contrasts but also some different ones. For example, Pollard & Sag 1993 observe that the bracketed sequence in (1d), but not the one in (1c), can appear in a pseudocleft, as in (2a-b).

- (2) a. \* What Tintin really considers is [Thomson a spy].
- b. What Madame Castafiore really wants is [Nestor fired].

In Chapter 1, I argue that the relation between the subject and the predicate in a nexus is mediated by a phonologically null head (called 'Pred,' for predictor). I also discuss the relation of c-selection (Pesetsky's 1982 term for Chomsky's 1965 'strict subcategorization') and develop a system of head-chains (building on Sigurðsson 1990), which allow features and feature-values to be shared among heads. Finally, I propose a formal notion of dependency. Put briefly, a phrase X is dependent on a head Y if the mapping rules which translate LF (Logical Form) trees into logical representations cannot assign a value to X unless a head-chain is formed between Y and X.

The notions developed in Chapter 1 are applied in Chapters 2 and 3, focusing on examples like (1-2) above. For example, in (2b), *Nestor fired* is independent, because the mapping rules assign it an interpretation. But in (2a), *Thomson a spy* is dependent; it cannot be assigned an interpretation unless a head-chain is formed between Pred and a proposition-taking verb like *consider*. This is possible in (1c), where *consider* c-commands Pred, but impossible in (2a).

In Chapter 3, I take up the verb-particle construction, exemplified in (4).

- (4) a. Thomson and Thompson turned the radio on.
- b. Thomson and Thompson turned on the radio.

I show that the alternation in word-order and many other facts about the verb-particle construction achieve a natural account given the mechanisms developed in Chapter 1, when *the radio on* in (4a) is treated as a nexus. A novel aspect of the analysis is the fact that both orders turn out to be derived; in (4a), the postverbal noun phrase has moved leftward (string-vacuously), and in (4b) the particle has moved leftward (across the noun phrase). The complication introduced by the analysis is justified by the range of empirical coverage. A brief conclusion follows Chapter 3.

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To begin at the beginning, as the King of Hearts advised, I thank my parents, who have always unwaveringly supported me and encouraged me, and who serve as an inspiration to me in ways I cannot begin to express.

My interest in linguistics developed during my struggle to make sense of Norwegian, Swedish, and Old Norse all at the same time, at the University of Trondheim in 1983-84. When I returned the next year to the University of Massachusetts at Amherst I began studying formal generative linguistics. I will always have fond memories of my time at that institution. Thanks to the faculty there for making linguistics fascinating, especially Roger Higgins, Barbara Partee, and Lisa Selkirk, and also Jim Cathey and Frank Hugus in the Germanic department.

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I dedicate this work to my brother Bengt, who loved puzzles.



# Nexus and Dependency

## 0. Introduction

In this chapter I develop and motivate a particular view of some of the basic relations among nodes in a syntactic tree, including predication (the syntactic and semantic relation of a subject to a predicate), subcategorization (the syntactic relation of a head to its complements), and selection (the thematic relation of a head to its arguments). The concepts developed in this chapter are put to use in Chapters 2 and 3 in specific analyses of some small clause constructions. This chapter is organized as follows: §1 develops the concepts of predication and nexus, §2 investigates notions of selection, developing a particular theory of c-selection and head-government, and in §3 I propose a formal sense of dependency which accounts for the failure of certain constituents to enter into anaphoric relations in tree structures.

## 1. Subject and Predicate

I have adopted the term NEXUS from the great Danish linguist Otto Jespersen (his use of the term is discussed in more detail in §1.1.4 below). Roughly, a nexus is a combination of a subject with a predicate; clauses and small clauses are nexuses. In this section I will develop the background assumptions about the nature of the nexus that I will use in the rest of this chapter as well as in Chapters 2 and 3. Section 1 is organized as follows: §1.1 consists of a more or less chronological discussion of some key works bearing on the notions of subject and predicate, the fundamental constituents of the nexus. §1.2 outlines the notions that will be used in this work, distilled from §1.1.

### 1.1. Previous work on predication

In this subsection I sketch some contributions to the notion of predication, as I understand them. This is by no means meant to be a complete history of ideas; I have tried only to give a summary of those works which have influenced my own assumptions in the proposals to come. The previous works are organized in nearly chronological order, beginning with Aristotle, whose work directly or indirectly influenced all of the others.

### 1.1.1. Two views on predication

#### 1.1.1.1. Aristotle<sup>1</sup>

In *De Interpretatione*, Aristotle notes that nouns and verbs represent concepts without themselves being true or false. He goes on to suggest that a noun is a symbol for something without reference to time, while a verb is a sign of what is said about something else; a verb also ‘has a time-reference,’ in the sense that it is only used in conjunction with tense. A proposition (*apophansis*) is the combination of a subject, a verb, and a tense; it has a truth-value, in the sense that it can be evaluated as true or false.<sup>2</sup> There are two ways in which the three elements, a noun, a verb, and a tense, can be composed into a proposition: affirmation (*kataphasis*) and denial (*apophasis*). Multiple propositions can be combined into a single proposition by conjunction, but otherwise, there are no other ways to form a proposition. Thus, every proposition is the affirmation or denial of some property holding of some subject at some time (cf. Int. 17a 23–25).

As Horn 1989 points out, Aristotle’s notion of predication is syncategorematic; there are two ways in which to construct a proposition, and these two ways do not correspond to two different lexical items; denial may be expressed without the word *not* (as in *Socrates never sleeps*), and affirmation may be expressed with it (as in *Socrates is not-sick*). Horn suggests that Montague’s 1970 syncategorematic introduction of tense and negation into sentence denotations may be seen as a formalization of Aristotle’s notion of predication.<sup>3</sup> In more recent work, such as that of Pollock 1989, Laka 1990, and Zanuttini 1991, negation is consigned to a functional head position in the syntactic tree (Pollock’s Neg, Laka’s  $\Sigma$ ); and in other work (e.g. Bowers 1993, discussed below), predication itself has been assigned a syntactic position. If the two ideas are conflated, and predication is conceived of as existing in two

<sup>1</sup> My understanding of Aristotle’s work, and its relevance for current issues in predication, is due in large part to Larry Horn’s excellent book (Horn 1989). For very helpful discussion of Aristotle’s writing I wish to thank Lars Svenonius and Jim Celarier.

<sup>2</sup> Aristotle notes that there are sentences (*logos*) which represent complete thoughts but which are not propositions and therefore do not have truth values; he notes that prayers are one such type, and we might suppose that he was also thinking of questions and so on.

<sup>3</sup> Though it seems likely that Montague adopted this convention in order to avoid introducing tense and agreement as categories; his conception of predication appears to be strictly Fregean, i.e. as function-application (see below).

polarities, affirmation and denial, then we have something corresponding to a modern version of Aristotle's predication.<sup>4</sup> The development of this idea will be traced through the following sections.

### 1.1.1.2. Frege<sup>5</sup>

Frege (1879, 1884, *inter alia*) developed a formal model in which it is possible to construct truth-conditional representations for sentences. Frege drew a fundamental distinction between OBJECT (*Gegenstand*) and CONCEPT (*Begriff*). Objects, typically the denotations of noun phrases, include real, imaginary, and abstract things, and are alike in that properties can be predicated of them. Concepts, on the other hand, are the denotations of predicates, and are by definition incomplete (*ungesättigt* or *ergänzungsbedürftig*); no property can be meaningfully predicated of a concept (see especially Frege 1892b). Formally, a concept is an unsaturated function, which must combine with an object in order to be complete (its DENOTATION (*Bedeutung*) is then a truth-value, and it has as its SENSE (*Sinn*) a proposition; see Frege 1892a).

For Frege, a concept could be represented as follows:  $\Phi(\xi)$ ; the capital Greek letter identifies the concept (say, the concept of being asleep), while the lower-case Greek consonant is a variable, holding a place for an object.<sup>6</sup> Thus, if  $s$  is the symbol corresponding to the individual Socrates, then  $\Phi(s)$  represents the proposition 'Socrates is asleep,' whose denotation would be True or False, depending on whether Socrates is asleep or not (cf. Frege 1894, 1903).<sup>7</sup> The extension of the concept represented by  $\Phi(\xi)$  (its *Wertverlauf*, often translated 'course-of-values') could be modelled as a set of ordered pairs, pairing individuals with truth-values; this set is an object, but the function itself, Frege stresses, could not.<sup>8</sup>

<sup>4</sup> For Laka 1990,  $\Sigma$  has two polarities, negation and affirmation; but for her, the positive value of  $\Sigma$  corresponds to emphatic assertion, as in *She did so order coffee*. On the view I am alluding to here, the positive mode of predication would simply be ordinary affirmation.

<sup>5</sup> Thanks to Barbara Scholz for very helpful discussion.

<sup>6</sup> Two-place predicates, or relations, were  $\Phi(\xi, \zeta)$ . I am ignoring Frege's more complex notational conventions.

<sup>7</sup> Frege also allowed for the possibility that a proposition has no denotation, for example if some noun phrase in it is non-referring. Thus *Socrates is asleep* is neither true nor false if Socrates does not exist.

<sup>8</sup> Frege maintained that every concept has an object as its extension, and that this object is a 'proper' object in being an admissible argument for any concept (that is, for any 'first-level' concept, a one-place predicate over objects, as opposed to such things as quantifiers, which are one-place predicates over concepts, hence 'second-level' concepts; see Frege 1894). This led to the paradox discovered by Russell that

(continued next page)

A version of Frege's formal truth-conditional representation for linguistic expressions has been profitably adopted in modern semantic theory, especially in the tradition that stems from Montague's work (Montague 1970, 1974). In that tradition, there is no syncategorematic operation of 'predication'; predicative expressions, such as verb phrases, are simply represented as functions. Predication is function application, and there is no basic distinction between affirmation and denial (negation is a one-place operation over the denotations of sentences, which has the effect of reversing the truth-value). This position, which Horn 1989 traces back to the Stoics and Cicero, has been very influential in subsequent work on predication (according to Horn 1989:463, "[t]he 2,300-year war between the term logic of Aristotle and the Peripatetics on the one hand and the propositional logic of the Stoics and post-Fregeans on the other seems to have ended in the complete rout of the former camp by the forces of the latter"), though since Horn, one might say Aristotle's troops have rallied.

### 1.1.2. Jespersen

Jespersen's work contrasts sharply with that of Aristotle and Frege. Jespersen, in his work on English grammar, dealt with an incredibly large amount of data, always with an eye to the historical development of a given construction or expression; the concepts he developed were not always formulated with mathematical rigor, but were intended to pick out very fine distinctions among different constructions. In fact, he criticizes unnamed logicians (Jespersen 1924:131 (PG))<sup>9</sup> for analyzing all sentences as if they were copular constructions, charging that this confuses *The man walks* with *The man is walking*, which of course are different. This is not to say that Jespersen is blind to generalizations across constructions; on the contrary, he is extremely sensitive to them, and proposes many notions which not only permeate his analysis of English but are also intended as linguistic universals, such as his concepts of rank and nexus (see Jespersen 1924 (PG) *inter alia* for extensive discussion, and Jespersen 1937 (AS) for development and application of a formal notation of syntactic analysis which captures important generalizations; the concept of nexus is discussed immediately below).

undermined Frege's program of 'logicism'; see e.g. Furth 1964, Bell 1979.

<sup>9</sup> Jespersen's works have appeared in many editions in different years, and are often cited by title rather than by year. For ease of reference I have included standard abbreviations in parentheses following the conventional citation. MEG is *A Modern English Grammar on Historical Principles* (vols. I-VII), PG is *The Philosophy of Grammar*, EEG is *Essentials of English Grammar*, and AS is *Analytic Syntax*.

Thus Jespersen provides a data-sensitive approach to the notion of predication, and points out many subtleties which must be dealt with in any complete account.

Jespersen observed that subjects combine with predicates at a level below that of the clause; he coined the term NEXUS to refer in general to any combination of a subject and a predicate, not only as a sentence or clause, but also in contexts like those in (1). Examples (1a-e) are from Jespersen 1913:10 (MEG II), which predates the term nexus, but Jespersen comments that these examples contain "not two different objects, ... [but] one complex object, made up of two parts standing in the relation of a principal and its adjunct or predicate." Examples (1f-g) are from Jespersen 1924:114-19 (PG). I have placed brackets around the nexus objects in each case.

- (1) a. They called [their boy Tom]
- b. We saw [John come]
- c. He made [John come]
- d. He made [his wife happy]
- e. He acknowledged [himself beaten]
- f. I like [boys to be quiet]
- g. He believes [me to be guilty]

It will turn out that the distinction between nexuses, as in (1), and propositions, which is what Aristotle and Frege were principally concerned with, is a crucial one (cf. Jespersen 1924:115 (PG)).

It will be convenient to follow recent usage and use Williams' 1974 term SMALL CLAUSE for the bracketed sequences in (1a-e), to distinguish them from the (infinitival) clauses in (1f-g), which, like finite clauses, are also nexuses; the small clause will be defined in section §1.2.

Jespersen stresses (cf. Jespersen 1924:117-18 (PG), 1940:7ff (MEG V)) that the direct object of the verb in each of the examples in (1) is not the noun phrase immediately following it, but the entire bracketed sequence, consisting of a PRIMARY plus a SECONDARY (see especially his 1937 volume (AS) for a formalization of the syntactic structure). For Jespersen, a primary is an argument, typically a noun phrase, and a secondary is either an adjunct that modifies an argument, or a predicate predicated of one. The combination of a primary and an adjunct (as in *the barking dog*) is a junction, while the combination of a primary and a predicate is a nexus (as in *the dog barks*). It should be noted that Jespersen scrupulously avoids referring to the postverbal secondaries in (1) as predicates, as he reserves that term for tensed verb phrases, following grammatical tradition (see especially Jespersen 1937:120

(AS)); he occasionally made use of the term 'adnex' (e.g. 1924:97 (PG), 1933:95 (EEG)) or 'predicative' (e.g. 1937, Ch. 9 (AS), 1940:5 (MEG V)) for this element. However, in current work in syntax, the term predicate has acquired a general enough sense that it can be used for the embedded 'secondaries' in (1). Later I will use predicate in a more technical sense, and a terminological distinction will have to be introduced, but for now this can be safely ignored.

Jespersen points out that the predicate in a small clause can be of any category; it can be a verb, as in (1b-c), or an adjective or participle, as in (1d-e); or it can be a noun phrase, as in (2a-b), or a prepositional phrase, as in (2c-d) (1940:11-13 (MEG V)); in addition, he suggests that adverbs appear here, giving (2e) as an example, but presumably *over* could be analyzed as an adjective (cf. the participials *ended*, *done*, or *finished*), or following Emonds 1972 a preposition.

- (2) a. She made a pretty nurse, and his practised eye judged [her a good one].
- b. Your language proves [you still the child].
- c. Neighbors considered [the house in quarantine].
- d. That will mean [a heavy load off my mind].
- e. Savage then imagined [his task over].

It is crucial to distinguish nexus objects, or small clause complements, as in (1-2), from constructions with a direct object containing a postmodifier. The examples in (3) are ambiguous between a small clause (SC) reading and a reading where there is an DP direct object with a postmodifier ((3c) is from Chomsky 1955/1975:271).

- (3) a. I want the puppy in the window.
- b. They believe the revisions made by Stalinists.
- c. I can't catch the dog climbing that tree.

On the SC reading of (3a), I express a desire that the puppy be in the window; this reading is easily paraphrased using an infinitive: *I want the puppy to be in the window*. On the DP reading, I express a desire to have a particular puppy, namely the one in the window. Similarly, the SC reading of (3b) is equivalent to *They believe the revisions to have been made by Stalinists*, and unlike the DP reading in no way entails that 'they' believe the revisions themselves. (3c), as Chomsky notes, has one reading where *catch* means 'capture,' and *the dog climbing the tree* refers to a dog, and another where *catch* means 'discover' and *the dog climbing the tree* refers to a kind of situation.

In addition, SC complements must be distinguished from sequences of a direct object and a depictive predicate, as in (4) ((4a-b) adapted from Jespersen 1940:29 (MEG V)).

- (4) a. They roasted an ox whole.  
     b. They ate the meat raw.  
     c. Karl scrubbed the floor naked.  
     d. The artist painted the model lying down.

In (4), the postverbal noun phrase is the direct object, and the depictive predicate characterizes a state enjoyed by that object at the time of the event described; thus, (4a) does not mean that ‘an ox whole’ is something that was roasted, rather than an ox was roasted while it was whole. I will assume that in these cases, the predicate is an adjunct (perhaps in a nexus with a PRO subject), as in Stowell 1981:263, Rothstein 1983, and McNally 1993. In principle, the adjunct can be predicated of either the subject or the object of the verb; (4d) in particular is plausible on both readings. This construction is discussed again briefly in §1.3 below.

Jespersen used the term INDEPENDENT NEXUS to refer to the familiar subject-predicate sentence; he contrasted this with DEPENDENT NEXUS, which was a nexus that was not independent. This included not only nexus objects, as in (1-2) above, but also nexus subjects as in (5a-b), nexus as the complements of prepositions as in (5c-d), nexus adjuncts as in (5e-f), and even nexus predicates as in (5g-i). Again, I have added brackets for expository purposes.<sup>10</sup>

<sup>10</sup> (5a-b) is from his 1940:37 (MEG V), where he cites Curme 1931; (5c-d) is from his 1940:38-43 MEG V, from Kipling and Dickens; (5e) is from his 1940:50 (MEG V), from Galsworthy; (5f) is from his 1937:42 (AS); and (5g-i) are from his 1940:37 (MEG V), from Lie, Trollope, and Galsworthy. It should be noted that although I am using Jespersen’s examples in this section, all of these are grammatical in modern-day English, and similar examples can freely be generated.

- (5) a. [Three such rascals hanged in one day] is good work for society.  
     b. [These two difficulties overcome] makes the rest easy.  
     c. You sneak back with [her kisses hot on your lips].  
     d. the consciousness of [many talents neglected], [many opportunities missed], [many erratic and perverted feelings constantly at war within his breast, and defeating him]  
     e. The two still knelt, [tears running down their cheeks].  
     f. [Dinner over], we played bridge.  
     g. That’s [another nightmare ended].  
     h. That is [one difficulty over].  
     i. It’s [a great weight off my mind]. – It’s [rather a weight on my wife’s], I’m afraid.

Jespersen’s term dependent nexus applies to a given token of nexus in a particular structure, rather than a kind of nexus; notice that the nexuses in (5) can be independent as exclamations, as in (6).

- (6) a. Three such rascals hanged in one day! That’s good work for society!  
     b. Her kisses hot on my lips?! I wish!  
     c. Dinner over? Hah! I’ve just begun!

Jespersen used the term ‘nexus of deprecation’ to refer to certain independent small clauses like those in (6) (e.g. in Jespersen 1924, Ch. 9 (PG), 1937:82 (AS)); cf. also Akmajian’s 1984 ‘Mad magazine sentences’ (discussed recently in Zhang 1992). They require a certain context and intonation in order to be felicitous (hence the continuations in (6)). What they show is that there is no sense in which the nexuses in (5) are inherently ‘dependent’ as syntactic structures. In §3 of this chapter, I will develop a formal characterization of dependency which will have the result that some, but not all, of the complements in (1), and none of the small clauses in (5), will be called ‘dependent nexus’; as with the term ‘predicate,’ I am straying somewhat from Jespersen’s usage (though my nexus is essentially his).

Jespersen recognized a number of different categories of verbs taking nexus objects (cf. 1940:10-18 (MEG V)), giving numerous examples. Some of these classes will be discussed in Chapters 2 and 3. In addition, he noted that “any verb, whether transitive or intransitive, may be combined with a simple nexus to denote the result or consequence of the action or state implied in the main verb” (1940:23 (MEG V)); by this he meant what is now commonly called the RESULTATIVE construction

(for recent analyses, see Carrier & Randall 1992, Fernald 1992). Some of Jespersen's examples are given in (7).

- (7) a. I could beat thy head flat as a dead frog.
- b. The dog ... would bite us all mad.
- c. They had bled the natives white.
- d. Strong winds had blown some [trees] nearly horizontal.
- e. They were drinking themselves drunk with the Zoyland cider.
- f. He slept himself sober.

Resultatives are different from the other constructions in (1) in that the verb in the resultative construction does not typically select a small clause complement; but neither can examples like those in (7) be analyzed as involving depictive predicates; in some cases even intransitive verbs occur as resultatives (as in (7f)). I assume, then, that resultatives are derived structures (as in Dowty 1979, Hoekstra 1988, Carrier & Randall 1992, Fernald 1992). I will return to these constructions briefly in Chapter 3, §5.

### 1.1.3. The Government and Binding framework

In this subsection I discuss some relevant proposals in the Government and Binding framework (GB). It is this framework, in essence, that forms the analytic basis for this work. The purpose of this subsection is not to provide the reader with an introduction to GB theory; it would unfortunately take too much space to accomplish that, and I must refer the reader unacquainted with the framework to one of the many introductory texts available, for example Lasnik & Uriagereka 1988 or Haegeman 1991. Instead, the purpose is to establish what brand of GB I am assuming, and to introduce definitions for various terms used later in the dissertation, concentrating on those matters most pertinent to the syntactic structure of the nexus.

#### 1.1.3.1. Chomsky

Chomsky's work on these and related topics incorporates a number of elements important to what follows. Here I draw mainly on Chomsky 1981, 1982, 1986a, and 1986b and related work by other authors. First, there is the notion that X-bar theoretic structures can be used to define relations among lexical items and phrases in a construction. Second, Chomsky adopts a formal version of Fillmore's 1968 Case Theory, more commonly known in its later incarnation as THETA THEORY. Arguments are associated with θ-roles corresponding to the basic roles an argument may play in an event or situation (in a very broad sense); a one-place

predicate like *runs* has a single θ-role to assign, one which identifies an argument as the thing running, while a transitive verb like *loves* has two, corresponding to the lover and the loved. θ-roles are generally assumed to be drawn from a short list including, usually, Agent, Theme, Goal, Experiencer, and perhaps a few more (see Grimshaw 1990 for recent discussion and references). Chomsky proposes a one-to-one mapping of arguments and θ-roles, stated formally as in (8) (the notion CHAIN is used to prevent a single argument from receiving more than one θ-role by moving from one argument position to another; a chain includes a moved element and its trace). (See also Chomsky 1981:335 for an earlier formulation.)

- (8) The THETA CRITERION (preliminary; adapted from Chomsky 1986b:97)<sup>11</sup>
- a. Each argument appears in a chain containing a unique θ-position
- b. Each θ-position is in a chain containing a unique argument

θ-POSITIONS are positions to which θ-roles are assigned, e.g. the complement position of a transitive verb, or the subject position of anything that assigns a θ-role to a subject (an 'external' θ-role, in the sense of Williams 1980). Thus (8) requires that each chain containing an argument gets one and only one θ-role.

Another basic GB assumption is that there is a condition on noun phrases, namely the CASE FILTER of Chomsky 1980 (building on work by Vergnaud), which requires that a noun phrase have (abstract) Case. This notion of Case (as opposed to Fillmore's) is closer to the older one of morphological case; the subject of a tensed clause gets nominative Case, the object of a verb gets accusative Case, and the object of a preposition gets oblique Case. For Chomsky (and Vergnaud), the Case Filter is a surface condition on all overt noun phrases, stated as in (9).

#### (9) The Case Filter: \*NP[-Case]

Aoun 1985 proposed a Visibility Condition which links Case-assignment to θ-assignment. For Aoun, a chain is VISIBLE if and only if it contains a Case-marked position (cf. Aoun 1985:76 and Chomsky 1986b:94). The

<sup>11</sup> I have left out mention of 'visibility', to be discussed immediately below. Later, on p. 135, Chomsky gives the following restatement of the Theta Criterion:

[i] A CHAIN has at most one θ-position; a θ-position is visible in its maximal CHAIN

A CHAIN is a generalization over A-chains, A-bar-chains, and expletive-argument chains.

Visibility Condition has the advantage over the Case Filter that it does not apply to predicative noun phrases, on the reasonable assumption that they do not receive θ-roles (however, something like the Case Filter might still be needed to rule out adjunct noun phrases, depending on certain assumptions about adjuncts; cf. Larson 1985). Also, there is the problem that expletives appear to need Case, as argued by Lasnik 1992). Chomsky incorporates the Visibility Condition into the Theta Criterion, as stated in (10)

(10) The THETA CRITERION (from Chomsky 1986b:97)

- a. Each argument  $\alpha$  appears in a chain containing a unique visible θ-position  $P$
- b. Each θ-position  $P$  is visible in a chain containing a unique argument  $\alpha$

Another basic tenet of GB theory that is relevant here is the PROJECTION PRINCIPLE, stated as in (11).

(11) The Projection Principle (adapted from Chomsky 1981:38)

- a. If  $YP$  is in  $X'$ , then  $X^0$  selects  $YP$ .
- b. If  $X^0$  selects  $YP$ , then  $X^0$  selects  $YP$  at  $L_i$ .
- c. If  $X^0$  selects  $YP$  at  $L_i$ , then  $X^0$  selects  $YP$  at all  $L$ .

In the definition, selection may be equated with θ-assignment (this is discussed in §2).  $L$  stands for syntactic Level of representation, ranging over D-structure, S-structure, and Logical Form (LF). Thus (11a) states that the only phrasal elements which may appear in  $X'$  are those which are selected by the head. (11b) states that if a head selects a category, then it selects it at some level; this requires that a selected argument be realized at one of the three levels (barring syntactic processes such as passivization which ‘internalize’ or ‘suppress’ arguments). (11c) is the most important part; it states that selectional relations are realized uniformly across all levels. The idea behind this is that thematic relations should not be changed at any point during a derivation; D-structure is a “pure” representation of thematic structure, where the arguments of a head are assigned θ-roles in particular structural positions; complement θ-roles are assigned within the maximal projection of a head (hence ‘internal arguments’), and a subject θ-role is assigned to the subject position of the clause (hence the ‘external’ argument, external to VP). These arguments may be moved around at S-structure, but they will always remain ‘linked’ in a sense (by coindexed traces) with their D-structure positions, and at LF they will be interpreted as arguments of the heads which assigned them their θ-roles. Recall that the Theta Criterion

was defined over chains, so that no argument could pick up an extra θ-role in the course of a derivation; the Projection Principle can be seen as a way of extending the Theta Criterion to D-structure and LF, since it will not be possible to insert or delete arguments over the course of a derivation (cf. Chomsky 1982:9)

Chomsky notes that the Theta Criterion and the Projection Principle are insufficient to account for the distribution of expletive subjects, which presumably receive no θ-role. For example, when a zero-place predicate like *snows* appears in a sentence, an expletive is necessarily inserted in subject position. Chomsky 1981 assumes that the obligatoriness of subjects in clauses follows from the obligatory expansion of S into [NP Infl VP]. In Chomsky 1982 it is proposed that the requirement that every clause have a subject be added to the Projection Principle, the combined requirement being called the Extended Projection Principle (EPP). However, it is not entirely clear that these two concepts are connected. The Projection Principle requires that certain relations (namely, thematic relations) be isomorphic across strata (to use Ladusaw’s 1985 term), while the requirement that every clause have a subject is clearly a condition on clauses at S-structure; expletives have no status at D-structure or LF. While the Projection Principle seems conceptually well-motivated, the requirement that every clause have a subject is not an obvious consequence of anything at all. Why should it not be possible to simply say, \**Snows*, or \**Appears that he left*? (Note that in those languages in which this is possible, Chomsky assumes that there is in fact a null pronoun). Other questions arise as well: does this requirement hold of infinitival clauses and small clauses, or just tensed clauses? These questions will be explored below.

At this point I think it would be appropriate to briefly mention the Minimalist program laid out in Chomsky 1993. The Minimalist program is the direct descendant of the GB framework, and preserves the basic GB outlook and many GB terms. The general thrust of that work has influenced the analyses adopted in this dissertation, especially in that I have avoided, wherever possible, relying on D-structure and S-structure conditions of the sort that were so familiar up until that paper began to be circulated.

In GB, as mentioned, there are three levels of syntactic representation: D-structure, which is generated by the base rules (X-bar theory, the Projection Principle) plus lexical insertion; S-structure, which is derived from D-structure by applying various transformations, and LF, which is in turn derived from S-structure. Since LF and S-structure are derived by similar mechanisms (Move alpha), they are different strata, rather than different levels, in the sense of Ladusaw 1985. Phonological

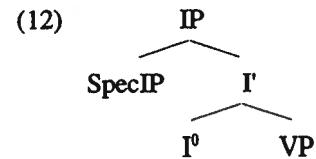
rules derive Phonetic Form from S-structure, and rules of interpretation derive a logical representation from LF. Various constraints, such as the Case Filter and the Extended Projection Principle, hold over individual strata of representation, or perhaps over all of them (the Projection Principle, the ECP (Empty Category Principle) in some formulations).

In the Minimalist program, there is no D-structure or S-structure. Instead, a mechanism (Generalized Transformation, or GT) builds trees from lexical items and other trees. At some point, a tree is converted into a Phonetic Form (Spell Out), after which point there is no further access to the lexicon. There is still LF, but there are no other strata on the same level as LF. PF and LF are different levels, subject to different constraints. There is no D-structure, since GT builds up trees from the lexicon, and there is no S-structure, since the point in the derivation at which Spell Out applies is not considered a separate stratum.

I make an effort in what follows to point out where GB and the Minimalist framework require significantly different treatments of the same data, wherever I am aware that that is the case.

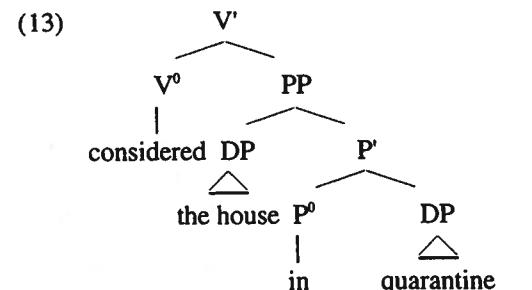
### 1.1.3.2. Stowell

Stowell 1981, 1983, operating in the general GB framework as outlined in §1.1.3.1, proposed a direct mapping from syntactic structure to predicate structure: a predicate is always X' and subjects always occupy SpecXP. The clause, on this view, is a projection of Infl, the locus of tense and agreement features (this idea is also considered at several points in Chomsky 1981). Infl, like other heads, projects a two bar-level phrase, an IP; the subject of the sentence is located in the specifier or Spec position (the sister of X' and daughter of XP), which I will refer to as SpecIP, and Infl (or I<sup>0</sup>) takes a VP complement, as diagrammed in (12).



For Stowell, the small clauses discussed by Jespersen have a structure exactly parallel to that of the clause, except that there is no inflectional element; the small clause is a projection of a lexical head, and the subject is in its specifier, as in (13).<sup>12</sup>

<sup>12</sup> I am using DP for noun phrases in general, following Abney 1987; complement to *in* in (13) might be predicative, in which case it should be NP, following Stowell  
(continued next page)



Following fairly standard GB assumptions about Case-marking, government, and the distribution of empty categories, various facts about small clause structures fall out from Stowell's proposal. The arguments of the small clause head (*the house* and *quarantine* in (13)) receive their θ-roles from that head; as expected, the verb places no selectional restrictions on those arguments (but cf. Rizzi 1992 for an opposing view, with respect to perception verbs). The small clause subject is governed by the higher verb; therefore, the null element PRO is not allowed there (\**John considers lucky*), on the assumption that PRO must be un governed (cf. Chomsky 1981). Since the higher verb governs the small clause subject, it can assign Case to it; therefore, when the verb is passivized, the small clause subject may (in fact must) be promoted to main clause subject position, as in (14a-b) I have bracketed the small clause and marked the D-structural position of the small clause subject with a blank space.

- (14) a. That house is considered [ \_ in quarantine].  
b. The negotiators were made [ \_ uncomfortable].

Stowell 1981, following previous work (see his fn. 27. page 294 for references) argues that various 'raising' structures may be subsumed under this analysis. The standard analysis of sentences like that in (15a) (at least since Kiparsky & Kiparsky 1970) holds that the main subject originates as the embedded subject and 'raises' to the higher position, as indicated by the structure in (15b).

- (15) a. Max seems to be uncomfortable  
b. Max seems [IP \_ to be uncomfortable]

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1991b, Longobardi 1993 Grimshaw 1991 has proposed that such expressions as *by car*, *at school* might be cases of P selecting NP rather than DP.

Stowell suggests that examples like that in (16a), where *seem* appears followed by an adjective, also involve raising, as indicated in the example, and that some copular constructions involve raising as well, as in (16b) (cf. also Ross 1969a for a raising analysis of the verb *be*).

- (16) a. Max seems [AP \_ uncomfortable].  
       b. Jane is [PP \_ in her office]

In other words, the deep complement to the copula is a small clause, and the subject of that small clause raises to the main clause subject position for reasons of Case. Interestingly, this is very much like an analysis by L. L. Hammerich criticized in Jespersen 1937:132-5.<sup>13</sup> Hammerich suggests that the sentence *Das Pferd ist krank*, ‘the horse is sick,’ be analyzed with an existential one-place predicate (*ist*) taking as its argument the small clause *das Pferd krank*; the logical motivation is that the sentence is an assertion that the situation of the horse’s being sick exists. Jespersen objects that the analysis feels “unnatural.” He points out that intuitively, the existential sense of the verb *be* (as in *God is*) is an extension of the copular use, rather than the other way around. He also points out that Hammerich’s analysis makes the wrong predictions regarding agreement (Hammerich would presumably have \**The horses is sick* from [*the horses sick*] *is*). But of course this last complaint does not hold if the small clause is the *deep* complement to the copula. Jespersen’s second objection, that the copula does not seem to have existential force, is especially valid in cases with individual-level predicates (discussed in Chapter 2, §4): *Otto is perceptive* does not mean ‘a situation of Otto’s perceptiveness exists.’ As for the first objection, it may be the case that our tolerance for ‘unnatural’ explanations has increased since 1937. At any rate, Jespersen’s objections are not directed at the idea behind the raising analysis, only at the extension of a raising analysis to the copula. He himself proposed raising-type analyses for such predicates as *seem*, *sure*, and *happen* (in Jespersen 1913, §11.9 (MEG II), 1937 Ch. 16 (AS)). I will adopt the raising analysis for some instances of *be*; this will be discussed further in §1.1.3.3 and §1.1.4 below.

Stowell’s work suggests that the small clause is a basic structure in a number of ways. First, it is basic in the sense that it consists of the maximal projection of a lexical head, along with the satellites of that

<sup>13</sup> I have not read Hammerich, and my understanding of his analysis comes through Jespersen; therefore Hammerich does not appear in the references section here. Jespersen’s 1937:132, fn. 2 citation of Hammerich reads, in toto: “In A Grammatical Miscellany offered to Otto Jespersen. 1930, p. 305 ff., Actes du Deuxième Congrès de Linguistes, Genève 1933, p. 195 ff., Indledning til tysk grammatik. 1935, p. 40 ff.”

head, without any additional structure. Second, it is basic in the sense that many instances of predication involve an underlying small clause, including not only the obvious small clause complements but also copular constructions and (other) raising constructions. Another feature of Stowell’s work is that it suggests a direct mapping from X-bar structural representations at LF onto logical representations, in that subjects always occupy a Spec position and X' is always a predicate. Beyond this, however, no special status is accorded to subjects; a subject, in GB, is like an object except that it occupies a subject position (a Spec position; in later work such as Larson 1988, Chomsky 1993, and Bowers 1993, this distinction is blurred as objects begin to appear in Spec positions). Further work by Stowell on small clause structures will be brought up in later sections, as it becomes relevant; in particular, Stowell 1991a is discussed at length in Chapter 2.

### 1.1.3.3. The Internal Subject Hypothesis

Since Stowell postulated a subject position inside the VP for small clauses with verb heads, as in (17a), he paved the way for what has become known as the Internal Subject Hypothesis (ISH), where it is assumed that all subjects originate within VP, and later raise to SpecIP (Kitagawa 1986, Fukui 1986, Kuroda 1988, Fukui & Speas 1988, Koopman & Sportiche 1988).

- (17) a. Jane saw [VP the students riot].  
       b. [IP Jane [VP \_ saw Max]]  
       c. [IP Max [VP \_ danced]]

This allows a conceptually simpler system of θ-role assignment, as all θ-roles are assigned within the maximal projection of their θ-assigner; the ‘external’ θ-role is assigned to the specifier position of that head, rather than to SpecIP.

In fact, an even stronger position is sometimes assumed, following Stowell’s arguments that there is a subject position available in every lexical XP; on this view, all arguments originate within the projection of a lexical head. This view might be called the Lexical Internal Subject Hypothesis (LISH). The LISH is consistent with the analysis of copular constructions as raising constructions discussed in the previous subsection. In examples like those in (18) below ((18b) is repeated from (16b)), the main clause subject in each case receives its θ-role from the lexical head of the small clause.

- (18) a. Max is [AP \_ uncomfortable].  
       b. Jane is [PP \_ in her office]

The strongest version of the LISH would be one in which all (non-predicative) noun phrases originate as arguments of lexical heads. Even possessors, then, would originate within NP. If the DP hypothesis (Abney 1987) is adopted, in which noun phrases with possessors are projections of a possessive head of the category D, then possessors might raise from within NP to SpecDP in languages like English, paralleling the movement in the clause from SpecVP to SpecIP.

- (19) [DP Tom's [NP \_ friends]]

However, it is not clear that possessive noun phrases should in general be seen as receiving a θ-role from the noun. As Williams 1981a:88 notes, the possessor may hold virtually any relation to the head noun; for example, *Geach's ignorant lumpers* might be the ignorant lumpers that Geach follows, the ignorant lumpers that follow Geach, or even the people Geach called ignorant lumpers (as the expression is in fact used in Horn 1989:508).<sup>14</sup>

A weaker version of the LISH might still be maintained, if every non-expletive argument noun phrase receives a θ-role from some lexical head, within the projection of that head. However, this begs the question of what exactly an argument noun phrase is. Below I will show some more serious problems for the LISH, recently discussed in Heycock 1991.

#### 1.1.4. Syntactic theories of Predication

In this section I discuss works by Williams, Rothstein, and Heycock which focus on predication and accord a special status to the subject. In the views discussed in §1.1.3 above, subjects have a special structural location (Spec) but are otherwise generally treated no differently from other arguments, and predication is a by-product of θ-assignment; the relation between a predicate and a subject is not fundamentally different from that between a verb and its direct object. In GB, every clause has a subject as a result of the stipulation that SpecIP is obligatorily projected

<sup>14</sup> As Barker 1991 points out, there are cases in which the interpretation of possessives is constrained (Barker's LEXICAL POSSESSIVES); for example *the table's leg* is possible, but \**the leg's table* is not. What is important here is simply that there are some possessive constructions in which the relation of the head noun to the possessor noun phrase is not one of predicative head to argument. (Barker's EXTRINSIC POSSESSIVES).

(the EPP), which only accounts for the fact that small clauses obligatorily have subjects if they too are assumed to be projections of Infl.

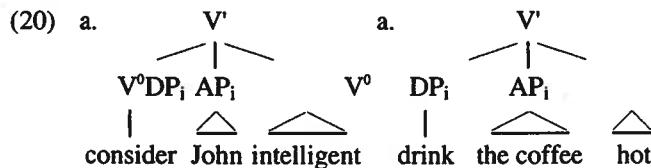
For the authors discussed here in §1.1.4, there is a difference between subjects and complements; for Williams, predication is a special case of θ-assignment, the assignment of an 'external' θ-role, subject to different conditions than the assignment of an 'internal' θ-role; for Rothstein and Heycock predication is a syntactic primitive, independent of θ-assignment, and the requirement that every clause have a subject is built into the conception of predication; it is the nature of a predicate to have a syntactic subject.

##### 1.1.4.1. Williams

Williams 1980 (also 1982, 1983, 1987a, 1987b, 1994, *inter alia*) proposes a theory of predication couched in structural terms, but one different from Stowell's. Specifically, he proposes that a predicate is always a maximal projection, and must be coindexed with a subject under mutual c-command.<sup>15</sup> Taking the distinction between internal and external θ-assignment as basic, he argues that the external θ-role is assigned under coindexing with the predicate (in Williams 1994 it is proposed that this follows from principles of headedness; the external argument is the 'head' of the argument structure of the verb, and its index percolates to VP). The indexing requirement holds of all predicates in the broad sense; tensed VPs as well as selected small clause predicates, resultative predicates, and depictive predicates must be coindexed with a subject.

He also proposes (Williams 1987b:434) that predication is itself a species of θ-assignment; this suggestion will be taken up again in §1.1.4.3 below. Williams allows greater-than-binary branching; thus, even under mutual c-command, a subject need not form a constituent with its predicate in order to be coindexed with it. For example, he argues that the subject-predicate sequences that I referred to as small clauses in (1) above are not constituents at all, but are complements to the verb, sisters under V', as in (20a) (*cf.* Williams 1983); depictive constructions necessarily have the same structure, as in (20b).

<sup>15</sup> Williams adopts Reinhart's 1976 definition of c-command: A c-commands B iff every branching node which dominates A dominates B (the inverse of Klima's 1964 'in construction with').



This makes Williams' notion of predication different from that of Jespersen, for whom a combination of a predicate with a subject formed a syntactic unit. Thus, for Jespersen, the DP-AP sequence in (20a) must be a constituent, complement to the verb, while the AP *hot* in (20b) could not be a predicate; it must be an adjunct of some kind.

Williams argues that Predicate Structure (PS), the level of representation defined by the indexing mechanism, is relevant for control and various other syntactic phenomena (PS is intermediate between S-structure and LF). See Hornstein & Lightfoot 1987 for discussion and an alternative proposal. Williams' proposals form the background for the analyses developed in the works discussed in §1.1.4.2 and §1.1.4.3.

#### 1.1.4.2. Rothstein 1983

Rothstein 1983 argues that predication is a syntactic primitive. She adopts Williams' convention of indicating predication by coindexation, but does not link predication directly to θ-assignment. Instead, she proposes a pair of conditions, one syntactic and one semantic, on all syntactic structures. Like Williams, she adopts a version of X-bar theory (cf. §2.1 below) in which maximal projections (XPs) represent phrases and have a privileged status; syntactically, all XPs are either arguments or predicates. Arguments, which are always DPs or CPs (Rothstein's NP and S'), are subject to the Theta Criterion of Chomsky 1981: each argument must receive a θ-role from a lexical head. Predicate XPs (which can be of any category, including CP and DP), are subject to the rule of PREDICATE-LINKING (RPL), which Rothstein states as in (21).

- (21) *Rule of Predicate Linking* (for English) (Rothstein 1983:11)

- a. Every non-θ-marked XP must be linked at S-structure to an argument which it immediately c-commands and which immediately c-commands it.
- b. Linking is from right to left (i.e., a subject precedes its predicate).

The first half of the condition is intended as a universal condition; it is very similar equivalent to Williams' 1980:206 *C-Command Condition on Predication* (which we might call the CCCP, that abbreviation being currently non-referring), but it defines a predicate as a non-θ-marked XP.

This has the effect of dividing XPs into two classes: arguments and predicates. This means that adjuncts are a kind of predicate (an intuition expressed many times throughout the history of grammatical investigation; see Jespersen 1933:114 ff. (EEG)). In fact, the picture turns out not to be so simple; expletives are neither θ-marked nor predicative, and it is not clear to what extent adjuncts and predicates can be unified. Another difference between the RPL and the CCCP is that Rothstein's definition of c-command uses maximal projections rather than branching nodes (following Aoun & Sportiche 1982; a more recent term is M-COMMAND, M for 'maximal projection,' in Chomsky 1986b). This allows more flexibility in tree structures; for example, the depictive predicate in (20b) in the previous section can be adjoined to V' rather than being its daughter, allowing a structural distinction between the two constructions that was unavailable to Williams (cf. her pg. 16).

Rothstein intends that the second clause of the RPL be language-specific. But it is a necessary clause, since linking is not conceived of as a symmetric relation; although many predicates may be linked to a single argument, a single predicate cannot be linked to more than one argument. Rothstein is forced to make one exception to her rule of predicate linking (fn. 4 p. 22): pleonastics, which do not receive θ-roles, are nevertheless treated as arguments, in that they are coindexed with a predicate, rather than with an argument.<sup>16</sup> However, a zero-place predicate like *rains* is not exempt from (21); it is not θ-marked and therefore must be linked to some argument; an expletive is inserted for this purpose.

Semantically, a non-argument is typically (i.e., apart from special cases like *rains*) an unsaturated one-place function in the Fregean sense. At LF, the argument that is syntactically linked with a predicate is interpreted as its subject. Modifiers, according to Rothstein, are basically predicate-like (for Montague, predicates and modifiers are functors), though they do not take arguments in the sense in which Rothstein uses that term (i.e. an argument must be θ-marked, and a VP is not θ-marked, but a VP modifier is a VP functor).

Rothstein introduces the terms PRIMARY PREDICATION and SECONDARY PREDICATION; her primary predication is that which forms a constituent, including adjunction structures. Her secondary predication is the sort of non-constituent predication that Williams' coindexing convention allows; thus the depictive adjunct is a secondary predicate (it is here she uses the term 'small clause,' which is close to Williams'

<sup>16</sup> In some cases an expletive might also be coindexed with an argument, as in *There are many people sleeping* or *It appears that Mary left*; but in other cases it will not be, as in *It is snowing* or the Norwegian *Det ble danset* 'there was danced.'

original use of the term, but I will be using it in its later sense). In other work (e.g. Holmberg 1986), the term secondary predicate has been used in different ways; I have used it to refer to an embedded predicate, without tense, to distinguish it from the main or clausal predicate, but allowing it to remain ambiguous between a predicative part of a small clause complement and a predicative adjunct.

For Rothstein, as for Williams, predication does not entail constituency of a subject and a predicate; and predication is further divorced from θ-assignment and granted its own, primitive status.

#### 1.1.4.3. Heycock 1991

Heycock 1991 follows Rothstein in arguing that predication is a primitive syntactic relation. Heycock also continues in the direction of separating θ-assignment from predication, arguing that in some cases, noun phrases in subject positions are interpreted as arguments even though they receive no θ-role. This requires a revision of Chomsky's Theta Criterion. Recall that the Theta Criterion (stated in (10) in §1.1.3.1 above) required that each argument chain contain a θ-position. One solution would be to follow Williams' 1987b suggestion that predication is a form of θ-assignment; but as Heycock points out, this would mean that expletives receive a θ-role. If expletives received θ-roles, then the concept of θ-role would have to be completely rethought. Instead, Heycock (1991:227, building on Browning 1987) proposes replacing the Theta Criterion with an Argument-licensing Principle which requires an argument chain to be licensed either by θ-marking or predication. Anticipating my own analysis somewhat, I cast Heycock's examples of non-θ-marked subjects as challenges to the LISH (the requirement that every argument be θ-marked by a lexical head), rather than as challenges to the Theta Criterion.

In one respect, Heycock's conception of predication is more like the GB treatments and Jespersen's nexus, namely in that a predicate always forms a constituent with its subject. The details, however, are different from Stowell's: for Heycock, subjects are adjoined to their predicates.

The most important point in Heycock 1991, for my purposes, is the claim that there are referential subjects which do not receive θ-roles. I will discuss each of her examples in turn. First, there is the tough-structure, discussed in detail in Browning 1987 (see that work for earlier references).

- (22) a. It is tough for anyone to forget Janice.
- b. Janice is tough for anyone to forget.

On the analysis developed in Chomsky 1981, Chomsky 1986a, and Browning 1987 *inter alia*, there is a null operator in constructions like that in (22b); Browning's structures for (22) are given in (23).

- (23) a. It is tough [CP for anyone to forget Janice ]
- b. Janice is [AP Op<sub>i</sub> tough [CP t<sub>i</sub> for anyone to forget t<sub>i</sub> ]]

It can be seen from (23a) that *tough* assigns at most one θ-role, to an infinitival CP. On the assumption (motivated in the works cited) that the *tough* in (23b) is the same *tough*, it assigns only one θ-role there as well. The null operator gets its θ-role from *forget*, and *Janice* is interpreted as an argument by virtue of coindexation with the null operator (not indicated); but *Janice* does not receive a θ-role of its own; contrast the control structure in (24a), where both the overt DP and PRO receive θ-roles, or the reflexive construction in (24b), where both *Kim* and its anaphor receive θ-roles.

- (24) a. Alan wants PRO to leave.
- b. Kim believes herself to dance well.

The coindexation of *Alan* with *PRO* or *Kim* with *herself* in (24) ensures that they will be understood as coreferential; but it does not form an argument chain for purposes of satisfying the θ-Criterion. It is not obvious, then, why the coindexation of *Janice* in (23b) with the null operator should allow *Janice* to escape the θ-Criterion.

Another construction in which the subject does not receive a θ-role from any lexical head is the Pseudocleft construction, discussed extensively in Higgins 1973. In (25a), an example of what Higgins called a SPECIFICATIONAL PSEUDOCLEFT is shown; (25c) is an example of a PREDICATIVE PSEUDOCLEFT. (25b) and (25d) are structures corresponding to Heycock's analysis of each kind of pseudocleft (at an intermediate level of representation; in the specificational pseudocleft, the free relative is argued to move up into SpecCP).

- (25) a. What John is is proud of himself.
- b. [AP PRO proud of himself] is [ what; John is t<sub>i</sub> ]
- c. What John is is important to him.
- d. [ what; John is t<sub>i</sub> ]<sub>j</sub> is [AP t<sub>j</sub> important to him]

I have left unlabeled the free relatives, it being irrelevant for present purposes whether they are CP, DP, or something else (see Bresnan & Grimshaw 1978 for discussion). First, consider the predicative pseudocleft structure in (25d); I have indicated a trace position in the AP to suggest that the free relative may have moved from SpecAP, consistent

with the LISH. This structure, then, is not problematic. Now consider the structure in (25b). There, as Higgins and Heycock argue, the free relative is the predicate; yet there is no lexical head that could be understood as assigning a θ-role to the AP subject *proud of himself*. It is sometimes assumed that the verb *be* is in some cases a θ-assigner (e.g. in Higginbotham 1987), but as Heycock points out, specificational pseudoclefts are licit as small clause structures, without the copula ((26) is from Heycock 1991:213; as she notes, many examples are marginal).

- (26) I consider novels what John writes best.

It seems, then, that we are left without a θ-assigner for the (deep) subject.

Another case involves DP predicates (cf. Stowell 1991b for some discussion of NP and DP predicates in general).

- (27) a. Mary is Max's best friend.  
 b. I consider Mary Max's best friend.  
 c. The man with the mask turned out to be Archie.  
 d. We called him Archie.

The possessor indicates that the predicate is in fact a DP, following Abney's 1987 analysis. If *friend* assigns a θ-role at all, we would expect it to be to the possessor, rather than to the nusal subject (cf. Williams 1981a for discussion of the argument structure of nominals). The small clause structure in (27b) shows again that the copula is not the source of the subject's θ-role. In (27c), a name is used as a predicate (Heycock cites Heggie's 1988 USC dissertation for discussion), a possibility which is excluded from consider-type small clauses for some reason, although it is allowed with other verbs, if *call* as in (27d) can be assumed to take a small clause.

Another construction Heycock points out is the Japanese multiple subject construction (she cites (pp. 246-7) Kuroda's 1965 MIT dissertation, Kuno's 1973 MIT Press book, Fukui 1986, and numerous other works). Heycock gives the following example from Kuno 1973.

- (28) Bunmeikoku-ga dansei-ga heikinzyumyoo-ga mizikai. (Jap)  
*civ.countries-NOM male-NOM avg.life.span-NOM is.short*  
 'In civilized countries the average life span of men is short'

Presumably, the predicate *mizikai* 'is short' can assign a single θ-role; following the works cited, Heycock argues that the 'extra' nominative-marked noun phrases are subjects, but are not θ-marked; certainly they cannot be θ-marked under the ISH or the LISH, by any lexical head.

Finally, Heycock discusses constructions in (colloquial) English with *like*, including the examples in (29).

- (29) a. It seems like it's raining.  
 b. It sounds like your car needs tuning.  
 c. It looks like John failed the exam.

Here, *it* is non-referential; *seem*, *sound*, and *look* are raising verbs taking a complement headed by *like* with a single clausal argument. But just as with the *tough* construction, a referential subject can appear here. The examples in (30a-b) are from Rogers 1971, and (30c-d) are from Heycock (p. 269).

- (30) a. IBM looks like someone's been kiting it.  
 b. Ermintrude looks like the cat got her tongue.  
 c. That book sounds like its publication will cause quite a stir.  
 d. That book sounds like everyone thinks it should be banned.

It should be noted that such examples have a colloquial flavor, even more so than the examples in (29). As Heycock notes, examples like (30c-d) suggest that the verb *sound* does not assign a θ-role to the subject in these constructions; (30c-d) are felicitous as comments on someone's description of a book; the book doesn't make any sound at all. Heycock also suggests that a coreferential pronoun in the embedded clause is not strictly necessary, offering the examples in (31a-d) (her pg. 271).

- (31) a. That book sounds like everyone should own a copy.  
 b. That restaurant sounds like new management would be an improvement.  
 c. Those books sound like the covers should have been replaced long ago.  
 d. That movie sounds like there should be a sequel.  
 e. This place looks like the floor hasn't been swept in weeks.  
 f. This analysis looks like you've been reading too much Frege.

Again, these examples have a very colloquial ring to them (some similar examples border on the ungrammatical: cf. \*?John looks like it's raining, \*?John looks like the exam was difficult), but I agree with Heycock that they are much better than the corresponding relative clause constructions (\*the book that everyone should own a copy), suggesting that the

examples in (31) are not null operator constructions (see Heycock *ibid* for discussion and references to previous work).<sup>17</sup>

We could add to Heycock's litany of problems for the LISH the construction noted by Jespersen in which a nexus serves as a predicate (cf. (5f-h) in §1.1.2 above, repeated here as (32a-c)).

- (32) a. That's another nightmare ended.
- b. That is one difficulty over.
- c. It's a great weight off my mind. – It's rather a weight on my wife's, I'm afraid.
- d. Our biggest problem is pigs in the kitchen.

Here, too, the fact that such constructions are possible in small clauses means that the copula itself cannot be the θ-assigner for the subjects in these cases.

- (33) a. I consider that another nightmare ended.
- b. I regard that as a great weight off my mind.
- c. I consider our biggest problem pigs in the kitchen.

The conclusion is that the LISH cannot be maintained; there are grammatical subjects which do not originate as the arguments of any lexical head. For Heycock, this motivates the status of predication as a primitive, not derivable from θ-assignment. In GB, it is sometimes taken as axiomatic that arguments have θ-roles; this view could be reconciled with Heycock's if predication itself were sufficient to assign a θ-role; but as noted above, this creates problems with expletive subjects. In the next section, I discuss some recent proposals regarding predication that turn out to provide a way of dealing with this apparent impasse, as well as having some other appealing results.

To briefly summarize §1.1.4, the accounts discussed here all had in common that they treated predication as a syntactic device distinct from the taking of arguments. Various subject-object asymmetries support this general outlook. For instance, objects are often syntactically ommissible, for example in elliptical constructions where a generic or indefinite sense for the object is contextually supplied (e.g. *I wrote, I spoke, I painted, I*

<sup>17</sup> One very odd type of example which is about as good as the ones in (31) has *there* as a main subject and *there* as an embedded subject:

[i] There looks like there's a problem.

This seems to support Heycock's contention that the predicate assigns no θ-role to the subject, but raises some other problems; for example, why must the embedded clause have a *there* subject? I will not discuss this sort of example further here.

*lifted*, etc.). A subject, on the other hand, cannot typically be omitted; in a causative-inchoative alternation, a missing causer is not contextually supplied but presumed nonexistent (cf. \**The boat sank to collect the insurance*). Also, a subject position cannot be left empty; an expletive must be inserted. Predication theory allows a more natural account for such facts than does GB, which treats subjects no differently from other arguments, except for their surface position in the syntactic tree; but of course, in GB, structural location is significant: the subject in Spec c-commands the other arguments and the head, and enters into an agreement relation with the head (Spec-head agreement). The accounts discussed in this section took different approaches to the interaction between phrase structure and predication. For Williams, predication occurs under sisterhood; for Rothstein, mutual m-command. For Heycock, the subject is adjoined to the predicate, which means that the subject and predicate form a constituent. In the next section, I explore a proposal that bridges the gap, in a way, between the GB accounts and the predication theory accounts.

### 1.1.5. A head in the small clause

#### 1.1.5.1. Property Theory

In Chierchia 1985 and Chierchia & Turner 1988, a theory of properties is developed which reintroduces Frege's distinction between properties and predicates, lost in the neo-Montagovian tradition of treating all predicates as functors. In Property Theory, a broad notion of entity-hood is adopted, so that not only are individuals entities, but so are properties and 'information units' (units of propositional content). Specifically, there are at least three basic sorts of type e: nominalized functions (sort nf), which correspond to properties, and urelements (sort u), which include individuals and information units (sort i).

As Chierchia 1985 notes, the inclusion of properties in the set of entities allows other properties to be predicated of them, which allows a simple analysis of such expressions as *Swimming is fun* and *To learn French properly takes years* (cf. also Aczel 1978, Bealer 1982).

Two operators are introduced, '◦' and '◦'. ◦ is the predication operator, which takes a property and returns a predicate; it could be assigned the type <nf, e, i>. The nominalization operator, '◦', has the reverse effect: it takes a predicate and returns a property (and is thus type <e, i>, nf>).

Given a Property Theory of this kind, we can assume that all cases of predication are mediated by ◦, reviving Aristotle's notion that predication is an operation combining a subject with a predicate. Of

course, Property Theory itself does not entail that there are no underived predicates, but this is what I will assume below.

In order to allow Heycock's examples of predicates which do not assign  $\theta$ -roles, we need only assume that each of those predicates can be construed as the sort of thing that the predication operator can apply to; for example, *tough for anyone to forget* must be construable as a property (sort nf), as must *Max's best friend* or *a great weight off my mind*. This calls for an independently motivated definition of what it is to be a property, and an investigation of what sorts of things cannot be predicates (for example, *Max intelligent* is a good candidate: \**That's Max intelligent*, \**Our biggest problem is Max intelligent*, etc.). This and related issues will be taken up in §3.

### 1.1.5.2. Bowers 1993

Bowers 1993 argues at length that there is a functional head in the small clause, which he calls Pr[edication] (I will use the abbreviation PRED, in part because it is less easily confused with P (for preposition) and Prt (for particle), standard abbreviations for elements which figure centrally in Chapter 3). In various previous works it had been assumed that there was a functional head in the small clause; in some early generative work, small clauses were derived from full clauses (Ss) by a rule of *to be* deletion (see, e.g. Borkin 1973, 1984). Later work continued to assume that small clauses were some sort of defective clause (e.g. Chung & McCloskey 1987), and when the notion became widespread that the clause is headed by a functional element, a null head was postulated for the small clause as well; thus, for Hornstein & Lightfoot 1987, the small clause is an IP with a null head; similarly for Taraldsen 1991b. Raposo & Uriagereka 1990, building on an idea of Kayne's, proposed that adjectival small clauses have a null Agr[eement] head, allowing the adjectival predicate to agree with its subject. In Raposo & Uriagereka 1993 they develop this idea further, suggesting that there are two different types of Agr, and correspondingly two different types of small clause (this will be taken up again in Chapter 2).

Thus in this respect Bowers' proposal is not new. However, his characterization of the nature of the functional head differs from the other proposals I have mentioned. Building on Chierchia 1985 and Chierchia & Turner 1988, Bowers suggests that (the denotation of) the XP 'predicate' of the small clause is not an unsaturated function, but a property. The functional head Pred has the effect of changing the type of this property, making it an unsaturated function. In other words, Pred is Chierchia's  $\cup$ , relieved of its syncategorematic status and given a syntactic position in the tree.

### 1.1.6. Summary of §1.1

There are certain tensions among the accounts just discussed, but also certain harmonies. In general, it is observed that there is a basic relationship between a predicate and its subject which must be expressed in the grammar. The relation is nearly symmetrical; a predicate needs something to predicate over, and an argument needs some excuse for being in a sentence.

The main division is between those works in which predication is simply the filling in of a missing part of a predicate, as in Frege, Jespersen, Chomsky, Stowell, Williams, and Rothstein, and those works in which a predicate and a subject are combined by some external operation, as in Aristotle, Montague, Chierchia, and Bowers.

Another division is between works in which a nexus is necessarily a constituent, as in Jespersen, Chomsky, Stowell, and Bowers, and those in which it is not, as in Williams and Rothstein.

Finally, there is the tension regarding the proper licensing of arguments. The LISH provides a particularly strong constraint on argument licensing, one which turns out to be too strong, as Heycock shows. Instead, there must be some licensing of subjects (even referential ones) independent of the assignment of  $\theta$ -roles by lexical heads. This can be accomplished using Chierchia's predicator, which I will assume, following Bowers, is syntactically realized. My specific assumptions are outlined in the next subsection.

## 1.2. A distillation

Here I outline the assumptions I will be making in the rest of this dissertation. I address the following issues raised in the preceding sections: whether a predicate can be predicated of an argument with which it does not form a constituent; whether a nexus is necessarily headed, and if so, by what; and what is the status of the Theta Criterion in light of Heycock's examples.

### 1.2.1. Constituency

One of the main objections to the analysis of small clauses as constituents was that they fail to undergo constituency tests, as shown in (34).

- (34) a. \* What we really considered was John an idiot.
- b. \* It was Bill as intelligent that we regarded.

Stowell's (1981, 1983) account for these facts was based on Case theory (the subject of the displaced small clause cannot get Case), but there are problems for this assumption, as Pollard & Sag 1993 point out. However,

the theory of dependency that I develop in §3 below provides an account for the ungrammaticality of the examples in (34), as I detail in Chapter 2. This clears the way for us to adopt the analysis of small clauses in general as constituents, following Jespersen and Stowell.

Some further reasons for believing in the constituency of small clauses (particularly the small clause complements to verbs like *consider*) are worth mentioning here. First, it allows us to adopt a restrictive theory of predication in which subjects appear in the specifier of a predicate, as in Stowell 1981; in fact, it allows an even more restrictive conception of predication, since subjects will always appear in SpecPredP or SpecIP. In addition, it allows for isomorphism between the syntax and the semantics, since small clauses are interpreted as semantically coherent objects (cf. Chapter 2) (this isomorphism is sometimes assumed to be required by the Projection Principle). Finally, it is necessary to believe that at least some small clauses are constituents, because some small clauses, unlike those in (34), do appear in clefts and pseudoclefts, as observed by Pollard & Sag 1993.

- (35) a. What we saw was Michelle drunk.
- b. It was Bill angry that we feared most.

Various additional arguments can be tendered, for example based on the distribution of expletives (the subject of the small clause may be an expletive), binding facts (the subject of the small clause behaves like a subject for binding purposes), extraction facts (extraction from the subject of the small clause is degraded, as it is with subjects). For discussion of these arguments, see Stowell 1981, 1983, 1991a; Heycock 1991; Aarts 1992. Another argument, based on coordination facts, is discussed in Chapter 2.

### 1.2.2. The head

Williams (1983) noted that the small clause predicate is a maximal projection. Thus, it can have a specifier, as in (36), and it can undergo wh-movement, as in (37) ((36a) and (37a) are from Williams 1983).

- (36) a. John considers Bill Bob's friend.
- b. The police consider him the city's most dangerous criminal.
- c. The incident made him the city's most popular criminal.
- (37) a. What does John consider Bill?
- b. How do you want your eggs?
- c. How famous did the incident make the criminal?

This is a serious problem for Stowell's analysis, in which the predicate of the small clause should be an X', a projection almost universally acknowledged to be inert for movement (an exception is Rouveret & Vergnaud 1980). One solution is to postulate, as Koopman & Sportiche (1988) do, a third bar-level; the predicate is X'', and the small clause is X''' (Koopman & Sportiche's X<sup>max</sup>). But this begs the question of what the formal properties of the various projections are; if a non-maximal projection can move, how can we tell, in the usual case, what has moved? And if the small clause subject is located under X''', why is the possessor of a noun phrase located under X'''? These questions do not arise if we adopt the analysis of the small clause as having a functional head. The moved constituent in (37) is the complement of the functional head, and like all complements it is a maximal projection. The functional head has a specifier, and like all functional specifiers it is a landing site for phrasal movement, and perhaps also a licit site for the base-generation of subjects.

One of Stowell's (1981, 1983) arguments against a functional projection in the small clause was that a verb can select the category of the small clause (see Kitagawa 1988, Pollard & Sag 1993 for discussion). However, the analysis of non-local selection that I develop in §2.3 defuses this argument, and allows the verb to select the category of the predicate across the intervening functional head.

### 1.2.3. The nature of the head

For Bowers, the head of the small clause (Pred) is a kind of functor which takes a property (a basic type, in Property Theory) and returns an unsaturated one-place predicate. I will adopt this position as well. It has the advantage that the head of the small clause has a crucial place in the interpretation of the construction; previous analyses have frequently posited a null head, on the basis of indirect evidence for its existence, but usually without being able to characterize the nature of that head except negatively (e.g. as a 'defective Infl').

Actually, Pred could be seen as a kind of Infl, or perhaps, Infl could be seen as a kind of Pred. Infl is the locus of various features which are crucial to the interpretation of the sentence, including at least Tense; in some works, Infl also hosts Negation, Aspect, Modality, and/or subject Agreement features. If Predication is what combines the subject with its predicate, then presumably Infl performs this function as well (alternatively, these various features could be separated into distinct layers, as in Pollock 1989, Chomsky 1991, 1993). The location of Neg in Infl is particularly suggestive, if Pred is Aristotle's affirmation or denial; this would mean that Neg is really just one polarity of Pred. This would

return us to something like the earlier view, noted above, that small clauses are IPs, but for different reasons.

The picture turns out to be slightly more complicated, however. Diesing 1992, building on earlier work by herself and work by Kratzer 1989, suggests that there are two types of Infl, to account for certain contrasts between sentences with stage-level predicates and sentences with individual-level predicates (in the sense of Carlson 1977); these concepts will be discussed in more detail in Chapter 2, §3. Raposo & Uriagereka 1993 suggest, for similar reasons, that there are two types of small clause head. I will adopt a version of these proposals in Chapter 2.

#### 1.2.4. Summary of §1

The interpretations of Aristotle and Frege of the logic of predication in natural language are still at the heart of any current analysis. They both focused on the logic of ‘judgment’ or assertion and denial, and Frege showed how predicates could be seen as mappings from individuals to truth-values. Jespersen, with an eye to the richness of the data, pointed out that the same concept, predication, is central to many linguistic constructions below the level of the clause, most notably in the small clause.

GB theory provides a structural framework for stating syntactic and semantic relations and constraints. Chomsky’s Theta Theory formalizes the predicate–argument relation, a semantic one, in terms of  $\theta$ -roles, and requires that each argument be identified with a  $\theta$ -assigner.  $\theta$ -assignment is subject to structural conditions, intertwining the syntax with the semantics. The Predication Theory developed by Williams, Rothstein, Heycock, and others separates predication from  $\theta$ -assignment, but does not make predication independent of structure; instead, structural constraints are placed on predication which are determined independently of the structural constraints on  $\theta$ -assignment.

When predication is identified with a functional head, as in Bowers, it is possible to maintain the Predication Theory distinction between predication and  $\theta$ -assignment, but to unify the structural conditions on predication and  $\theta$ -assignment, in the spirit of Chomsky and Stowell, *inter alios*; for example, if we assume that Pred (or Infl) can in some cases assign a  $\theta$ -role (as argued by Diesing 1992), then we can maintain the Theta Criterion in the face of Heycock’s data (though the LISH will have to be abandoned, as Pred and Infl are not lexical heads). Discussion of this move will be taken up in Chapter 2.

In addition, the predicator can be tied back to the earliest works on predication; it can be used to capture the distinction Frege was concerned with regarding predicates and properties (as argued by Chierchia &

Turner 1988), and it can be put to use in capturing some of the insights of Aristotle’s discussion of predication, especially with respect to negation (as discussed in Horn 1989).

**2. Head and Complement** The material in this section is in some ways a further development of some ideas I presented in Svenonius 1993d. There, I explored a mechanism, which I identified with Chomsky's 1965 Strict Subcategorization, which allows a head to determine certain kinds of features on its complements. In that paper I attempted to unify various sorts of head-complement relations under feature-checking of heads in derived head positions at LF, in the spirit of Chomsky's 1993 analysis of the relation between T[ense] and V in English. Here I will take a weaker stance, distinguishing head-movement from another kind of head-head relation (head-chain formation) subject to very similar configurational requirements. I do not rule out the possibility that the two mechanisms can be unified, or even that the analysis in Svenonius 1993d is incorrect; but using head-chains instead of abstract head movement turns out to make the analysis here smoother in several respects; one problem in particular is avoided, a problem with coordination which I discuss in §2.1.3.

The section is divided into two main parts: §2.1 on selection, and §2.2 on the mechanism of head-chain formation.

## 2.1. Subcategorization and Selection

### 2.1.1. History

Chomsky 1965 proposed a system of STRICT SUBCATEGORIZATION, whereby a head specifies categorial features on its complements, and a distinct system of SELECTION, which was more semantic in nature and included the subject as well as the object of a verb. Grimshaw 1979, 1981 further motivated the distinction, showing that some verbs allow different syntactic categories with the same semantic function (e.g. *ask* takes a 'question' complement which can be DP or CP), while other verbs allow more than one kind of complement semantically but restrict it syntactically (e.g. *care* selects a proposition, exclamation, or question, but only subcategorizes for CP and not DP). Noting that proposition-selecting verbs almost always allow CP complements, but not always DPs, Grimshaw proposes that each semantic class has a CANONICAL STRUCTURAL REPRESENTATION (CSR), and that verbs generally allow the CSR of their selected class by default.

Pesetsky 1982, 1992 introduces the terms C-SELECTION (C for category) for Chomsky's subcategorization and S-SELECTION (S for semantic) for selection. He proceeds to argue that c-selection can be eliminated, or at least severely reduced; he argues, for example, that whether a proposition-selecting verb appears with DP or not can be

determined by whether it assigns Case or not, a property which Pesetsky argues is distinct from c-selection. For example, the failure of *wonder* and *pretend* to allow DP complements in (38) can be said to follow from their being specified as non-Case-assigners.<sup>18</sup>

- (38) a. I wonder {what his purpose is/\*his purpose}.
- b. They pretended {that there was no problem/\*the absence of a problem}.

The question of whether c-selection for major syntactic categories exists is largely peripheral to my purposes; what is crucial is that c-selection for morphosyntactic feature specifications does exist. I think the issue is sometimes miscast as a question of whether there is 'syntactic' as opposed to 'semantic' selection; certainly, there are generally 'semantic' ways to characterize the sorts of complements that many verbs take. But the fundamental asymmetry between the kind of selectional restrictions that a head can place on its subject and the much greater degree of influence that a head has over its complement show that some sort of split between complements and subjects must be maintained. A particularly

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<sup>18</sup> Rothstein 1992 argues, contra Pesetsky, for c-selection, arguing for Burzio's 1986 position that the property of accusative Case-assignment follows from properties of argument structure independent of subcategorization (viz. whether the verb has an external argument or not); she points out that verbs which for Pesetsky must be lexically specified as non-Case-assigners do assign Case in Resultative and Cognate Object constructions. Pesetsky 1993 is a brief reply to Rothstein's paper, suggesting that the distinction between structural and inherent Case can be used to account for Rothstein's cases of apparent mismatches between Case assignment and c-selection for DP. His arguments do not account for the fact that the selectional restrictions exhibited in examples like those in (38) persist even when the verbs are passivized, as seen in [i] (cf. also Rothstein 1992:123 for related remarks).

[i] a. What exactly his purpose was there was often wondered by the students.  
       b. \* His exact purpose was often wondered by the students.  
       c. That there is no problem is often pretended by parents of drug addicts.  
       d. \* The absence of a problem is often pretended by parents of drug addicts.

This contrasts with the absence of non-derived verbs which require that their subjects be CPs (pace Sag & Pollard 1988; I discuss their putative counterexamples in Svenonius 1993b). What [i] shows is not so much that *pretend* and *wonder* c-select CP, but that Case-assignment is inadequate to distinguish them from DP-taking verbs like *want*, *desire*, *feign*, *fake*, and so on. It may be that, for example, *pretend* c-selects a category like 'irrealis,' which might be a possible value of some feature of C, but not a possible value for any feature of D, and that rules out DPs as complements to *pretend*.

clear case of this is the selection by a head for a particular preposition in its PP complement, for example as in (39) (cf. Williams 1981a:112).

- (39) a. Max insists {on/\*at/\*to/\*by/\*with} his innocence.  
 b. Rachel sticks {\*on/\*at/to/by/with} her story.  
 c. Geoff clings {\*on/\*at/to/\*by/\*with} false hopes.  
 d. Sidney grasps {\*on/at/\*to/\*by/\*with} straws.

Although verbs may appear with PP subjects (cf. §3 below), no verb requires a PP subject, nor does any verb specify a particular P in case it appears with a PP subject. Pesetsky 1992 calls the selection by a verb for a particular preposition L-SELECTION (L for lexical), which he suggests is the 'residue' of c-selection; he suggests that l-selection also allows a verb to select a particular complementizer (much as in Baltin 1989), which enables it in effect to determine finiteness and other features.

In the next subsections, I will develop an account for several different cases of a head determining features on its complement; the phenomenon of control over complements will be seen to be not entirely homogeneous, though certain principles unite the different cases. I will continue to use Pesetsky's term c-selection to refer to a particular kind of influence a head has on its complement, as opposed to s-selection, which a head has on all of its arguments (s-selection can be thought of as identical to θ-assignment). L-selection will be seen, on this view, not to have any theoretical status; it is simply a case of c-selection in which the c-selectional restrictions placed on a particular node are such that the range of possible lexical items that can appear there is limited to one (or some small number; we might want to say that one sense of the verb *switch* l-selects a particle which can be either *on* or *off*; this will be taken up in Chapter 3).

### 2.1.2. Determination of features on complements

The distinction between s-selection, which holds of all arguments, and c-selection, which holds only of complements, was originally motivated by certain subject-object asymmetries. A verb always allows a DP subject, and if semantics permit, other categories may appear there as well. The kinds of restrictions a verb places on its subject are a subset of the kinds of restrictions a verb places on its complement; most notably, there are the interpretational restrictions associated with θ-roles, in that a verb may specify lexically that its subject will be interpreted as an Agent, an Experiencer, and so on. This is commonly represented (cf. Williams 1980, Stowell 1981) by associating with each verb a θ-GRID, a list of roles corresponding to the different arguments; alternatively, a system of lexical representation can be developed in which roles are determined by

relations to lexical primitives (e.g. in Jackendoff 1991, where an Agent is the first argument of the lexical primitive DO, a Theme the first argument of BE AT or GO TO, and so on). There may be other sorts of s-selectional restrictions as well, for example the intransitive verb *feed* may require its subject to be non-human (as in Chomsky 1965), or *disperse* may require its subject to be plural or aggregate; alternatively, such matters could be separated from s-selection, perhaps regarded as part of the CONTEXT for felicitous use, as in Pollard & Sag 1993.

C-selection, on the other hand, allows a much wider range of feature specifications. For example, consider the complements to what might be broadly termed 'causative' verbs, for example *make*, *get*, and *have* in (40).

- (40) a. Kate made the truck {start/?warm/faster/\*started/\*using propane/a creampuff}  
 b. Ellen got the truck {\*start/warm/?faster/started/using propane/\*a creampuff}  
 c. The instant the police arrived, Sam had the truck {start/\*warm/\*faster/started/\*using propane/\*a creampuff}  
 d. By the time the police arrived, Sam had the truck {\*start/warm/\*faster/started/using propane/\*a creampuff}

I will assume that each of the verbs in (40) takes a small clause complement (I am deliberately using an inanimate DP as the subject of that small clause in order to rule out a possible control structure). For *make*, the predicate in that small clause can be a verb, or an individual-level adjective or noun phrase, but not a passive participle or a progressive participle. *Get* in (40b) allows a stage-level adjective, a passive participle, or a progressive participle, but not a noun phrase or a verb. *Have* in (40c) allows a verb when it has a dynamic interpretation, but not in (40d) where it has a stative interpretation. Many of these categories can appear as subjects, as I will discuss in detail in §3 (e.g. *Using propane could damage the truck*), but no verb exhibits the kinds of selectional patterns shown in (40) over its subject.

A similar point is made by the 'aspectual' verbs *begin*, *start*, *continue*, and *keep* in (41).

- (41) a. \* Francis began the truck {run/warm/faster/started/running/a creampuff}  
 b. Kevin started the truck {\*run/\*warm/\*faster/\*started/running/\*a creampuff}  
 c. \* Beth continued the truck {run/warm/faster/cleaned/running/a creampuff}  
 d. Fred kept the truck {\*run/warm/\*faster/cleaned/running/\*a creampuff}

The semantic similarity of *begin* to *start* and *continue* to *keep* suggests that they should have similar s-selectional properties; but *start* and *keep* take small clauses while *begin* and *continue* do not; they take DPs (*Francis began the game*, *Beth continued the job*) and infinitivals (*Francis began to play*, *Beth continued to work*). In fact, *start*, when it takes a small clause, appears to require an 'ING' predicate. Once again, no verb exhibits such restrictions on its subject.

As another example, compare *wish* with *want*, where *wish* takes a finite CP complement, but *want* takes only a nonfinite CP. Similarly, *understand* and *consider*, but not *realize*, appear with an infinitival complement; for many speakers (myself included), *consider* does not occur in this sense with a finite CP.

- (42) a. Jack {wished/\*wanted} that he had never seen those magic beans.  
 b. Jack {wished/wanted} for his mother to be proud of him.  
 c. Jack {understood/realized/\*considered} that the beans were magic.  
 d. Jack {understood/\*realized/considered} the beans to be magic.

But there are no verbs that specify the finiteness of a CP subject. Irrealis modality is often necessary to license a *for* CP, and may prohibit a *that* CP, and similarly a factive context may prohibit a *for* CP which is inherently non-factive, but the verb does not exert the kind of arbitrary influence on its subject that creates the pattern of complements in (42). In (43a-c), different types of subject appear with a range of predicates consistent with propositional subjects; the modal *would* is used to adjust the modality in order to allow the *for* CP in (43a).

- (43) a. For Pippi to defeat the pirates would {defy comment/bother the captain/suffice to impress Mr. Nelson}.  
 b. That Pippi defeated the pirates {defied comment/bothered the captain/sufficed to impress Mr. Nelson}.  
 c. Pippi's defeating the pirates {defied comment/bothered the captain/sufficed to impress Mr. Nelson}.  
 d. Pippi's victory {defied comment/bothered the captain/sufficed to impress Mr. Nelson}.

Of course, some verbs do not take propositional subjects, and therefore are illicit with the clausal subjects in (43a-c), as Vendler 1967 pointed out; for example *occur*, *take place*, *begin*, and so on; to say that a proposition *occurred* is as incoherent as saying that *quadruplicity drinks* or *ideas sleep*. This does not necessarily mean that propositions and events can be s-selected; but it means that having a duration can be s-selected, just as being conscious can (e.g. when a verb assigns an Experiencer θ-role). But nothing like the pattern seen in (42) occurs with subjects; finiteness, subjunctive, and so on are not s-selectable features, though they must be c-selectable.

In Chomsky 1965, such cases of c-selection were modelled by assigning to each verb a SUBCAT[egorization] frame, where the various restrictions that that verb places on its complements are specified (see Pollard & Sag 1993 for a particularly detailed treatment). The subcat frame, or list, can be seen as placing restrictions on sister nodes; a V' headed by a verb with the subcat value <CP> must contain a CP as its only non-head daughter; or a verb with the subcat value <irrealis> must be sister to a node with the feature *irrealis* (or perhaps the value *irrealis* for the feature *Modality*); any other element will have the result that that V' is ill-formed. In this conception, c-selection is local in a very strict sense. A slight variation on this is to assume that c-selection is a relation between a head and the head of its complement, as in Baltin 1989; allowing only head features (in the sense of Gazdar et al. 1985) to be specified on the subcat list has a nearly equivalent effect (as discussed in Svenonius 1993d).

This conception of c-selection makes a straightforward prediction: there should be heads which place c-selectional restrictions on a derived subject, such as the subject of an unaccusative or passive verb. I claimed above that a verb could c-select a *for* CP or a *that* CP, but that s-selection could not distinguish the two.<sup>19</sup> If this is correct, then there might be

<sup>19</sup> Actually, the pattern I am discussing is slightly more complicated than the presence or absence of finiteness. In Chapter 2 I will discuss the fact that *for* CPs have a very  
 (continued next page)

certain passive and unaccusative verbs which allow *that* CP subjects but disallow *for* CPs. This turns out to be the case, as seen in (44).

- (44) a. That Pippi could defeat the pirates was {clear/improbable/likely/certain}.  
      b. \* For Pippi to defeat the pirates {was/would be} {clear/improbable/likely/certain}.  
      c. That Pippi had defeated the pirates was {widely/often} {known/believed/rumored/asserted/claimed}.  
      d. \* For Pippi to defeat the pirates {was/would be} {widely/often} {known/believed/rumored/asserted/claimed}.

Following Bresnan 1972 and Cinque 1990b, I assume that the clausal argument to the adjectives in (44a) originates as a complement. This is clearly correct for the passive verbs in (44c) and the unaccusative verbs in (45).

- (45) a. That Pippi had defeated the pirates came up in conversation.  
      b. That Pippi defeated the pirates came to light this morning.  
      c. That Pippi defeated the pirates will never appear in the history books.  
      d. \* For Pippi to defeat the pirates might come up in conversation.  
      e. \* For Pippi to defeat the pirates would have to come to light.  
      f. \* For Pippi to defeat the pirates would never appear in the history books.

The identification of unaccusative predicates in English is, of course, a tricky matter; but *come* and *appear* are fairly uncontroversial candidates. In contrast, every verb which is clearly not unaccusative and allows a CP subject fails to prohibit a *for* CP; this holds not only of the factive predicates in (46a-b) but also the psychological predicates in (46c-d) (cf. also (43) above).<sup>20</sup>

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different interpretation from *that* CPs; in fact *for* CPs do not denote propositions. The c-selection for *that* CPs may really be c-selection for a proposition; or it may be c-selection for a factive complement (*for* CPs being inherently non-factive, as will be discussed below).

<sup>20</sup> I do not make the complementary claim, that there is no verb which allows a CP subject and prohibits a *that* CP, because of the event-taking verbs noted by Vendler and noted above:

[i] a. For Pippi to defeat the pirates might take hours.  
      b. \* That Pippi defeated the pirates took hours.

- (46) a. That Pippi can lift her horse {proves she's strong/demonstrates her strength/clears matters up/settles our bet}.  
      b. For Pippi to lift her horse would {prove she's strong/demonstrate her strength/clear matters up/settle our bet}.  
      c. That Mr. Nelson can read {astonished Anniken/dazzled Tommy/titillated everyone}.  
      d. For Mr. Nelson to be able to read would {astonish Anniken/dazzle Tommy/titillate everyone}.

Thus it seems that there is a c-selectable feature that distinguishes *for* CPs from *that* CPs, but there is no such s-selectable feature. Furthermore, it seems that c-selectional restrictions are preserved under A-movement to subject position.

Another case of variation among complements that is not seen among subjects is the presence or absence of the complementizer. Certain heads allow the complementizer to be absent, as in (47a-c), while others require it to be present, as in (47d-f) (from Doherty 1993:55).

- (47) a. I say (that) this is true.  
      b. I'm sad (that) he's not here.  
      c. It's a pity (that) he left.  
      d. He chuckled \*(that) you were mistaken.  
      e. I'm flabbergasted \*(that) he said that.  
      f. It's a tragedy \*(that) they died like that.

This is sometimes characterized as a matter of c-selection (e.g. Bresnan 1972); the heads in (47a-c) can be seen as c-selecting IP, while other heads, such as those in (47d-f), c-select only CP (or possibly the CPs in (47d-f) are not c-selected at all; cf. Grimshaw 1990, Doherty 1993 for discussion). However, this is never preserved under A-movement to the subject position; the examples in (48) are quite impossible, though they would perfectly acceptable with the complementizer.

- (48) a. \* This is true has often been said.  
      b. \* He's not here is sad.  
      c. \* He left is a pity.

This suggests, given the preceding discussion, that the possibility of complementizerless complements in (47a-c) is not a function of c-selection. In the account developed below, it will be seen that there is a close relation between c-selection and the kind of head-complement relation that allows complementizerless clauses, but the differences

between the two require some additional machinery beyond the device of c-selection.

Before moving on to the next subsection, I would like to make one more observation about c-selection. Recall that c-selection has always been cast as a local relation; either it holds between a head and its complement, or perhaps between a head and the head of its complement, but it reaches no further than that.

However, I argued in §1 that small clauses are headed by a functional head Pred, which takes a complement corresponding to the predicate of the small clause. If verbs can c-select the predicate of the small clause, as I suggested above (following Stowell 1981 *inter alia*), then the verb exerts c-selectional influence on something which is not its sister nor the head of its sister. One possibility is that there are several different types of Pred (so that a verb can c-select the Pred that takes an ING complement, etc.). This would introduce a multiplicity of kinds of Pred that is not independently motivated (recall that I suggested that there are at least two kinds of Pred; but they will be seen not to line up evenly with the categories of their complements). The other possibility is that the head of the complement moves into Pred, which brings it into a local enough configuration for c-selection. This requires that c-selection is not a D-structural relation, as in Chomsky 1981, but can be satisfied after D-structure, as in Larson 1988. In fact, I will assume below that c-selection is checked only at LF.

### 2.1.3. F-selection and head movement

Given that there is some mechanism of c-selection that allows a verb, an adjective, or a noun to specify various kinds of features on its complements, we might assume that the same mechanism accounts for the fact that C takes an IP complement, that Infl takes a VP complement, that D takes an NP complement, and so on; that is, the complementizer *that* will have a subcat value <IP<sub>+FIN</sub>> and the complementizer *for* will have a subcat value <IP<sub>-FIN</sub>>. Abney 1987 pointed out that the selectional variation for functional heads is more restricted than for lexical heads; in general, functional heads only appear with one category of complement; Abney coined the term F-SELECTION for this sort of selection.

There are some possible exceptions to Abney's claim that functional heads only appear with a certain category of complement. First, under Abney's own analysis of gerunds, the possessive determiner must be able to select either NP or VP (to allow both *his quietly singing the Marseilleise* and *his spatula*), while most determiners select only NP (\**every quietly singing the Marseilleise*). Second, if we adopt Emonds' 1985 proposal that P and C are the same category, then that functional

meta-category consists of elements that select DP (the prepositions) and elements that select IP (the complementizers). A case in point would be *during* and *while*, which are arguably distinguished only by their subcat value; an element like *before* allows both types of complement. If it is accepted that prepositions are a functional category, then the possibility of small clause complements to *with* and *without* but not *at* and *by* also count as counterexamples. Finally, if we follow Abney in taking degree words like *too* and *very* to be functional heads (of the category Deg), and accept Rothstein's 1992 arguments that *too* subcategorizes for a clausal complement (*\*very purple for us to eat*), then it seems that Deg *too* must allow varying subcategorization frames, since e.g. *very* does not allow a clausal complement (*\*very purple for us to eat*).

However, there are other cases of what Abney called f-selection for which it is probably unnecessary to posit a selectional restriction, given certain other assumptions. One such case is the selection of VP by Infl. Assume, following Emonds 1976, Chomsky 1981, and Pollock 1989, that V movement to Infl in languages like French is driven by the need for the verb to acquire or check inflectional features. There are two ways in which this could be wrought into a restriction on the distribution of Infl: one is to say that Infl needs to discharge its inflectional feature values, and must do so onto a verb. Another is to take the Minimalist route (Chomsky 1993) and say that Infl serves no other function than to check features on V, and so it will not be generated if there is no verb with features that must be checked, by principles of economy of representation. For concreteness let us take the first route, and say that in English the crucial feature hosted by Infl and necessarily discharged onto V is called Tense. We can say both that Infl must discharge Tense and that V must receive Tense.<sup>21</sup> For the moment, we can follow Chomsky 1993 in assuming that the verb and Tense always combine under head-movement, which occurs at LF in English; I will return to this below. Furthermore, we can assume that even non-finite Infl has this abstract Tense (as in Stowell 1982) and imparts it to infinitival verbs; this will ensure that in the usual case, non-finite verbs do not occur without Infl (I will return to bare infinitive constructions in §3). This particular approach to the distribution of Infl and C will be further motivated in §3.

On this approach, a lower head (e.g. V) needs some features that it can only get from a higher head (in this case Infl). While this makes sense

<sup>21</sup> It has been argued that Infl in some languages can appear with different categories (e.g. Aissen 1992 for Tzotzil, Doherty (to appear) for Irish), so in those languages either Infl can discharge its features onto other categories than V, or Infl does not need to discharge its features.

for f-selection, it would make less sense for c-selection. We saw that DPs and CPs can generally appear as subjects, which suggests that they do not need to undergo head-movement in order to acquire any particular features; yet their distribution as complements is restricted. However, given the notion of ‘obligatory discharge’ introduced above, the cases that I have been calling c-selection could be subsumed under f-selection as described for the Infl-V relation; say that a verb that c-selects a finite CP, such as *think*, needs to discharge some features that it can only discharge onto a finite CP. This would have the same effect (some allowance would have to be made for optional complements). This has the positive effect that the overall number of grammatical mechanisms is reduced, since it is not necessary to posit a subcategorization relation in addition to the head-head relation.

Now I will briefly address the question of whether such a relation should be seen as being identified with abstract head movement or not. It has been suggested, e.g. in Baker 1988, Stowell 1991a (discussed further in Chapter 2), and den Dikken 1992 (discussed further in Chapter 3), that certain relations among non-incorporated heads can be seen as being due to abstract incorporation; Baker proposes that the Romance causative verb is co-superscripted with the head of its complement at S-structure, and that certain S-structural effects are licensed by this co-superscripting, which in turn is licensed by LF incorporation. The proposals of Stowell and den Dikken are similar in relevant respects. In Chomsky 1993, the Tense feature value on the finite verb in English is checked at LF when V moves into Infl (Chomsky’s T); thus, there, too, a surface effect (overt morphological tense inflection) is licensed by LF head movement. There is a problem for all of these analyses, one which may be very serious. A well-known constraint on coordinate structures is the COORDINATE STRUCTURE CONSTRAINT (CSC) of Ross 1967, which requires that an element not be moved out of only one conjunct. This accounts for the ungrammaticality of (49).

- (49) a. \* Has [John \_ gone] and [Mary will leave]?  
       b. \* What did Mary [notice\_] and [laugh]?

When the same moved element binds gaps in both conjuncts, as in (49c-d), the sentences are grammatical (Ross 1967 called this ACROSS THE BOARD MOVEMENT, or ATB; cf. also Williams 1978).

- (50) a. Will [John \_ go] and [Mary \_ stay]?  
       b. What did Mary [say\_] and [laugh about\_]?

In fact, there are many counterexamples to the CSC; examples very much like that in (49b) are often considered acceptable. But one kind of

counterexample does not exist, namely that in which two different elements are moved out of the two conjuncts, to the same position, as in (51).

- (51) a. \* Has will [John \_ gone] and [Mary \_ leave]?  
       b. \* What how loudly did Mary [notice\_] and [laugh\_]?

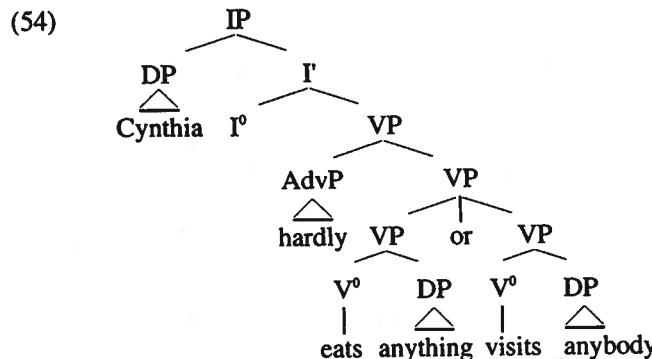
We can call these ATB violations, to distinguish them from the CSC violations in (49). Now, it is a standard assumption that LF is a stratum, not a separate level, and that LF movement is subject to the same constraints that apply to overt movement (see Huang 1982 for evidence of this). It is reasonable to assume, then, that ATB violations are not permitted at LF. If the inflected verb moves to Infl at LF in English, then it should not be possible to coordinate two VPs containing inflected verbs under one Infl. However, it appears that it is possible to do just that.

- (52) a. Cynthia hardly [eats anything] or [visits anybody].  
       b. One person merely [snuck into the cafeteria] and [stole some popcorn].

Such adverbials as *hardly* and *merely* are very restricted in their distribution (see, for example, Jackendoff 1972:51), and do not typically appear to the left of auxiliaries, as indicated in (53).

- (53) a. Cynthia is hardly eating anything.  
       b. ? Cynthia hardly is eating anything.  
       c. One person could merely sneak into the cafeteria.  
       d. ?? One person merely could sneak into the cafeteria.

This suggests that they cannot be adjoined to Infl' (compare *Cynthia usually is eating something*). The fact that the adverbs in (52a-b) scope over both halves of the coordinate VPs suggests a structure like that in (54).



But of course for the main verbs in (54) to move into Infl, as Chomsky's analysis would require, would be a violation of ATB.

One conceivable solution would be to resurrect the machinery of Conjunction Reduction, assumed in early generative work to derive sentences like those in (52) from coordinated sentences (e.g. *One person quietly snuck into the cafeteria and one person quietly stole some popcorn*). However, there are serious obstacles to such an analysis because the reduced construction does not have a reading that the coordinated sentences have (consider the problems with subjects like *the same person*, or *different people*; cf. Partee & Rooth 1983, Sag et al. 1985). In §2.2 I will show how sentences like (52) can be interpreted without postulating Conjunction Reduction and without allowing ATB violations at LF, but still capturing the similarity between languages like French, in which V moves to Infl, and languages like English, in which it does not.

## 2.2. Head Chains

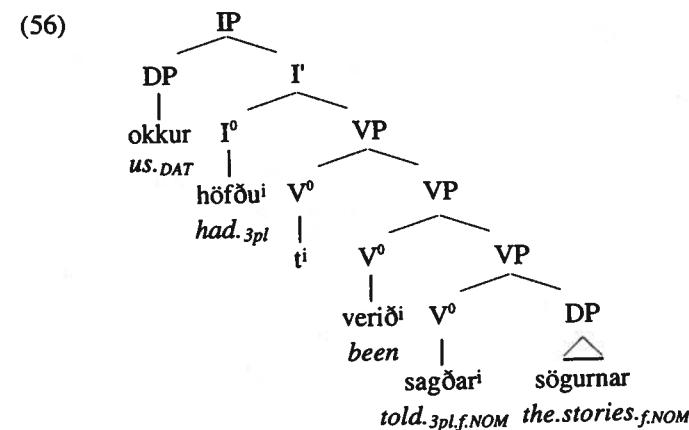
Abstract relations between heads are often posited, for example in analyses of complex predicate formation (e.g. Rizzi 1978 for an account of Romance clause-union that does not involve movement; or van Riemsdijk 1978, Hornstein & Weinberg 1987 on pseudopassives, Christensen 1991 and references cited there on Scandinavian complex passive constructions, Williams 1980 on (subject-subject) raising as function composition). Such abstract relations are often described as 'co-superscripting,' following Rouveret & Vergnaud 1980; in this section I will develop, following work by den Besten and Sigurðsson, what might be thought of as a formal theory of co-superscripting.

Den Besten 1985 and Sigurðsson 1990 develop a formal theory of HEAD-CHAINS that allows certain featural specifications to be shared

among heads in certain configurational relations. For example, consider the Icelandic Dative-Nominative structures in (55) (from Sigurðsson 1991:334).

- (55) a. Okkur höfðu leiðst strákarnir. (Ice)  
*us.DAT had.3pl bored the.boys.NOM*  
 'We had been bored by the boys'  
 b. Okkur höfðu verið sagðar sögurnar áður.  
*us.DAT had.3pl been told.3pl the.stories.NOM before*  
 'We had been told the stories before'

A Dative-Nominative structure is one in which the subject gets dative Case and the object nominative, in a finite clause; this happens in Icelandic with certain experiencer verbs, as in (55a), and certain passive verbs, as in (55b). The finite verbs in (55) agree in person and number with the nominative objects, rather than with the dative subjects. Following Sigurðsson, I will assume that a head-chain is formed from the finite Infl to the embedded verb, endowing it with the ability to assign nominative Case. The head-chain can be represented by co-superscripting the various heads, as in (56) (I use an embedded clause in (56), to avoid the complication of the CP level; I also ignore possible SpecVPs and the base-location of the dative DP *okkur*). Assuming that *hofðu* has moved from V to Infl, I identify its trace as a member in the head-chain.



The participle *sagðar* in (56) assigns nominative Case to its DP complement; the ability to assign nominative Case can be understood as being shared among each member in the chain, as can the agreement

features (notice that *sagðar* itself is third person feminine plural nominative, in agreement with *sögurnar*); alternatively we might assume that only the final element in the chain inherits the initial member's Case-assigning ability; this will be taken up below.

This is a different phenomenon from the impersonal construction, where an expletive appears in subject position, as in (57) (from Sigurðsson 1991:350; the two sentences are synonymous).

- (57) a. *Það mundu kannski einhverjir bátar hafa verið keyptir.* (Ice)  
*there would perhaps some boats.NOM have been bought*
- b. *Það mundu kannski hafa verið keyptir einhverjir bátar.*  
*there would perhaps have been bought some boats.NOM*  
'There would perhaps have been some boats bought'

The DP *einhverjir bátar* 'some boats' is in the nominative case, as indicated. Following Safir 1982, an expletive-argument chain can be formed from the expletive to the embedded argument in such cases, transferring Case to the argument and agreement features to the expletive. Safir 1987 argues that this accounts for the definiteness effect in impersonal constructions (e.g. the DP *einhverjir bátar* in (57) could not be replaced with the definite *báturinn* 'the boat'). But in (55) there is no expletive, and no definiteness effect.

Following Sigurðsson, head-chains are subject to conditions of government, relativized minimality, and barriers; the primary observation to be captured is that head-chains are formed among heads in a head-complement configuration, and do not extend into specifiers or adjuncts. I will propose an explicit definition of head-chains below, slightly simpler than (but essentially equivalent to) that of Sigurðsson. Rather than using government, I will cast it in terms of LOCALITY, as defined in (58). The reason for this is that government, as conceived of in GB theory, is connected with matters of barrierhood and minimality, and these notions play no role in the constructions I will be examining.

#### (58) Definitions of LOCALITY and STRICT LOCALITY

- a. X is local to Y iff X is a head and some projection of Y is a sister to X.
- a. X is strictly local to Y iff X and Y are sisters.

Two nodes are sisters if and only if there is no node dominating one of them but not the other. Strict locality is simply sisterhood (Barker & Pullum's 1989:13 IDC-COMMAND), and is therefore symmetric, but locality is not symmetric. The restriction of X in (58a) to a head means that in practice, Y will always be some projection of a complement of X,

or else it will be a head adjoined to Y. Subcategorization was cast above as a strictly local relation, i.e. a condition placed by a head on its sisters. Subcategorization for heads could be recast as a local relation, given the definition in (58).

For the purposes of discussion I adopt the simple restriction on head-chains in (59) as a partial definition (this will be refined later; see also Sigurðsson for a more detailed proposal).

#### (59) Condition on head-chains (preliminary):

An ordered n-tuple of heads  $\langle \alpha_1, \dots, \alpha_n \rangle$  is a head-chain only if, for every  $i$ ,  $1 \leq i < n$ ,  $\alpha_i$  is local to  $\alpha_{i+1}$

In (56), the head-chain includes both auxiliaries, the trace of *höfðu*, and the passive participle. The terminal element in the chain (the terminus, in Sigurðsson's terms) counts as the nominative Case assigner, and since it governs the DP, it may assign Case to it.<sup>22</sup> A head-chain which enables a terminus to be a Case-assigner can be called a CASE-CHAIN; for Sigurðsson, a head-chain which allows the non-local control of a feature is called an F-chain, where F can be used generally or replaced with the name of the specific feature so controlled.

The formation of head-chains must be constrained. For example, we do not want to allow a noun which is the complement of an accusative-assigning verb to acquire the ability to assign accusative Case. In fact, it seems that only verbs and prepositions ever enter into Case-chains; we could restrict membership in an F-chain to potential F-assigners, meaning that only if X is a member of a category that assigns F can X enter into an F-chain; for example, we could say that the -N categories of Chomsky 1970 are potential Case assigners.

At this point it becomes crucial to distinguish between FEATURES and FEATURE VALUES. A FEATURE SPECIFICATION, in the sense of Gazdar et al. 1985 (especially Chapter 2), is an ordered pair of a feature and a feature-value, for example  $\langle \text{Case}, \text{Accusative} \rangle$ . This is usually represented [Case: Acc] or even just [Acc] (since only the feature Case can have the value Acc). If a syntactic element, say a noun, has a feature specification for the feature Case, this means that it has both the feature Case and a feature value appropriate for that feature. An element cannot have a feature value without having the feature of which it is a value (e.g. a noun cannot be Accusative and not have Case); however, an element

<sup>22</sup> Actually, for Sigurðsson, the entire chain counts as the nominative Case-assigner; for my purposes it is more useful to speak of the terminus as acquiring properties of the higher head.

can have a feature without having a value for that feature, in which case it does not have a feature specification. For example, we might suppose that it is a lexical property of nouns that they have the feature Case; but any value for that feature must be licensed by some Case-assigner. A predicate nominal, then, in a non-Case-assigned position, has the feature Case but no value for that feature.

Now, consider what it means for a verb or preposition to be a Case assigner. We could say that this means that that element has the feature specification [Case-assignment: +].<sup>23</sup> It will be important to distinguish non-Case-assigning verbs, which bear the feature ‘Case-assignment’ but have no value for it, from such things as nouns and adjectives, which do not bear the feature at all. Following Pesetsky 1982 we could say that whether a verb has a value for the feature ‘Case-assignment’ is stipulated for each verb; or following Burzio 1986 we could say that it follows from whether the verb assigns an external θ-role or not. Note that a Case-chain is really a Case-assignment-chain, since the feature value being passed down the chain is not a value for the feature Case, but a value for the feature Case-assignment. I will continue to call the chain a Case-chain, following standard usage.

Now we can define the notion ‘potential F-assigner’: a potential F-assigner is one that has the feature ‘F-assignment’ (and an actual F-assigner has a value for that feature). All members in a Case-chain must have the feature ‘Case-assignment,’ and the Case-chain has the effect of specifying the value for that feature in (at least) the bottommost member to match that of the topmost member.

But feature-chains are still more restricted. We do not see Case-assigning prepositions entering into Case-chains to assign nominative Case to their complements (i.e. Icelandic does not have Dative-Nominative structures where the nominative noun phrase is in a prepositional phrase). In fact, it seems that only non-Case-assigning verbs and prepositions enter into Case-chains (this will be discussed more in Chapter 3). Thus we want to say that any non-initial member of an F-chain must be a potential, but not an actual, F-assigner; or in the terms suggested above, the feature F must be unspecified on all non-initial members in the F-chain.

<sup>23</sup> For languages which distinguish morphological cases, the feature Case-assignment might be a multi-valued feature. I used the value ‘+’ rather than, for example, ‘Acc,’ in order to avoid confusion with the values of the feature Case, which must be kept distinct.

(60) Conditions on head-chains:

- a. An ordered n-tuple of heads  $\langle \alpha_1, \dots, \alpha_n \rangle$  is a head-chain only if, for every  $i$ ,  $1 \leq i < n$ ,  $\alpha_i$  is local to  $\alpha_{i+1}$ ;  $\alpha_1$  is the INITIAL of the head-chain and  $\alpha_n$  is the TERMINUS of the head-chain.
- b. A head-chain H is an F-chain, for any feature F, iff all members of H bear the feature F, the initial of H has a value specified for F, and no non-initial member of H has a value specified for F.
- c. In an F-chain, the terminus inherits the initial’s specification for F.

The terms INITIAL and TERMINUS are adopted from Sigurðsson 1990. Note that in order for a head’s F features to be specified for purposes of (60b), they must be inherently specified, i.e. that head must not have inherited the specification of F by virtue of (60c). Otherwise, the two conditions (60b) and (60c) would impose conflicting requirements on all F-chains.

The question of what heads bear what features is an interesting one. Consider, for example, whether non-finite Infl has the feature ‘Case-assignment.’ It does not assign Case, so it is clearly not ordinarily specified for that feature. On the other hand, finite Infl does assign Case, so it makes sense that in general, Infl should bear this feature. This predicts that it should be possible to form a Case-chain across a non-finite Infl. That this is true can be seen from the construction in (61) (from Sigurðsson 1992a:60).

- (61) % Ég taldi henni hafa verið gefnir bílana. (Ice)  
*I believed her.DAT have been given the.cars.ACC*  
‘I believed her to have been given the cars’

In (61), a Dative-Nominative structure has been embedded under an ECM verb. As is usual in such constructions, the embedded dative subject retains its dative Case despite being governed by an ECM verb. There is no finite Infl in the embedded clause to form a Case-chain to the verb; but the ECM verb can form a Case-chain through Infl down to the embedded verb, allowing it to assign accusative Case to the complement (in a tensed clause, the complement of passive *gefa* would receive nominative, just like in (55)).

However, Sigurðsson points out that for some speakers, (61) is not possible. It seems that for some speakers, a Case-chain always assigns nominative Case. For these speakers, (62) is the only option.

- (62) % Ég taldi henni hafa verið gefnir bílarnir. (Ice)  
*I believed her.DAT have been given the.cars.NOM*  
 'I believed her to have been given the cars'

In (62), the embedded object is nominative; but the fact that the matrix verb agrees with the matrix subject suggests that nominative Case is not coming from the matrix Infl. Possibly for these speakers, the Case-chain is formed from the ECM verb as in (61), but because it crosses Infl the Case assigned is nominative; perhaps the head of the Case-chain determines that there is a value for the feature 'Case-assignment,' but Infl, being closer to the lower verb, determines what that value is.

Yet a third group of speakers do not allow (61) or (62), avoiding Dative-Nominative verbs in ECM contexts altogether. For these speakers it may be that the accusative Case-assignment feature is sufficiently distinct from the nominative Case-assignment feature that non-finite Infl is not regarded as a potential (accusative) Case-assigner. I will not speculate further on these matters, but turn to some cases of feature-chains not involving Case.

Sigurðsson proposes that the long-distance control of mood (i.e., the selection by certain verbs for subjunctive CP complements) and tense in Icelandic is also a matter of head-chains; in Icelandic, subjunctive embedded clauses must have the same tense as the higher clause. Example (63) is adapted from Sigurðsson 1990:18.

- (63) a. María hefur sagt að Ólafur {hafi/\*hefði} farið. (Ice)  
*Maria has said that Olaf has/ had left*  
 'Maria says that Olaf has left'  
 b. María hafði sagt að Ólafur {hefði/\*hafi} farið.  
*Maria had said that Olaf had/ has left*  
 'Maria said that Olaf had left'

Here we can say that indicative Infl is specified for Tense, and the various verbs and complementizers bear the feature Tense but are not specified for it.<sup>24</sup> In each of the examples, a Tense-chain is formed from the matrix Infl to the embedded Infl, which has the effect that the embedded Infl inherits the Tense specification of the higher Infl. In

<sup>24</sup> A similar relation may hold for the mood value: the clausal complement of a verb that heads a subjunctive clause may also be subjunctive (Thráinsson's 1976, 1990 'domino effect'). However, this may be something different, as Thráinsson shows examples of subjunctives in adjunct clauses controlled by a higher subjunctive Infl. Note that the condition on head-chains stated in (60) excludes chains into adjuncts.

embedded indicative clauses, no Tense-chains are formed because indicative Infl is specified for Tense.

One question that arises is why should a Tense-chain be formed in (63)? If the Tense-chain were not formed, there would be nothing requiring the observed Tense concord. A plausible answer is that subjunctive Infl needs a Tense specification, but cannot be inherently specified for it. The only way for subjunctive Infl to acquire a Tense specification is by the formation of a Tense-chain.

A similar effect may be seen in English infinitival constructions, although there is no overt morphological indication of Tense there. Consider the contrast in (64).

- (64) a. Tintin believes Captain Haddock was drinking.  
 b. Tintin believes Captain Haddock to be drinking.

It is impossible to construe the embedded clause in (64b) as being evaluated at a time different from the utterance time. The present tense in the matrix clause necessarily binds the Tense of the lower clause. It is reasonable to assume that infinitival Infl bears the Tense feature, but is unspecified as to its value (cf. also Stowell 1982, Borer 1986 for suggestions that non-finite Infl has a Tense feature). If the interpretation of the embedded clause requires a value for the Tense feature, then a Tense value must be supplied, so a Tense-chain is obligatorily formed in (64b) and the embedded Infl receives the same specification as the higher Infl. This will be expanded in Chapter 2 below.<sup>25</sup>

Now recall the problem raised in §2.1.3 above with respect to LF head movement. There, it was pointed out that under Chomsky's 1993 proposal, V moves to Infl at LF in English; the problem was that this results in ATB violations (in sentences like *Westley sings and dances*). Now, head-chains are clearly conceptually very similar to head movement; it is no accident that they are subject to the same configurational restrictions (this is especially clear in Sigurðsson's formulation, less so in mine only because I used the notion of locality rather than government). If it is true that head-chains can control Tense features, then we can assume that V does not move to Infl in English at all. Instead, a Tense-chain is formed from Infl to V, which has the result that Tense feature values are specified on V. Since we allow feature

<sup>25</sup> Note that using the perfect auxiliary *have* in the embedded clause does not actually make the tense of the embedded clause independent of the tense of the higher clause, e.g. in *Tintin believes Captain Haddock to have been drinking*) Although Captain Haddock's drinking, in such cases, may have occurred prior to Tintin's belief, the Captain's state of having been drinking is simultaneous with Tintin's belief.

specifications which are not morphologically overt, we can say that all non-participial verbs have a Tense feature but need a Tense feature specification. This they can only get from Infl. I will return to this in §3 below.

Formation of head-chains into coordinate structures will not result in ATB violations; since the feature values being specified are identical in both conjuncts, the head-chain is consistent with a version of the CSC modified to apply to structures in which no movement occurs; for example, F-chains from a head X may be formed with the heads Y and Z of a coordinate structure iff an F-chain from X to Y is licit and an F-chain from X to Z is licit.

### 2.3. Summary of §2

I have attempted to establish, in this section, that there is a relation between a head and its complement which goes well beyond the kind of semantic role determination usually associated with s-selection. This relation also goes beyond the simple determination by a head of the major category of its complement; a head can require specifications on its complement for a number of features, including at least such morphosyntactic features as inflectional form but also certain features not necessarily realized morphologically, for example ‘factive’ or ‘irrealis.’ I have used Pesetsky’s term c-selection to refer to this relation.

I have also proposed that the notion of head-chain (as formalized by Sigurðsson) be used to express certain other head-complement relations, including some analyzed elsewhere as involving abstract head-movement. The mechanisms of c-selection and head-chains as laid out in this chapter will be important in the analyses in §3 and in Chapters 2 and 3.

### 3. Dependency

Constructions analyzed as involving movement have been used since the earliest days of generative grammar as ‘constituency tests,’ based on the quite plausible assumption that only a syntactic constituent is able to undergo movement (equivalently in more recent non-derivational analyses, since the filler linked with a gap is always a constituent).<sup>26</sup> Passing constituency tests must be seen as a sufficient but not a necessary condition on the constituent status of a string, since there are conditions on each constituency test, and on movement in general. In this section, I discuss some of those conditions, and develop a formal notion of DEPENDENCY which accounts for the failure of some constituents to undergo constituency tests.

The basic idea is that certain constituents are semantically ‘incomplete,’ and need something in order to be interpreted. This something will be supplied by a higher head through a head-chain. Developing some ideas of Chierchia’s (1985), semantically incomplete constituents do not correspond to basic types, and therefore cannot enter into anaphoric relations such as are imposed by constituency tests. Thus a dependent element is one that is semantically incomplete.

#### 3.1. The failure of constituents to pass constituency tests

Some constituents pass some tests and fail others. For example, the bracketed PP is a constituent in (65); this is supported by the fact that it can be displaced in a Cleft, as in (65b). But a Pseudocleft will not displace a selected PP, as shown in (65c). On the other hand, a CP can generally be displaced in a Pseudocleft, whereas this is not possible for a Cleft, as shown in (66).

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<sup>26</sup> Of course, some constituency tests are notoriously difficult to apply with any confidence, for example Coordination (cf. Gapping structures, as in Hankamer 1971) and Right Node Raising (cf. Abbot 1976, Swingle 1993). Such constructions as Clefts, Pseudoclefts, WH-questions, VP-Fronting, and Topicalization (including V2) are still generally taken to be reliable indications of constituency, however.



- (65) a. The quality of the pizza depends [on the mozzarella].  
       b. It is [on the mozzarella] that the quality of the pizza depends.  
       c. \* {What/Where} the quality of the pizza depends is [on the mozzarella].
- (66) a. They think [that pizza is Italian].  
       b. \* It is [that pizza is Italian] that they think.  
       c. What they think is [that pizza is Italian].

In such cases, the constituency of the bracketed string is not at issue; the applicability of a single uncontroversial constituency test is sufficient to establish that a string is dominated by a single node. I will not attempt to account for the restrictions on the Cleft and Pseudocleft constructions (for extensive discussion of the latter, see Higgins 1973). Instead, I will be concerned with constructions in which a string fails to undergo any constituency test, yet in which there are reasons to believe that that same string is a syntactic constituent.

One such example is VP in (Standard) English. The 'stacked VP' suggested by the bracketing in (67a) has been widely adopted (see Jespersen 1937:92 (AS), Ross 1969b, McCawley 1971, and Pullum & Wilson 1977 for arguments). However, the usual constituency tests do not seem to support it; for example, the VP headed by the perfect participle resists Pseudoclefting, Clefting, VP fronting, and *Though* fronting, as shown in (67b-e).

- (67) a. Elvis has [left the building]  
       b. \* What Elvis has is [left the building]  
       c. \* It is [left the building] that Elvis has.  
       d. \* [Left the building], I suppose Elvis might have.  
       e. \* [Left the building] though Elvis has, we'll stand here and yell anyway.

Now, there are two possible accounts for this fact. One is that the peculiar restrictions on the various constituency tests applied in (67) just happen to all be incompatible with the displacement of a VP headed by *been*. The other is that there is some basic principle at work which prevents (this sort of) VP from being displaced, for example VP might be 'incomplete' in the sense that X' is incomplete. In the former case, we would expect to be able to find other languages in which VP displacement was possible, whereas in the latter case we would not.

In Norwegian and German, there is an auxiliary verb corresponding to (and cognate with) *have*, and its perfect participle VP passes constituency tests, as shown in (68).

- (68) a. Elvis har [forlat bygninga]. (Nor)  
       *Elvis has left the.building*  
       b. Elvis hat [das Gebäude verlassen] (Ger)  
       *Elvis has the building left*  
       c. [Forlat bygninga] har Elvis allerede. (Nor)  
       *left the.building has Elvis already*  
       d. [Das Gebäude verlassen] hat Elvis schon. (Ger)  
       *the building left has Elvis already*

Since the past perfect structures are closely parallel (syntactically, morphologically, and semantically) in English, Icelandic, Norwegian, and German, the natural conclusion is that the ungrammaticality of (67b-e) is due to some language-particular constraint, or perhaps even several different language-particular constraints on the Cleft, Pseudocleft, *Though*-fronting and so on.

There are other cases, however, which call for a more principled account. IP cannot be displaced in any of the Germanic languages.

- (69) a. \* Elvis has left the building, I doubt (that).  
       b. \* It was Elvis has left the building that I doubted (that).
- (70) a. \* Elvis har forlat bygninga tror jeg ikke (at). (Nor)  
       *Elvis has left the.building believe I not (that)*  
       b. \* Elvis das Gebäude verlassen hat glaube ich nicht (daß). (Ger)  
       *Elvis the building left has believe I not that*

In contrast, CP can be displaced in all of the Germanic languages.

- (71) a. At Elvis har forlat bygninga tror jeg ikke. (Nor)  
       *that Elvis has left the.building believe I not*  
       b. Daß Elvis das Gebäude verlassen hat glaube ich nicht. (Ger)  
       *that Elvis the building left has believe I not*

Since all of the Germanic languages allow IP complements (that is, they allow finite clausal complements with no determiner, which I assume are IP following Bresnan 1972, Webelhuth 1992, and Doherty 1993), and none of them allow those complements to be displaced, we need a grammar which rules out the displacement of IP in principle.

One proposal for the limited distribution of complementizerless clauses was put forth by Stowell 1981. Stowell adopted the position that subordinate clauses are always CPs, and suggested that if complementizerless subordinate clauses contain a null C°, then that C° should be subject to the ECP (the Empty Category Principle of Chomsky 1981:250, which requires that an empty category such as a trace be

properly governed; see Rizzi 1990 for more recent discussion). The distribution of complementizerless clauses will then be limited to governed positions such as the complement position; the sentences in (70) are correctly ruled out.

However, it is unclear why this null complementizer should be subject to the ECP; assuming that there is also a null complementizer in a controlled infinitival clause, that complementizer must escape this requirement. Furthermore, other null-headed constituents do not seem to be subject to the strict distributional limitations of complementizerless clauses; null determiners, for example, are widely assumed for names and bare plurals (Abney 1987, Stowell 1991b, Longobardi 1992), but determinerless DPs freely appear in ungoverned positions (at least in English; Longobardi 1992 argues that this is not the case in Italian). Doherty 1993:38-42 for a number of cases of ungoverned null complementizers.

Furthermore, as Doherty 1993 points out, non-complement clauses require complementizers even when they are in what are arguably properly governed positions. Doherty notes (p. 34) that Chomsky 1986a takes the relative acceptability of examples like that in (72a) to indicate that the subject of the embedded clause is L-marked, which entails that it does not form a barrier to government. This suggests, as Doherty observes, that the subject is properly governed, which in turn suggests that its head is properly governed; but the complementizer head of the embedded subject in (72b) (from Doherty 1993:35) cannot be omitted, as indicated.<sup>27</sup>

- (72) a. Who do you consider [friends of \_] to be stupid?  
     b. I consider [\*(that) he is an idiot] to be obvious.

As a final objection to an ECP account for the distribution of complementizerless clauses, note that it is unclear why government should not be satisfied under reconstruction, at LF.<sup>28</sup> For example, DPs

<sup>27</sup> My hedging ("suggests") is due to the fact that there are so many different definitions of proper government. The definition given in Rizzi 1990, for example, states essentially that X properly head-governs Y if X is a lexical head, X c-commands Y, no barriers intervene, and Relativized Minimality is respected (cf. Rizzi 1990:25, 31-32). In (72), *consider* is a lexical head, *consider* c-commands *that*, no barriers intervene between *consider* and *that*, and Relativized Minimality is respected (i.e. there is no potential head-governor for *that* which c-commands *that* and does not c-command *consider*; cf. Rizzi 1990 for details). Thus the prediction of the ECP account seems to be that *that* should be deletable, contrary to fact.

<sup>28</sup> Rizzi 1990:38 expressly proposes that head-government is not satisfied under reconstruction, but the data that motivates that stipulation receives an alternative  
 (continued next page)

are assumed to receive Case under government, but can do so even when they are displaced at S-structure. The ECP account requires the ECP to hold at S-structure, a position which is not uncontroversial (cf. Chomsky 1993, where S-structure conditions are eliminated entirely). My conclusion is that some other account for the failure of IP to be displaced is needed. Such an account is provided in §3.4 below.

### 3.2. The significance of subjecthood

Recall from §1 that a broad notion of entityhood was adopted, one in which properties and propositional contents are entities. If the denotation of a given syntactic constituent is interpreted as an entity in the formal sense, then it should be something that we can talk about, and in particular we should be able to predicate properties of it. Thus we could say that if a string can be interpreted as an entity, it should be a licit subject. Consider the range of syntactic categories that can be syntactic subjects.<sup>29</sup>

- (73) a. DP     [*{John/a dog/every dog}*] barked.  
     b. CP<sub>+FIN</sub> [*That CP subjects exist*] is not universally accepted.  
     c. CP<sub>-FIN</sub> [*For Ralph to read this*] might upset him.  
     d. CP<sub>[PRO]</sub> [*To throw rocks*] is fun.  
     e. VP<sub>ing</sub>    [*Throwing rocks*] costs nothing.  
     f. Acc     [*John tearing sheets*] made me think of Alcatraz.  
     g. SC<sub>PP</sub>    [*Mary in Hawaii*] is something I wasn't prepared for.  
     h. SC<sub>AP</sub>    [*Workers angry about the pay*] is just the situation the ad campaign was designed to avoid.

The abbreviations should be fairly self-explanatory; by CP<sub>[PRO]</sub> I mean the type of infinitival analyzed in GB theory as having a null complementizer and a PRO subject; this will be discussed further below. By Acc I mean the Acc-ing construction; perhaps, this is just a kind of noun phrase, but it might also be a kind of small clause. SC in (73g-h) is small clause, (73h) from Safir 1983, who suggests that small clauses are only licit as subjects in copular constructions; however, I find the following examples good (cf. also Aarts 1992, whence (74c), and Jespersen's example (5b) in §1.1 above, repeated as (74d)).

treatment in §3.4 below.

<sup>29</sup> The point to be made here will, I think, be unaffected if CPs do not appear in subject position, but are coindexed with something that is, as in Koster 1978.

- (74) a. Pigs in the kitchen drives him crazy.  
 b. Biff and Spike arrested spells trouble for the football team.  
 c. Does he fear that Mandela free would pose a greater threat than Mandela behind bars?  
 d. These two difficulties overcome makes the rest easy.

In (74a-b) and in Jespersen's example, the singular agreement shows that the subjects are nexuses and not noun phrases with postmodifiers (as Safir notes). There are some other elements that appear in subject position at least in copular constructions, as shown in (75).

- (75) a. PP<sub>loc</sub> [In the kitchen] is the best place to keep light bulbs.  
 b. PP<sub>temp</sub> [After dinner] might be a good time to play Scrabble.  
 c. PP<sub>man</sub> [With your toes] is a hell of a way to play the piano.  
 d. AdvP [Gently] is the only way to handle a tarantula.  
 e. VP-FIN [Cry foul] is what he does best.  
 f. AP [Proud of your dissertation] is a great way to feel.

I distinguish among locative, temporal, and manner PPs here simply in order to point out that subject PPs are not, as is often assumed, restricted to locative PPs. In the cases in (75), I think, it is difficult if not impossible to construct grammatical examples without the copula.

- (76) a. \* In the basement frightened the children.  
 b. \* After dinner drives him crazy.  
 c. \* With your toes shows you're limber.  
 d. \* Slowly just angered him.  
 e. \* Win makes you arrogant.  
 f. \* Proud can get you fired.

This might be taken to suggest that the examples in (75) involve inversion of a predicate with the subject, and that the subject is in each case the postcopular DP; this sort of construction is modelled in (77a-c). However, as can be seen in (77d-f), the copular inversion structure is incompatible with raising verbs (including modals) and negation (cf. Higgins 1973).

- (77) a. With the senator was a movie star.  
 b. Playing saxophone is Geoff.  
 c. In the kitchen is dessert.  
 d. \* With the senator wasn't a movie star.  
 e. \* Playing saxophone turned out to be Geoff.  
 f. \* In the kitchen might be dessert.

This allows us to test the sentences in (75), and as shown in (78), they turn out to involve non-DP subjects.

- (78) a. In the kitchen turns out to be the best place to keep light bulbs.  
 b. After dinner might be a good time to play Scrabble.  
 c. With your toes seems to be a hell of a way to play the piano.  
 d. Gently isn't the only way to handle a tarantula.  
 e. Cry foul appears to be what he does best.  
 f. Proud of your dissertation doesn't seem like such a strange way to feel.

Thus, although these elements are restricted to equational or identificational-type copular constructions, they really do behave as subjects in that environment. In this they can be contrasted with some other syntactic constituents which cannot occur in subject position at all, not even with the copula. Some are listed in (79) (the bracketed strings all appear as constituents in complement or adjunct positions).

- (79) a. IP<sub>+FIN</sub> \* [IP can't be a subject] is true.  
 b. IP-FIN \* [Max to do the laundry] would be shocking.  
 c. IP-FIN \* [To be intelligent] was seemed by the alien.  
 d. NP \* [Train] would be nice to arrive by.  
 e. VP<sub>+FIN</sub> \* [Likes Mary] is funny.  
 f. SCVP \* [Mary leave] was seen by everyone.  
 g. SC<sub>DP</sub> \* [Sally a genius] was widely considered.  
 h. Adv<sub>T</sub> \* [Quite] would be big enough.

I have included two different infinitival IPs, one with an overt subject, and another contrived so as to have a trace in subject position; it seems that infinitival IP, like finite IP, never occurs as a subject, whether or not that IP contains a subject itself. The impossibility of NP subjects is contingent on the assumption, defended at length in Abney 1987, Stowell 1991b, and Longobardi 1992, that argument noun phrases are always DPs, and if no overt determiner appears there must be a null one; NPs may, however, be predicative, and appear as the complement to the

copula (e.g. *Clinton is president*, cf. *\*President is Clinton*). Finite verb phrases do not actually occur as verbal complements, but they are constituents and occur as complements to Infl; they cannot be subjects, however. In (79f-g) I have included VP small clauses, which appear as the complements to causative and perception verbs, and DP small clauses; these will be discussed at length in Chapter 2 below, where I will suggest that the AP-PP vs. VP-DP distinction suggested by the above examples is not quite right. Finally, I include Adv<sub>T</sub> for 'tertiary adverb,' using tertiary to mean a modifier of a modifier (for Jespersen, VP adverbials were also *tertiaries*). (79h) might be acceptable as a joke, but is not really grammatical.

Depending on one's analysis, the direct object-PP sequence following some verbs is a constituent (e.g. Kayne 1984, Hellan 1988, Larson 1988), as is the indirect object-direct object sequence. However, these constituents, if they are such, can never be subjects.

- (80) a. DO-PP \* [A book to Mary] is rarely given.  
       b. IO-DO \* [Mary a book] is even worse.

Now, it is striking that every constituent that can be a subject can also be displaced in at least some constituency tests. This is demonstrated in (81-82), corresponding to (73) and (75).

- (81) a. DP [Who] did you bark at?  
       b. CP<sub>+FIN</sub> What is strange is [that he didn't recognize us.]  
       c. CP<sub>-FIN</sub> I'd like it very much [for pigs to be in my kitchen].  
       d. CP<sub>[PRO]</sub> It was [to throw rocks] that John liked best.  
       e. VP<sub>ing</sub> She still throws water balloons, but [throwing rocks], she stopped.  
       f. Acc What made me think of Alcatraz was [John tearing sheets].  
       g. SC<sub>PP</sub> [Mary in Hawaii], we weren't prepared for.  
       h. SC<sub>AP</sub> It's [workers angry about the pay] that the executives fear.
- (82) a. PP<sub>loc</sub> [In which room] do you keep the light bulbs?  
       b. PP<sub>temp</sub> [After dinner] they said they might play Scrabble.  
       c. PP<sub>man</sub> [With which toes] do you play the piano?  
       d. AdvP [How gently] must one handle a tarantula?  
       e. VP<sub>-FIN</sub> They said he would cry foul, and [cry foul] he did.  
       f. AP [How proud of yourself] are you?

Other examples can readily be constructed; in most cases, a variety of constituency tests can be successfully applied to the constituent in question. The same constituents and putative constituents that could not be subjects cannot be displaced, as shown in (83-84).

- (83) a. IP<sub>+FIN</sub> \* It is [snakes are mammals] that he doesn't believe.  
       b. IP<sub>-FIN</sub> \* [Max to do the laundry], I would really like.  
       c. IP<sub>-FIN</sub> \* What the alien seemed was [to be intelligent].  
       d. NP \* [How fast bicycle] would you like a?  
       e. VP<sub>+FIN</sub> \* He said he sells turtles, and [sells turtles] he really.  
       f. SC<sub>VP</sub> \* What I saw was [Mary leave].  
       g. SC<sub>DP</sub> \* It was [Sally a genius] that they considered.  
       h. Adv<sub>T</sub> \* How big it was was [quite].
- (84) a. DO-PP \* It was [a book to Mary] that we gave.  
       b. IO-DO \* What we gave was [Mary a book].

The correlation is rather striking. Just the things which cannot have properties predicated of them cannot be displaced.<sup>30</sup> A formal account for this is developed immediately below. I will refer to constituents which can be subjects and can be displaced as INDEPENDENT constituents, while those constituents which are syntactically constituents (as at least those phrases in (83) certainly are) but which cannot be subjects and cannot be displaced and which are not interpreted as basic types as DEPENDENT constituents. Since IPs are always nexuses, and always dependent, non-root IPs are always dependent nexuses (as noted in §1, this is not exactly the same sense in which Jespersen used the term 'dependent nexus').

Notice that coordination must be excluded as a test for dependency, as there is nothing wrong with coordinated IPs, NPs, tensed

<sup>30</sup> As I noted above, Rizzi 1990, based on the contrast between displacement of controlled infinitival such as that in (81d) and raising infinitivals as in (83c), proposed that head-government could not be satisfied under reconstruction. This has the effect that the trace of the subject in the raising infinitival is not properly head-governed and violates the ECP. However, this analysis is problematic; first, it is not clear why head government should not be satisfied under reconstruction. Second, it would rule out the displacement of predicate phrases in general, assuming the Internal Subject Hypothesis, e.g. as in (82e-f); see also Huang 1993, for whom this analysis of Rizzi's was a problem. Here, the distinction is just a part of a more general pattern, in which IP is dependent. An empty CP projection in control infinitivals is independently motivated, since if it did not exist, PRO would be governed. In contrast, the infinitival complement to a raising verb like *seem* must be IP, in order for the trace of the subject not to be ungoverned.

VPs, and so on. This will follow from the account developed below. In addition, Right Node Raising and Gapping do not line up with the above tests;<sup>31</sup> interestingly, both of these problematic constructions involve coordination (and prosody; cf. Swingle 1993). Null complement anaphora, however, does seem to be restricted to independent constituents, though I will not discuss it here.

### 3.3. The Functor Anaphora Constraint

The idea that I will make use of for accounting for the dependency of certain constituents is that an anaphoric element must be of a basic set theoretic *type*; this is essentially the idea behind Chierchia's 1985 FUNCTOR ANAPHORA CONSTRAINT; I state two versions of it in (85) ((85a) is essentially Chierchia's version, from his p. 429).

#### (85) FUNCTOR ANAPHORA CONSTRAINT

- a. Weak: There are no variable-binding mechanisms for third-order functors
- b. Strong: All variables are type e

(85) is a constraint only made possible by an enriched system of types like that proposed in Chierchia 1985 or Chierchia & Turner 1988 (cf. §1.5). The idea is that basic types like type e (entities, including urelements, information units, and nominalized functions) and second-order functors like type  $\langle e, e \rangle$  (predicates)<sup>32</sup> are the kinds of thing that variable-binding mechanisms can operate on, while non-basic types like  $\langle\langle e, \rangle, \langle e, \rangle\rangle$  (adverbial modifiers) and  $\langle\langle e, t, \rangle, \rangle$  (quantifier phrases) are not.<sup>33</sup> In an apparent case of functor anaphora such as *How does John play chess?*, Chierchia suggests that the variable bound in the semantic representation is actually type e; the question corresponds roughly to *What x is such that John plays chess in an x manner?*<sup>34</sup>

<sup>31</sup> That is, neither the 'raised' material in RNR constructions nor the conjuncts must correspond to independently motivated syntactic constituents (cf. Abbott 1976), and similarly neither the missing material nor the conjuncts in Gapping constructions must be syntactic constituents (cf. Hankamer 1971). Of course, there may be non-canonical constituents created by these processes.

<sup>32</sup> Since information units are a sort (sort i) of type e, a function from individual to information units, type  $\langle e, i \rangle$ , is also type  $\langle e, e \rangle$ .

<sup>33</sup> Chierchia & Turner 1988 assign quantified DPs to a basic sort Q. But assuming that QPs bind type e variables, I won't need to make use of the sort Q.

<sup>34</sup> Specifically,  $\lambda p[\neg p \wedge \exists P[p = ^{\text{ly}}(P)(\text{play chess})(j)]]$ , where  $\text{ly}'(P)(Q)(x) = x \in Q$  in a P manner, P ranging over properties.

Given such translation rules, it is tempting to take the stronger position in (85b), namely that all anaphors be restricted to type e. Chierchia 1985:430 suggests that VP anaphora, as in *Ezio hates Pavarotti and Nando does too*, is a case of anaphora of a propositional function (type  $\langle e, t \rangle$ ); but notice that do-support retains the tense of the second conjunct sentence, suggesting that the null complement is not a tensed VP but an infinitival VP; in the system of Chierchia & Turner 1988 an infinitival VP translates as an nf, (nominalized function), a sort of e. It seems, then that (85b) will not rule out any cases of anaphora that we want to allow. The question then becomes, what constituents do not translate as basic types?

Empirically, we know which constituents are dependent (non-displaceable), from §3.2. At the risk of letting the tail wag the dog, I will assume that it is those constituents which translate as non-basic types. Consider, for example, IP. If the Functor Anaphora Constraint is to blame for its dependency, then IP must be a Functor. According to Chierchia and Chierchia & Turner, IP standardly translates as type i, which is basic; but noting (in fn. 14, p. 300) that IP never occurs as a subject, they suggest in passing that "we could say that information units (i.e. propositions) are not individuals but have individual correlates, just like functions. The complementizer might be, then, what maps information units onto their individual correlates." This is exactly the sort of approach that I want to develop here.

Now, in order for the Functor Anaphora Constraint approach to be validated, we must have a well-motivated semantic analysis that assigns basic types to the independent constituents and not to the others. The fact that displaceable constituents appear as subjects is already a partial confirmation of this, in that it suggests that those elements are type e; but the question remains whether analyzing the non-displaceable strings as translating into non-basic types can be justified.

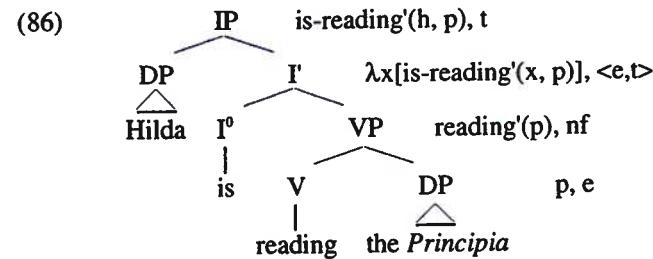
As a first approximation, let us assume that CPs denote propositions, and propositions are sort i (information unit), a sort of type e. Let us assume further that IPs do not translate directly as propositions; if a formula is represented as type t (crucially not a sort of type e), then the complementizer is a function from t to i, viz.  $\langle t, i \rangle$ . Alternatively, we could directly represent the denotation of IP as a functor in the type theory, by positing a type "c" for the contribution of the complementizer; then IP translates as type  $\langle c, i \rangle$ , a mapping from 'c' to information units. But what about the fact that the verb *believe* can appear with a CP or IP complement, and the two are interpreted the same way? One possibility is to assume that *believe* is alternatively type  $\langle i, nf \rangle$  (seeking an information unit (CP) to return a property) or type  $\langle \langle c, i \rangle, nf \rangle$  (seeking

something that's seeking a 'c' in order to become an information unit). This latter type is explicitly ruled out by Chierchia & Turner's first-order theory; it also has a real air of ad-hocity about it, but that might be an artifact of our using type-theoretic notation to represent dependency; equivalently, we could manipulate the rules of semantic interpretation slightly to allow IP-selecting verbs to 'supply' the missing 'c.' This is the approach I will take below, using the notion of head-chains developed above.

The type-theoretic formulation allows a mechanical description of the dependency of IP, but what it lacks is an explanatory, well-motivated notion of what 'c' is and why it is necessary for propositional interpretation. This task is undertaken in §3.4 below.

### 3.4. Some specific cases of Dependency

A very straightforward case of dependency, as conceived here, is the dependency of a transitive verb: the semantic type of the translation of a transitive verb will be  $\langle e, nf \rangle$ , a non-basic type in the relevant sense. No element which translates as type  $\langle e, nf \rangle$  should be able to enter into an anaphoric relation, given the Strong FAC proposed above. Consider a sample translation of a sentence containing a transitive verb, *Hilda is reading the Principia*; assume for the moment that IP translates as something of type  $t$  (the correct translation of IP will be the topic of §3.4.2).



To the right of each branching node is a semantic translation provided by the mapping rules, followed by the semantic type of the constituent.<sup>35</sup>

<sup>35</sup> To be fully explicit, I am assuming for the moment the following translations:

*Hilda* translates into  $h$ , a constant of type  $e$ .

*the Principia* translates into  $p$ , a constant of type  $e$ .

*reading* translates into  $\lambda x[\text{reading}'(x)]$ , a functor of type  $\langle e, nf \rangle$ .

*is* translates into  $\lambda x\lambda y[\text{is-}x(y)]$ , a functor of type  $\langle nf, \langle e, t \rangle \rangle$ .

$P(x)(y)$  is rewritten  $P(y, x)$ .

The noun phrase *the Principia* translates as ' $p$ ', which is type  $e$ . The verb phrase *reading the Principia* translates as '*reading'(p)*', which is type  $nf$ . Infl is a predicator, of type  $\langle nf, \langle e, t \rangle \rangle$ , so the Infl translates as type  $\langle e, t \rangle$  (I have simplified the syntactic structure by representing *is* as base-generated in Infl; it could be represented as raising from a VP layer without compromising the point at hand). I have represented the denotation of the VP as a saturated one-place predicate, with the subject argument place (represented by the variable  $x$  in the denotation of the Infl) introduced by the predicator (*is* in (86)). Such details are not crucial. What is important is that the VP is type  $nf$ , a basic type. The FAC does not prevent displacement of the VP, and in fact the VP can be displaced, as indicated in (87a-c); it can also serve as a subject, as in (87d). Example (88) is included as a reminder that participial VPs in general are displaceable, although the perfect participle in English is recalcitrant (and so the translation is marginal; cf. §3.1).

- (87) a. *Reading the Principia* though she might be, she'll never find that passage.  
 b. What she was doing was reading the *Principia*.  
 c. She said she'd be reading the *Principia*, and reading the *Principia* she was.  
 d. Reading the *Principia* might persuade her to change her mind.

- (88) Lest *Principiaen* har Hilde ikke. (Nor)  
*read the. Principia has Hilde not*  
*'Read the Principia, Hilde has not.'*

The claim is that each of the constructions in (87a-c) involves an anaphoric relation of some sort involving the VP *reading the Principia*. For example, in (87b), the displaced VP is arguably anaphorically linked with the verb *doing*; in (87c), the displaced VP is linked with a trace. All this is possible because *reading the Principia* translates into a basic type.

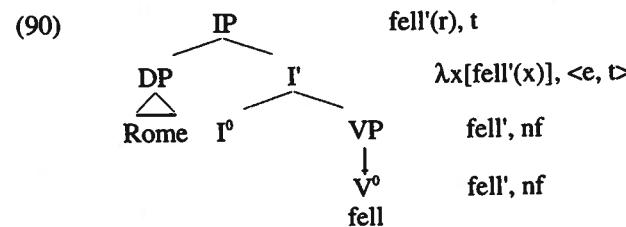
The verb *read* is optionally transitive; thus, an example like (89a) is acceptable, where *reading* is understood as intransitive and is interpreted as something of sort  $nf$ . The verb *replace*, on the other hand, is obligatorily transitive; it is always type  $\langle e, nf \rangle$ . Therefore, (89b) is ungrammatical. Example (89c), of course, is acceptable, as *replacing* appears with a direct object, and the whole is sort  $nf$ .

- (89) a. Reading is fun.  
 b. \* Replacing is fun.  
 c. Replacing his mineral water with vodka was fun.

Some questions remain; for example, does head-movement create an anaphoric relation (the relation of the head with its trace), and if so, how does the movement of a transitive verb (e.g. in Norwegian V to C movement) satisfy the FAC? Another question has to do with the interpretation of tensed VPs; given the suggestion in §3.2 (cf. also Chierchia 1985) that tensed VPs are dependent, they must not translate as sort nf. How, then, do they translate? I will attempt to provide an answer to this last question below, but first I will approach the question of the dependency of IP. As for the question regarding head-movement, I offer only some speculative remarks, also below.

#### 3.4.1. The dependency of VP

As noted above, tensed VPs are dependent. This means, on the current approach, that they do not translate into entities. In the translation in (86) above, I represented the auxiliary verb as occupying the Infl position, and interpreted it as if it were Pred (cf. §1.1.5). But in the absence of an auxiliary, Infl is unoccupied. Thus a similar translation scheme for the sentence *Rome fell* runs as in (90).<sup>36</sup>



This gives us a VP that translates as an nf, a sort of type e; hence there is no explanation for the dependency of the VP (and the badness of \**What Rome did was fell*). But there is reason to believe that correct translation of the verb is not as given in (90). The translation in (90) completely ignores the morphological form of the verb, and translates *fell* into *fell*, just as the translation in (86) gave  $\lambda x[\text{reading}'(x)]$  as the translation of *reading*. Obviously, this glosses over the semantics of tense and aspect. Let us instead assume a semantics for the different inflectional forms, and encode this in the translation. Let the morphological form of a verb be represented as a feature specification on the verb, which we might

<sup>36</sup> Specifically:

*Rome* translates into r, a constant of type e.

*fell* translates into fell', a constant of type nf.

$\text{ʃ}^0$  translates into  $\lambda x\lambda y[x(y)]$ , a functor of type <nf, <e, t>>.

abbreviate VFFORM (following Gazdar et al. 1985), thus a progressive participle like *reading* is represented as *reading*[VFFORM: Prog], and a past tense form like *fell* can be represented as *fell*[VFFORM: Past]. VFFORM values can be assigned semantic values as type-preserving functions over verb stems, so that the argument structure of the verb stem can determine the semantic type of the inflected verb. This is stated as a rule in (91).

#### (91) Verb translation rule

If C is a verb with stem B and VFFORM value A, and the translation of B is  $\beta$ , type  $\delta$ , and the translation of A is  $\alpha$ , then the translation of C is  $\alpha(\beta)$ , type  $\delta$ .

The translation of *fell*[VFFORM: Past] is now Past(fall'), or Past-fall'. Of course, this translation rule is largely devoid of content unless the semantic values for  $\alpha$  and  $\beta$  are specified. For an idea of how the values for  $\alpha$  might appear, I refer the reader to Dowty 1979. The values for  $\beta$  must be determined on a verb-by-verb basis.

Now consider the fact that two VFFORM values in particular are closely tied to the Infl node, namely the Tense values Present and Past; in Chomsky 1991, Tense lowers from Infl to V, and in Chomsky 1993, V raises to Infl (at LF) to check its Tense feature. In fact, we can provide a semantic motivation for this close connection between Infl and the tensed verb. Unlike the participles, the full translation of a tensed verb makes reference to a point in time with respect to which the clause is evaluated. The meaning of the operators associated with the participles have to do with different aspectual organizations of the event referred to, but the meaning of the tense operator has to do with the relation between the time of utterance (Reichenbach's 1947 S, for POINT OF SPEECH) and the time of what is being described (Reichenbach's R, for POINT OF REFERENCE). Put simply, the meaning of the present tense is something like 'there is some R equal to S at which...', while the meaning of the past tense is something like 'there is some R prior to S at which...'. A more formal representation of the tense values is given in (92), using restricted quantifiers; t is a variable over points of time, the subscripts correspond to Reichenbach's terms, and ' $<$ ' indicates the relation 'precedes' (see Dowty 1979 for formulations similar to those in (92)).

- (92) a. Pres:  $\exists t_r: t_r = t_s$

- b. Past:  $\exists t_r: t_r < t_s$

Now, the full translation of *fell*[VFFORM: Past] is  $\exists t_r: t_r < t_s$ [fall']. This representation is clearly missing something: there is no variable bound by the quantifier (cf. Chomsky's 1986b discussion of the absence of vacuous quantification in natural language). We could insert a time-variable in the

representation of the verb by caveat. Alternatively, we could allow this variable to be introduced by Pred. Setting that question aside for a moment, note that the value of  $t_s$  is not always directly determined by the time of the utterance of the sentence. Consider the sentences in (93).

- (93) a. Juliet said Romeo was in her room.  
       b. Juliet will say Romeo was in her room.

In the embedded clauses in (93), the past tense picks out a time not prior to utterance of the sentence as a whole, but prior to the time of Juliet's reported (or predicted) utterance. That is to say, (93) is a true prediction on Monday if it comes to pass that Juliet says on Wednesday that Romeo spent Tuesday in her boudoir. This suggests that  $t_s$  may be specified for each IP; but it will be specified by factors external to the tense-inflected verb itself (i.e. the root context, or the embedding verb, or perhaps some other factors). In this sense, the interpretation of the Tense morphemes is connected to the higher structure in a way that the interpretation of the aspectual inflections is not. Compare the progressive participle in some different contexts in (94).

- (94) a. Romeo is humming a tune.  
       b. Romeo was humming a tune.  
       c. Romeo has been humming a tune.  
       d. Juliet will say that Romeo was humming a tune.

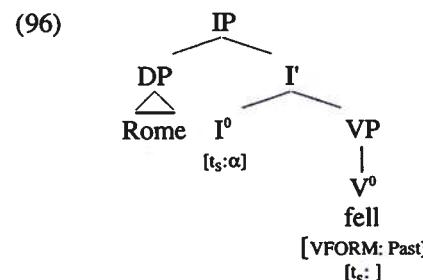
The progressive aspect has the effect that the humming event is treated as covering an interval (cf. Dowty 1979), and may or may not be completed (in Reichenbach's terms, we might say that E spans an interval and is possibly unfinished, and R is located within E). This interpretation remains the same in all of the various contexts in (94), indicating that the interpretation of the progressive is not affected by feature specifications in the higher structure. The same thing can be demonstrated for the perfect participle.

Thus, there is semantic evidence that Tense is connected to the higher structure in a way that non-tensed inflectional values are not. Following this intuition, let us say that a tensed verb does not actually have a VFORM value in the sense relevant to the translation rules in (91), until the value for  $t_s$  is specified. This can be stated formally as in (95). (95) is not intended to be a special rule of translation, just a refinement of the special case of (91) instantiated by the values of  $\alpha$  represented in (92).

(95) Verb translation rules for tensed verbs

- a. If C is a verb with stem B, VFORM value Pres, and  $t_s$  value  $\epsilon$  and the translation of B is  $\beta$ , type  $\delta$ , then the translation of C is  $\exists t_r: t_r = \epsilon[\beta(t_r)]$ , type  $\delta$ .
- b. If C is a verb with stem B, VFORM value Past, and  $t_s$  value  $\epsilon$  and the translation of B is  $\beta$ , type  $\delta$ , then the translation of C is  $\exists t_r: t_r < \epsilon[\beta(t_r)]$ , type  $\delta$ .

We can assume for the moment that  $t_s$  values are base-generated in Infl, and a tensed verb must be specified for those values during the course of the derivation. In this case, the base-generated structure for the sentence *Rome fell* is not as in (90) above, but as in (96) below.

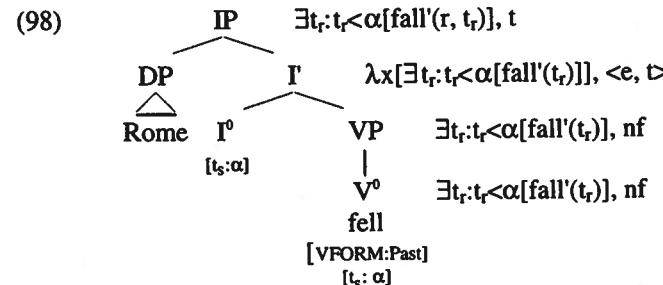


Here, the verb is not specified for the feature  $t_s$ . The rules in (91) are unable to assign a semantic translation to it, because the value for the Past morpheme is incomplete; *fall* simply does not translate in this structure. However, there is a mechanism by which we can specify a value for the feature  $t_s$  on the in the structure in (96). Recall the conditions on head-chains from (60) in §2.2, restated here in (97).

(97) Conditions on head-chains:

- a. An ordered n-tuple of heads  $\langle \alpha_1, \dots, \alpha_n \rangle$  is a head-chain only if, for every  $i$ ,  $1 \leq i < n$ ,  $\alpha_i$  is local to  $\alpha_{i+1}$ ;  $\alpha_1$  is the INITIAL of the head-chain and  $\alpha_n$  is the TERMINUS of the head-chain.
- b. A head-chain H is an F-chain, for any feature F, iff:
  - i. all members of H bear the feature F,
  - ii. the initial of H has a value specified for F, and
  - iii. no non-initial member of H has a value specified for F.
- c. In an F-chain, the terminus inherits the initial's specification for F.

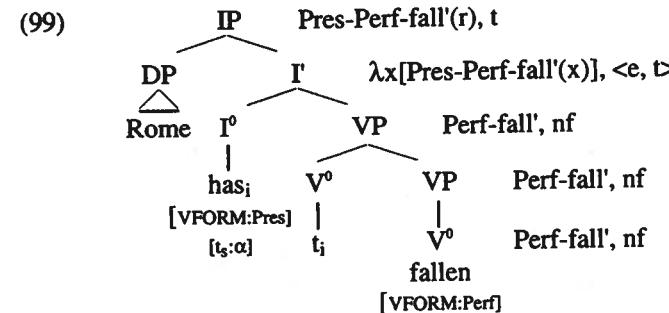
A head-chain can then be formed between Infl and the verb, creating the tree in (98). The translation rules apply as desired.



This idea could be refined in various ways, for example the  $t_r$  variable could be equated with Davidson's 1969 event argument, and could be assumed to be part of the argument structure of the verb. The main idea which needs to be preserved for my account of dependency is that a tensed verb, but not a participle, must enter into a head-chain with the verb in order to have its Tense feature licensed or checked. If this licensing or checking does not occur, the verb fails to receive a proper translation.

Now consider in what sense this accounts for dependency of a tensed VP. The VP actually translates as something of type nf, so it may appear that we are back where we started. But crucially, it receives this translation only by virtue of a feature specification that it got via a head-chain. In a displaced context, the head-chain could not be formed, and the VP would remain uninterpretable.

Now compare a structure with an auxiliary verb, diagrammed in (99).



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Here I simply represent the VFORM values as unanalyzed prefixes (or functions) in the logical representation. I represent *has* as having raised from a verb node to Infl. Here, its feature specifications are unified with those of Infl, and it is specified as  $[t_s:α]$ . This specification allows the translation of the present tense morpheme, and the translation proceeds as shown. Alternatively, *has* might be interpreted in its base-position,  $t_i$  in (99). This could be seen as a special case of a head-chain passing feature specifications down to a lower head, except in this case the head-chain would be passing all of the values for some feature like HEAD or CONTENT.<sup>37</sup> What is more relevant to present concerns is the observation that the lower VP in (99) is independent. Its translation as an entity of sort nf is not licensed by any head-chain or movement operation, and any hindrance to its displacement must be due to factors other than dependency.

### 3.4.2. The dependency of IP

As noted above, a CP is not dependent, and therefore must denote a kind of entity (specifically, an information unit). If a verb takes a CP as its complement, then that verb must denote a relation between individuals and information units. But many such verbs also admit IP complements, and I claimed above that the dependency of IP indicated that it does not translate as a kind of entity. How can IP be a complement to a belief verb? In this subsection I develop an account for this. The basic intuition is that an information unit consists of a proposition plus an ANCHOR, which specifies the context in which the proposition is to be evaluated. An IP by itself may denote a proposition (or a formula, the extension of a proposition), but does not ordinarily denote an information unit. A complementizer supplies an anchoring which allows a CP to be interpreted as an information unit. When an IP is embedded under an epistemic verb, however, it is possible for the verb to supply an anchoring which allows the IP to be interpreted as an information unit. The IP is dependent in the sense that it requires some higher element to supply an anchor. Without the anchor, it is interpreted only as a formula, which is incoherent in an embedded context. In order to develop this account, I first adopt a general framework for discussing the content and context of propositions.

In Montague grammar, a simple declarative sentence can be translated into a formula, which can be seen as a mapping from

<sup>37</sup> I.e., if the trace bears some feature like HEAD and all of the information necessary for interpretation is encoded in feature-specifications which constitute values for the feature HEAD.

circumstances to truth values. The truth value of the sentence in a given circumstance is its extension; the set of all the possible circumstances in which the sentence is true is its intension. It is common to model circumstances as possible worlds, where a world consists of a variety of individuals with various and in various relations to each other (I am ignoring time for the moment). The utterance of such a sentence is typically interpreted as expressing an assertion on the part of the speaker that the formula accurately characterizes the real world, in the context of that utterance. Even ignoring Gricean pragmatic issues, the belief, knowledge, and attitude of the speaker as well as the context of utterance are crucial in evaluating the truth of a simple declarative sentence. For example, the speaker's association of referents to pronouns may affect truth conditions, and so may the immediate physical context of the utterance, for example when various deictic terms are used. In a broader sense, the context of the utterance also includes various tacit agreements between the speaker and the hearer, for example the familiarity of various individuals and the domain of quantification (cf. Karttunen 1973).

Following Stalnaker 1974 and 1978, we can speak of the COMMON GROUND of an utterance, the set of propositions that both the speaker and hearer take for granted. If propositions are the intensions of sentences, then the common ground is a set of sets of possible worlds. Each assertion made during a conversation is added to the common ground, if it is not challenged or retracted. Still following Stalnaker, the intersection of all the propositions in the common ground is the CONTEXT SET (a set of possible worlds, hence a proposition). This is the set of possible worlds that the speaker and hearer consider, for the purposes of the conversation, to be viable realities, i.e. it is assumed that the real world is in the context set. The context set must not be empty, so contradictory assertions cannot be accepted.

This model of discourse gives us a way to describe what happens when a participant in a conversation utters a simple declarative sentence. A sentence  $P$  may be translated as a set  $\phi$  of possible worlds, but the speaker is not simply naming that set. The speaker, in stating  $P$ , adds  $\phi$  to the common ground, which amounts to a proposal that all worlds incompatible with  $\phi$  be removed from the context set. This can be stated as in (100).

(100) If a speaker asserts  $\phi$  and the common ground is  $c$ ,  $\phi$  is added to  $c$ .  
 (100) represents the basic case. More complicated circumstances will be addressed below. This model allows a simple treatment of presupposition (see Chierchia & McConnell-Ginet 1990, Chapter 6, for discussion); when a proposition  $\phi$  presupposes a proposition  $\psi$ , this means that there

is a condition on the felicitous utterance of  $\phi$  that the context set be contained within  $\psi$ , i.e.  $\psi$  must be in the common ground.

In addition, this model provides a useful tool for the evaluation of statements about different individuals' beliefs. As participants in a discourse, we generally assume that everyone believes everything they say; anyone of whom this is not true is a liar. As long as we believe everything that a speaker says, that speaker's utterances are added to the common ground. But if we differ, then we know that there is a difference between what we believe and what that person believes. We can model this, when it is relevant, by keeping track of another set of propositions alongside the common ground, namely the belief-set of each participant in the discourse. Thus (100) above can be modified as in (101) below.

(101) If a speaker  $x$  asserts  $\phi$  when the common ground is  $c$  and  $x$ 's belief-set is  $b$ ,  $\phi$  is added to  $c$  and to  $b$ .

Now it is also assumed, in a typical conversation, that listeners believe what the speakers say, if they do not object to it. This could be added as well to (101). But consider what happens if the speaker,  $x$ , says something to which a hearer,  $y$ , objects.  $Y$  might allow the contentious assertion to be added to the common ground anyway, for the purposes of the conversation. Or  $y$  might challenge the validity of the assertion, for example by saying, "I don't believe that." Now, a more complicated thing happens.  $Y$  has made an assertion, which, assuming that all of the participants in the discourse believe it, is added to the common ground, in accordance with (101). But in addition, the previous proposition is removed from  $y$ 's belief-set, or its negation is added. All things being equal, a participant's beliefs can be assumed to be a superset of the context set; but as soon as some claim is made about belief, a difference will be established between the context set and the individual's belief.

Thus an individual's beliefs can be modelled as a proposition, the intersection of all of the propositions in the belief-set.<sup>38</sup> This requires that individuals not hold contradictory beliefs, which has of course been challenged, but I will nonetheless assume it to be true. Another issue that arises is whether individuals must believe all of the entailments of their beliefs. In general this must be the case, so I will assume that in general, when reasoning about the belief-set of an individual  $x$ , if that set contains  $\phi$ , and  $\phi$  entails  $\psi$ , then  $x$ 's belief-set also contains  $\psi$ , provided that  $x$  has

<sup>38</sup> Note that this allows intensional contexts within beliefs. Thus, an individual who believes that Norway might be part of Sweden has as an object of belief a set of worlds, in some of which Norway is part of Sweden and in some of which Norway is not a part of Sweden.

a proper understanding of all of the component parts of the sentence translated as  $\psi$ . In the vast majority of cases, this seems to produce the desired results. If Mary believes that she has a sister, then Mary believes that she has a sibling, provided she understands the concept of sibling, because the proposition *Mary has a sister* entails (is a proper subset of) the proposition *Mary has a sibling*.

There are certain well-known problems for this view. The most often cited one is that of necessary truths, for example mathematical truths: if Mary has a few basic mathematical beliefs, then this view seems to entail that she has much more complex ones as well. Say, for example, that she knows something about negative numbers. She believes that  $2+(-2)=0$ . Can we infer that she believes that  $2-(-2)=4$ ? Apparently not. But upon discovering that she rejects the second equation, we are inclined to patiently explain that she is wrong. If successful, we manage to show her that she holds inconsistent beliefs about  $-2$ ; there are many propositions in her belief-set, but their intersection is empty.

Chierchia & McConnell-Ginet 1990 point out a slightly different sort of problem. In their example, Mary believes that everyone ate chicken, but she hasn't considered the possibility that anyone ate tofu. She might not even know that tofu exists. It does not seem that we can fairly assert that she believes that nobody ate tofu; but nor can we say that she holds contradictory beliefs. The intersection of her belief-set contains no worlds in which anyone ate anything other than chicken, but it might not contain tofu at all. In other words, Mary has no beliefs at all regarding tofu. This is different from a situation in which John understands the concept of tofu, but doesn't believe that it exists. In such a case, his belief also contains no worlds in which people ate tofu, but it does contain some worlds in which there is tofu (perhaps imagined worlds, or dream worlds). One way to capture this distinction would be to posit a notion of accessibility (worlds in which people ate tofu are accessible to John, but not to Mary), but I will not attempt to do so. Instead I will simply assume that for the purpose of evaluating the truth-conditions of statements about belief, individual's beliefs can be modelled as sets of propositions which have a non-null intersection. An individual whose belief-set is discovered to have a null intersection can rightly be accused of inconsistency.<sup>39</sup>

<sup>39</sup> Here I disagree with, for example, Katz 1986, who argues that people can knowingly believe contradictory things; he suggests that there are "...Christians who believe God's creation to contain unnecessary and undeserved suffering and who see this as entailing that God cannot be both all good and all powerful but who still believe God to be both." (Katz 1986:66). My suspicion is that the Christians in question would challenge the entailment, although I suppose that's an empirical

(continued next page)

Adapting the notation of Farkas 1992b, let us represent a set of possible worlds as  $w$ ; the context set is  $w_R$  ( $R$  for 'real,' as  $w_R$  is assumed for the purposes of the discourse to contain the "real world"). The set of propositions that we take an individual to believe is that individual's belief-set, and the intersection of  $x$ 's belief-set is  $w_b(x)$ . Say that a sentence  $P$  translates into a proposition  $\phi$ . If uttered in the context  $w_R$ , then the complete information unit represented by  $P$  in that context can be modelled in the following way:  $A(w_R, \phi)$ , where  $A$  signifies 'assert,' and the proposition is added to the anchor (various other notations could be adopted, for example the context could be made into a superscript, or the context and the proposition could be represented as an ordered pair). There are also other modes of anchoring, for example 'presuppose,' which could be represented as  $\Pi(w_R, \phi)$  when  $\phi$  is presupposed in  $w_R$ .<sup>40</sup> The context of a proposition embedded under a belief-predicate is  $w_b(x)$ , where  $x$  is the subject of the belief-predicate. I will speak of an asserted proposition as being anchored to a particular context, and I will speak of the context as the anchor of the asserted proposition (this is somewhat different from Farkas' use of the same terms; for Farkas, the anchor of  $w_b(x)$  is  $x$ ; for me, the anchor of  $A(w_b(x), \phi)$  is  $w_b(x)$ ). If a proposition is an assertion, then it is added to the common ground, from which  $w_R$  is calculated; I will describe this more loosely by saying that a proposition is added to its anchor, i.e.  $\phi$  is added to  $w_R$ . Thus, presented with an information unit of the form  $A(\alpha, \beta)$ , we can say that  $\beta$  is added to  $\alpha$  (more precisely,  $\beta$  is added to the set from which  $\alpha$  is calculated). Propositions can be mapped onto information units by rules of translation. For example, we can state one such rule as in (102).

(102) Root Rule:

If  $P$  is an root indicative declarative sentence uttered by  $x$ , and the intension of  $P$  is  $\phi$ , and the context set at the time of utterance is  $w_R$ , then  $P$  translates into  $A(w_R, \phi) \wedge A(w_b(x), \phi)$ .

The Root rule anchors the intension of the root IP to the context set ( $w_R$ , the intersection of all the previous assertions in the discourse, plus various entailments of those assertions, plus various other salient propositions that I can safely assume are believed by my audience) and

question.

<sup>40</sup> The modes of anchoring  $A$  and  $\Pi$  might be extended to definite and indefinite noun phrases; an indefinite noun phrase would be anchored with  $A$ , meaning that its referent should be added to the domain, while a definite noun phrase would be anchored with  $\Pi$ , meaning that there is a felicity condition on its use that its referent already be in the domain.

the belief-set of the speaker. IPs in other contexts will receive their anchoring in different ways. Consider the interpretation of a finite CP in a subject position, as in (103).

- (103) a. That senators take bribes disturbs me.
- b. That Jason has made cookies makes sense.

Kiparsky & Kiparsky 1970 point out that *that* CPs in subject position are generally factive, that is, their truth is presupposed. As a first approximation of the meaning of the complementizer *that*, suppose that it has the function of anchoring the content of the IP to  $w_R$ . The anchoring takes the form of a presupposition, rather than an assertion; in other words, the relevant proposition is not added to the context set, it is merely checked against the context set for compatibility. In a sense this makes *that* like the determiner *the*, which has the effect that the entity denoted by the DP is presupposed to be in the domain of discourse (cf. Bresnan's 1972 observation that the complementizer *that* is 'definite'). This can be represented as in (104).

(104) Complementizer rule:

If P is an IP, and the intension of P is  $\phi$ , and the context set at the time of utterance is  $w_R$ , and P is the complement of the complementizer *that* heading a non-complement CP Q, then Q translates into  $\Pi(w_R, \phi)$ .

Of course, when *that* CPs appear as the complements to certain verbs, they are not factive. Just as with IPs, when *that* CPs are embedded under epistemic verbs, the verb determines not only the world the proposition is anchored to, but also the type of anchoring. The examples in (105) show finite CPs interpreted non-factively; their truth is not presupposed.<sup>41</sup>

<sup>41</sup> Kiparsky & Kiparsky 1970:167 note that CPs in subject position tend to be interpreted factively, even when they are logically the complements of non-factive verbs; they give the pair in [i].

- [i] a. That Smith had arrived was reported by the UPI.
- b. It was reported by the UPI that Smith had arrived.

I agree with their observation that the CP in [ia] is most naturally interpreted as factive, while the same CP in [ib] is not. However, the correlation does not seem to be absolute. I think that the sentences in [ii] are possible, without any presupposition of the truth of the CP.

- [ii] a. That the earth is flat was widely believed until recently.
- b. That Clinton will run for re-election is likely.

- (105) a. It was reported by the UPI that most senators take bribes.
- b. Chris claims that Jason has made cookies.

Thus, if I state *Jack believes Max is afraid of spiders*, the whole proposition is anchored to the context set . The embedded proposition *Max is afraid of spiders* is anchored to Jack's belief-world,  $w_b(j)$ . There are also fictitious worlds, for example the world of a dream; *Zack dreamt there were bees in his hair* anchors the proposition *there were bees in his hair* to  $w_d(z)$ , Zack's dream-world. Note that the anchoring is not the whole of the content of the verb; *Jack doubts Max is afraid of spiders* anchors *Max is afraid of spiders* to  $w_b(j)$ , but not in the same way as *believe* does.<sup>42</sup>

The function of *that*, then, is not simply to anchor the intension of the IP,  $\phi$ , to  $w_R$ , but to anchor  $\phi$  to some  $w$ ; a verb of propositional attitude can determine what  $w \phi$  is anchored to (and how), or  $w_R$  can be assumed by default if the CP is not embedded under an epistemic verb. A couple of verb-specific anchoring rules are given in (106).

- (106) Anchoring: If P is an IP, and the intension of P is  $\phi$ , and the context set at the time of utterance is  $w_R$ , then:

- i. Belief: if P is the complement of the complementizer *that* heading a CP Q which is the complement of *believe*, and x is the subject of *believe*, then Q translates into  $A(w_b(x), \phi)$ .
- ii. Dream: if P is the complement of the complementizer *that* heading a CP Q which is the complement of *dream*, and x is the subject of *dream*, then Q translates into  $A(w_d(x), \phi)$ .

Some regular rules apply to the common ground, all belief-sets and all dream-sets: if a proposition is added to the common ground, then a new context set is calculated from the new common ground. Similarly, if a proposition is added to x's belief-set, a new  $w_b(x)$  is calculated. Belief and dreaming are different in that individuals are assumed to have one  $w_b$ , while they may have as many  $w_d$ 's as they have dreams. The extension of this pattern to other verbs is fairly obvious; there can be a claim-set, the set of propositions an individual claims (in a given setting; if I say that Frank told Sally one thing and me another, then I must posit two different claim-sets for Frank). As long as it is assumed that individuals are not lying, propositions added to their claim-sets will also be added to their belief-sets. All verbs of saying can be assumed to

<sup>42</sup> More 'modes of anchoring' might be introduced to encode this variation; for example, if  $A(\alpha, \beta)$  means 'add  $\beta$  to  $\alpha$ ', then  $\Delta(\alpha, \beta)$  might mean 'remove  $\beta$  from  $\alpha$ ', to capture the difference between, say, *believe* and *disbelieve*, or *claim* and *deny*.

contribute to claim-sets (*deny* would subtract its complement proposition from the claim-set, or contribute its negation); all verbs of belief would contribute to the belief-set (*know* includes a presupposition that the context set is contained in the complement proposition). *Imagine* is like *dream* in that multiple imagination-sets can readily be produced, there being no expectation that the different things an individual imagines be consistent. Thus, the representation of information units as pairs of propositions and anchors plus a mode of anchoring is completely general; the specific way in which a proposition is connected to its anchor is determined by the embedding verb or the Root Rule or the Complementizer Rule. Obviously, more rules are needed. Presupposed propositions can be added to the common ground by accommodation, if they are not considered controversial or surprising. Assertions which go unchallenged are typically added to the hearer's belief-set as well. But the rules in (106) give a general idea of the utility of contexts in calculating truth-values. However, I will improve on these rules below, using more general mechanisms already available.

Now, I established in §3.3 that the dependency of IP could be characterized by saying that IP lacks something which I called "c", the semantic contribution supplied by the complementizer. Let us say now that the semantic contribution of the complementizer is the anchoring itself. This can be formalized in the following way. Say that the property of being potentially modally anchored is represented by a feature  $\omega$ , just as the property of being potentially assigned Case is represented by the feature Case; then all elements that can potentially be modally anchored must bear the feature  $\omega$ . Values for the feature  $\omega$  are pairs consisting of a mode of anchoring and an anchor. An IP with an intension  $\phi$  and a  $\omega$  specification  $\langle A, w_R \rangle$  will be translated as the information unit  $A(w_R, \phi)$ . Since one proposition might have more than one anchor, we can allow the value of  $\omega$  to be a set of ordered pairs. This is encoded in the rule stated in (107).

- (107) If an IP P has intension  $\phi$  and a  $\omega$  value consisting of pairs of the form  $\langle \alpha, \beta \rangle$ , then P is an information unit of the form  $\alpha(\beta, \phi)$  (for each  $\alpha$  and  $\beta$ ).

Now we can restate the Root Rule from (102) above as in (108) below.

(108) Root Rule:

If P is a root indicative declarative sentence uttered by x, and the context set at the time of utterance is  $w_R$ , then specify the  $\omega$  value of P as  $\{ \langle A, w_R \rangle, \langle A, w_b(x) \rangle \}$ .

The Root Rule specifies the anchoring for a root IP, and (107) applies to any IP with a specified  $\omega$  value. Now we can also restate the Complementizer rule from (104) above as in (109) below.

- (109) Complementizer rule:  
*that* has  $\omega$  value  $\langle \Pi, w_R \rangle$ .

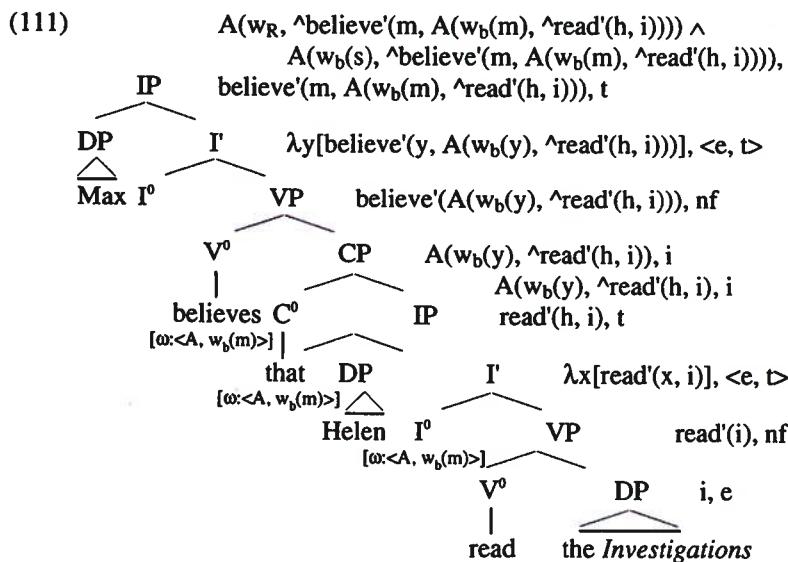
Now, if we assume that Infl is base-generated with a  $\omega$  feature with an unspecified value, an IP embedded under the complementizer that will not be interpretable as an information unit, unless it forms a head-chain with the complementizer and receives the complementizer's  $\omega$  feature specification. Once Infl bears a  $\omega$  feature, the IP is specified for  $\omega$  (assuming that  $\omega$  is a head feature in the sense of e.g. Gazdar et al. 1985) and the rule in (107) will assign it a licit translation as an information unit. This takes care of cases where the complementizer contributes a presuppositional anchoring.

Now consider the case where a CP is embedded under an epistemic verb. We can assume that each epistemic verb bears a  $\omega$  feature specification. When CP is embedded under an epistemic verb, we want to copy the verb's value for  $\omega$  onto the complementizer, and then onto the embedded Infl. However, recall from §2.2 that all non-initial members of an F-chain must bear F but be unspecified for it. This means that the complementizer *that*, when embedded under an epistemic verb, must bear an unspecified  $\omega$ ; in other words, (109) must be constrained to act as a default rule, only applying when no other value is available.

The initial representation of a sentence like (110a), prior to head-chain formation, might be something like that in (110b), ignoring the  $\omega$  feature on the main clause Infl.

- (110) a. Max believes that Helen read the *Investigations*.  
 b. Max believes<sub>[ $\omega$ : $\langle A, w_b(m) \rangle$ ] [CP that<sub>[ $\omega$ ] [IP Helen [r<sub>[ $\omega$ ] ] read the *Investigations*]]]  
 c. Max believes<sub>[ $\omega$ : $\langle A, w_b(m) \rangle$ ] [CP that<sub>[ $\omega$ : $\langle A, w_b(m) \rangle$ ] [IP Helen [r<sub>[ $\omega$ : $\langle A, w_b(m) \rangle$ ] ] read the *Investigations*]]]</sub></sub></sub></sub></sub></sub>

In (110b), a head-chain has been formed which consists of the epistemic verb, the complementizer, and the embedded Infl; the complementizer and Infl inherit the  $\omega$  feature value of the epistemic verb, and the IP is interpreted as an anchored proposition, i.e. an information unit. Consider a step-by-step translation of (110), given in (111) (ignoring tense in order to simplify the representations).

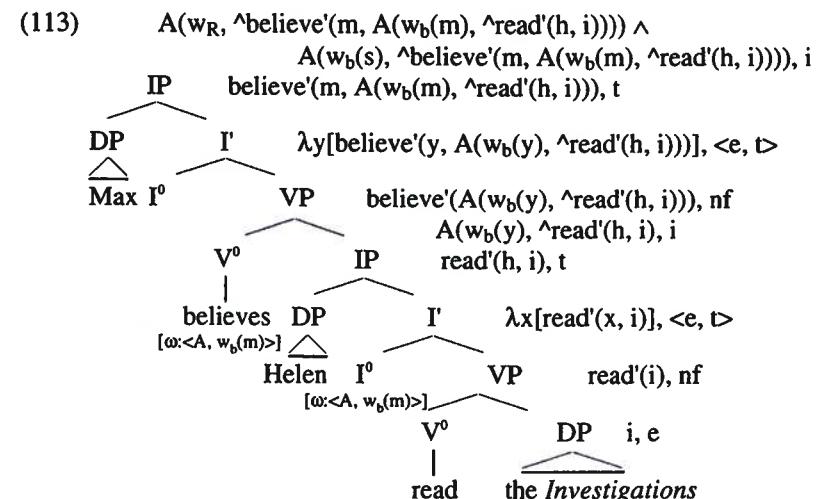


The translation proceeds from the bottom up. The components of the embedded IP yield the formula  $\text{read}'(h, i)$ , which is type  $t$ , but since the IP has the feature specification  $[\omega:<A, w_b(m)>]$ , the formula is mapped onto the information unit  $A(w_b(y), \wedge\text{read}'(h, i))$ , which is type  $i$ . The Root Rule specifies the  $\omega$  value on the root Infl (not shown). When the root IP is composed, rule (107) gives the information unit given on the first two lines, and the proposition is added to the context set and to the speaker's belief-set (the speaker is indicated with 's'). The role of *that* is really just to pass along the value for  $\omega$ . The rules in (106) can now be completely replaced by some lexical specifications of the  $\omega$  values for the various epistemic verbs.

The case of the bare IP complement to an epistemic verb now follows directly from what has already been said. Consider the representation in (112). There, *believe* is fully specified as it was in (110b) above. The complement of *believe* is an IP, specified exactly as the embedded IP in (110b) was specified. In (112c), the head-chain is shorter, including only the verb *believe* and the embedded Infl, but the effect is the same; the embedded IP will be translated as an information unit.

- (112) a. Max believes that Helen read the *Investigations*.  
 b. Max believes $[\omega:<A, w_b(m)>]$  [IP Helen [ $I^0[\omega]$ ] read the *Investigations*]  
 c. Max believes $[\omega:<A, w_b(m)>]$  [IP Helen [ $I^0[\omega:<A, w_b(m)>]$ ] read the *Investigations*]

The translation of (112) proceeds as in (113).



What, then, is the function of the complementizer *that*? Consider briefly what happens in structures with displaced CPs and IPs. The sentence in (114a) is represented in (114b-c).

- (114) a. That Max is afraid of spiders, Jack believes.  
 b. [cp That $[\omega]$  [IP Max [ $I^0[\omega]$ ] is afraid of spiders]] $_i$ , Jack  
 believes $[\omega:<A, w_b(j)>]$   $t_i$   
 c. [cp That $[\omega:<\Pi, w_R>]$  [IP Max is $[\omega:<\Pi, w_R>]$  afraid of spiders]] $_i$ , Jack  
 believes $[\omega:w_b(j)]$   $t_i$

In (114b), *that* and the embedded Infl have their base-generated values, i.e. they have no value for  $\omega$ . No head-chain can be formed between the displaced CP and the verb *believe*, so its values cannot be copied onto the complementizer or Infl. Instead, the Complementizer Rule applies, specifying that as  $[\omega:<\Pi, w_R>]$ . A head-chain is formed between *that* and Infl, and Infl is also specified as  $[\omega:<\Pi, w_R>]$ . This means that the preposed CP is interpreted as an information unit, but it is not anchored to

Jack's belief-world. Instead, it is presupposed true. Now, the displaced information unit is coindexed with its trace, and will be interpreted as the direct object of believe, so the proposition *Jack believes that Max is afraid of spiders* will be added to the common ground and to the speaker's belief-set. This might be enough to establish *Max is afraid of spiders* as belonging to Jack's belief-set, perhaps by accommodation. But it does seem that (114) has a presuppositional sense that the corresponding non-displaced version does not. Now compare (115), where what is fronted is an IP.

- (115) a. \* Max is afraid of spiders, Jack believes.  
       b. [IP Max [ $\Gamma[\omega]$ ] is afraid of spiders]<sub>i</sub>, Jack believes[ $\omega:A, w_b(j)$ ]  $t_i$

In (115), no basic interpretation can be assigned to the fronted IP, because it does not bear  $\omega$ . It does not correspond to a basic type, so it cannot be coindexed with a trace. There is no default rule for non-root IP, and no head-chain can be formed. The sentence cannot be translated.

A *for* CP is slightly different, but the same principle holds. Infl needs a  $\omega$  feature specification; the  $\omega$  feature value provided by *for* does not identify the denotation of the IP as simply containing  $w_R$  but introduces a sense of irrealis (cf. Jespersen 1924); *for* might provide EXTENSIONAL anchoring, in the sense of Farkas 1992b, meaning that the IP is anchored not to a single possible world but to a set of alternative possible worlds. Certain heads can relativize the irrealis sense of *for*, for example *hate* and *like* seem to impose some requirement on the situation denoted by the infinitival IP that it be something that has been experienced, and such verbs as *manage* definitely anchor a proposition to  $w_R$ . Once again, all of these different anchorings can be seen as specifications for  $\omega$  features, which are provided either by *for* or by a governing verb, under chain-government.

Now we have an alternative to saying, as I did in §2, that a verb like *want* c-selects a non-finite CP; we could say instead that it supplies  $\omega$  feature specifications to its complement which are incompatible with tense, but which are compatible with a non-finite nexus, and are compatible with the complementizer *for*. These issues will be taken up again in Chapter 2; I will continue to refer to such relations as c-selection, though it can be seen that they are quite different from the original conception in Chomsky 1965 of strict subcategorization for syntactic categories.

### 3.5. Summary of §3

In many constructions, a feature specification on a given node is determined by some property of a neighboring node. For example, the

dative Case on the Icelandic DP in (116a) is determined by the preposition. Similarly, the participial form of the verb *leave* in (116b) is determined by the governing auxiliary. Or, as I discussed in §2, the finiteness of the CP complement to *believe* in (116c) is determined by that verb.

- (116) a. Hestarnir eru í túninu. (Ice)  
           *the.horses are in the.field.DAT*  
           'The horses are in the field'  
       b. Elvis is leaving the building.  
       c. John believes that pigs can fly.

None of these relations induce dependency; the dative noun phrase, the progressive participle, and the finite CP can all be displaced.

- (117) a. Túninu eru hestarnir í. (Ice)  
           *the.field.DAT are the.horses in'*  
           'The field, the horses are in'  
       b. Leaving the building is Elvis.  
       c. What John believes is that pigs can fly.

All of these relations can be analyzed as a form of feature-specification via head-chains, or they could be modelled by specifying feature values on a subcat list: the auxiliary *be* might c-select an ING complement, or it might be that a progressive participle has a certain feature, call it Aspect, which must be specified, and *be* has a value for that feature which can be copied onto the participle through chain-government. The important thing is that whatever relation this is, it is not disrupted by displacement, be it A-movement, A-bar movement, or some more indirect relation. The specifications provided for features by head-chains are assumed to be transmitted through A-chains and A-bar chains, or perhaps are satisfied at LF under reconstruction.

I have suggested that in some cases, the feature specifications determined by head-chains are crucial to the interpretation of an element. This corresponds in certain cases to their being non-basic types semantically, in set-theoretic notation: an object of type  $\langle e, e \rangle$  is not an entity but a function; if all variables are type  $e$ , then a variable can never be interpreted as corresponding to a function, and any incomplete constituents will have to remain in situ in order to be properly interpreted. This could be modelled as a constraint on reconstruction; I have cast it as a limitation on the inventory of variables, following the spirit of Chierchia 1985 and Chierchia & Turner 1988.

#### 4. Conclusion

To a certain extent, this chapter represents an attempt to build up a framework within which certain empirical problems, introduced in Chapters 2 and 3, can be resolved. As a result, the connections among some of the parts of this chapter may not be apparent to the reader at this point. This brief overview might help to pull some strands together.

In §1, I discussed previous work on predication. I adopted the position that every nexus, in Jespersen's sense, is built around a predicate of the sort proposed by Chierchia and Bowers. This predator has the effect of turning a property into a predicate. Infl, it was suggested, is one such predictor, but there is also a tenseless species of predictor, Pred, which heads the small clause.

The general program of stating constraints on syntactic representations in structural terms was adopted from GB. Certain issues regarding the Theta Criterion of GB were left unsettled, particularly the question of whether certain subjects (in Heycock's examples) get  $\theta$ -roles, and if so, from where. This matter will be dealt with in Chapter 2 below.

In §2, some specific constraints were explored, namely those having to do with the relation of a head to its complement. I argued that one such relation be identified with c-selection. I furthermore argued for a particular conception of head-chains, a mechanism for copying or sharing features across different parts of a syntactic tree, subject to strict structural constraints. I proposed that head-chains, under certain conditions, could supply a lower node with feature specifications, sometimes even when the lower node would not otherwise bear that particular feature (the Composition chain).

Finally, in §3, I developed the notion of dependency, in order to account for the failure of certain constituents to be displaceable. I pointed out that constituents which are not displaceable are also not licit as subjects. I argued that this was crucially tied in with limitations on the rules of semantic interpretation. A constituent which does not translate with a basic type cannot have a property predicated of it, and so cannot be a subject; in addition, it cannot be coindexed with a trace or dummy element, and so cannot be displaced. The theory of head-chain developed in §2 was employed to allow a proper translation of those elements in complement positions; only in complement position is the necessary configuration for head-chain formation (locality) available.

All of these proposals will be brought to bear on the data in Chapters 2 and 3.

# Propositions and States of Affairs\*

## 0. Introduction

In this chapter I show that various syntactic and semantic distinctions between two classes of verbs can be accounted for using the notions developed in Chapter 1. Specifically, I examine contrasts between EMOTIVE verbs (including desideratives like *want* and *wish* as well as factive-emotives such as *like*, *love*, *hate*, and *fear*) on the one hand and EPISTEMIC or proposition-oriented verbs (like *believe*, *consider*, *regard*, *prove*, and *demonstrate*) on the other, proposing that although both take nusal complements, the complement to a want-type verb is interpreted as a STATE OF AFFAIRS (in a sense to be defined), while the complement to a believe-type verb is interpreted as a PROPOSITION, which, following the discussion in Chapter 1, must ultimately be translated into an information unit. As shown in Chapter 1, the interpretation of an IP as an information unit requires the formation of a head-chain. The presence of such a head-chain in constructions with epistemic verbs is argued in this chapter to account for the differences between those constructions and constructions involving emotive verbs, which include no such head-chain.

Various syntactic and semantic distinctions between emotive and epistemic verbs have been discussed extensively. The account developed here introduces two things, apart from the specifics of the analysis. The first is more or less empirical: I demonstrate some distinctions between the two classes of verb which appear only at the small clause level; some of these distinctions have been noted previously, but others have been overlooked. Often, consider-type small clauses (i.e. small clause complements to consider-type verbs) have been taken as prototypical examples of small clauses; I show that in some important respects, want-type small clauses behave differently.

The other novel contribution here is more theoretical. I propose a basic distinction in the interpretation of the complements of the two types of verbs which, to my knowledge, has not hitherto been suggested, at least not plainly. The complement to *believe*, on this analysis, is interpreted as a proposition, which claim is fairly uncontroversial; but the complement to *want* has a different ontological status; it is interpreted as a state of affairs, by which I mean roughly what Vendler 1967 or Davidson 1967a, b mean by an EVENT, or what is meant in Situation

\* Some of the material in this chapter was presented at UCSC in November 1993 and the LSA meeting in Boston in January 1994. I thank my audiences there for useful discussion.

Semantics (e.g. Barwise & Perry 1983, Barwise 1989) by a SITUATION or SITUATION-TYPE.

I begin in §1 with a discussion of the basic data to be accounted for. In §2, I discuss the previous accounts which have directly influenced the current one, and in §3 I present the analysis. §4 is an application of the analysis to the data presented in §1, and §5 includes some further discussion of the distinction between states of affairs and propositions, which figures centrally in the analysis. I also show that the treatment presented for emotive and epistemic verbs also extends to perception verbs.

## 1. Data to be accounted for

The contrast between the sentential complements of verbs like *want* and those of verbs like *believe* has been the subject of much debate at least since Rosenbaum 1967, for whom they were distinguished as being obligatory versus optional undergoers of a 'pronoun replacement' transformation. The *want* class are often called emotive verbs (Kiparsky & Kiparsky 1970), or subject Equi verbs (Postal 1974) or subject control verbs (Chomsky & Lasnik 1977) (I am actually interested here in a subset of control verbs, those which allow an overt subject to be realized in the embedded clause; Postal's 1974 W-verbs). The *believe* class are sometimes called (subject to object) raising verbs (Kiparsky & Kiparsky 1970) or Exceptional Case Marking (ECM) verbs (Chomsky 1981). I follow Bresnan 1972 in using *want* and *believe* as emblematic of their respective classes. For extensive discussion, see Chomsky 1973, Postal 1974, Bresnan 1976, Postal 1977, Postal & Pullum 1988, and Pollard & Sag 1993. The main point of contention has been whether the DP plus infinitival VP following the verb is a constituent, as in Jespersen 1913, Chomsky 1973, and the bulk of work in GB since then, or not, as in Bresnan 1982, Gazdar et al. 1985, and most other non-GB work.<sup>1</sup> I will be following the former view. In the account to be developed, various contrasts between the two classes of verb follow from the fact that believe-type verbs take propositions as their complements, while want-type verbs take states of affairs.

<sup>1</sup> For Postal 1974, there is a constituent at D-structure which is separated at S-structure by a transformation; for Pollard & Sag 1993 the *want* class involves a nusal constituent complement but the *believe* class does not.

### 1.1. Infinitival complements

Some examples are shown in (1-2). It should be noted that in general, ECM verbs like those in (2) have what Bresnan calls "a bookish flavor".

#### (1) Want-type verbs

- a. Zhirinovsky wants the reformers to leave the parliament.
- b. We fear the rescue party to be lost in the mountains.
- c. They hate dogs to bark in the house.
- d. She likes her eggs to slide around on the plate.
- e. He loves us to turn the music up loud.
- f. We need this mess to be cleaned up by noon.

#### (2) Believe-type verbs

- a. The republics believe Zhirinovsky to threaten their independence.
- b. We find him to be unbearable.
- c. They proved the donkey to weigh less than was claimed.
- d. These doctors consider the patient to be capable of walking.
- e. John suspects the cook to smoke in the kitchen.
- f. Monarch butterflies perceive Santa Cruz to be a great place to spend the winter

Bresnan (1972, Chapter 3) listed the major syntactic differences between the two classes as follows: want-type verbs allow the complementizer *for*, allow subject-controlled Equi (PRO), disallow passive, and disallow reflexivization.<sup>2</sup> The believe-type verbs are the opposite: they never appear with *for*, they disallow Equi, they allow passive, and they allow reflexivization. A demonstration of each of these features is given in (3).<sup>3</sup>

<sup>2</sup> 'Reflexivization' was a transformation which replaced a pronoun with a reflexive pronoun in a particular context. The observation was that the subject of the complement of a want-type verb could not be a reflexive pronoun.

<sup>3</sup> Jespersen (1940:316) cites [i], from Dickens.

[i] He was wanted to bleed the prince

But this is not acceptable in present-day English, unless the infinitival is taken as purposive; cf. also the cases with small clauses in §2.2 below.

- (3) a. The cossacks {want/\*believe} very much for the commissar to dance.
- b. The commissar doesn't {want/\*believe} to dance.
- c. The commissar is {\*wanted/believed} to dance poorly.
- d. The cossacks {\*?want/believe} themselves to dance well.

These observations warrant some comments. First, many people are uncomfortable with *for* CP complements to at least some want-type verbs, but they improve when an adverb intervenes, as in (3a); the contrast is clear, as members of the *believe* class never appear with *for*. Second, the deviant status of reflexive subjects in want-type complements is not incontestable; I will take this up below (see also Bresnan 1972:180). The facts regarding PRO and passive are fairly clear, however, and the contrasts in each case are consistent. I will postpone discussion of Bresnan's analysis of these facts until §2, preferring to move on to some other contrasts between the two classes of verbs.

### 1.2. Small clause complements

When small clause complements are examined, some further differences emerge which distinguish emotive from propositional verbs. The *want* class behaves similarly with any nexal complement, whereas the *believe* class shows marked differences between infinitival and small clause complements. For this reason, it will be useful to introduce some additional terminological distinctions. I will use the terms '*believe* class' and '*believe*-type' to refer to those propositional or epistemic verbs which appear with infinitival complements, and I will refer to propositional or epistemic verbs which appear with small clause complements as the *consider* class, or *consider*-type, and will similarly refer to SCs which appear with *consider*-type verbs as *consider*-type SCs. In general, the *believe* class and the *consider* class are coextensive, and can be generally referred to as epistemic verbs, but there are a few verbs, such as *regard*, in the *consider* class which are not also in the *believe* class, and a few in the *believe* class which are not in the *consider* class, for example *believe*, for many people; I assume that this is a result of the vagaries of c-selection. The semantic interpretation of *consider* is exactly the same in relevant respects as that of *believe*, and any differences have to do (by hypothesis) with differences in c-selection. Since want-type verbs behave similarly whether they appear with infinitival or small clause complements, they can be referred to generally either as want-type verbs or as emotive verbs. Some examples are given in (4-5).

(4) **Want-type verbs**

- a. Zhirinovsky wants [reformers out of the parliament]
- b. We fear [the rescue party lost in the mountains]
- c. They hate [dogs in the house]
- d. She likes [her eggs over-easy]
- e. He loves [Metallica turned up loud]
- f. We need [this mess cleaned up by noon]

(5) **Consider-type verbs**

- a. The republics consider [Zhirinovsky a threat]
- b. We find [him unbearable]
- c. They proved [the allegations false]
- d. These doctors believe [the patient capable of walking]
- e. John thinks [it a great shame that you won't be coming]
- f. Monarch butterflies regard [Santa Cruz as a great place to spend the winter]

As noted in Chapter 1, it is crucial throughout what follows to avoid readings in which the main verb is taken as simple transitive, with a DP direct object, and the embedded predicate is taken to be a depictive adjunct. Such a reading for (4a), for example, would be, 'Zhirinovsky wants reformers on those occasions when they are out of the parliament.' Many of the claims I make below about want-type verbs may be quite false with respect to such constructions.

Pollard & Sag 1993 discuss these two classes at length. First, they note that the various contrasts between the *want* class and the *believe* class are repeated at the small clause level; for example, the DP following a consider-type verb may be promoted to subject position under passivization, while the DP following a want-type verb may not, as in (6).<sup>4</sup>

<sup>4</sup> Hornstein & Lightfoot 1987:31 suggest that passive is possible in these cases, offering [i].

- [i] a. Susan is wanted in New York.
- b. Susan is wanted as linebacker.

For me, the only way these examples can be considered grammatical is as passives of DP taking *want*, with *as linebacker* a depictive adjunct and *in New York* a depictive or locative (on this sort of reading, *Reformers are wanted out of the parliament* would also be acceptable). It should also be noted that Norwegian *ønske* 'wish' does allow passivization with small clauses, for example in [ii].

- [ii] a. Huset er ønsket revet.  
      *the.house is wished destroyed*

(continued next page)

- (6) a. Mary is considered [ \_ loyal to her friends]
- b. Santa Cruz is regarded [ \_ as a great place to spend the winter]
- c. \* That man is wanted [ \_ off my ship]
- d. \* Metallica is loved [ \_ turned up loud]

PRO is not possible, in general, in the subject position of a small clause complement to a want-type verb (or any other verb, apparently).<sup>5</sup>

- (7) a. \* My sister wants picked up at noon.
- b. \* The car needs washed.
- c. \* The cat likes in the sun.

Reflexives, on the other hand, are at least reasonably acceptable in small clause complements to want-type verbs.

- 
- b. ? Det ønskes et hus revet.  
*there is.wished a house destroyed*

Note that the example is constructed so as to make implausible a reading like those available in [i], i.e. the reading where the house is wanted, and in a destroyed state; and the corresponding English sentence is impossible. However, it seems that other emotive verbs in Norwegian resist this kind of construction, whereas passive *ønske* has become almost idiomatic in classified advertisements (*bil ønskes kjøpt* 'car is.wanted bought'), so I am inclined to treat *ønske* as the exception rather than the rule.

<sup>5</sup> Two notes are in order here. First, there is a significant minority dialect spoken (at least) in Pennsylvania for which (7a-b) are acceptable; Iveland 1993 suggests that the embedded predicate in such constructions must be an agent-oriented passive participle, though she notes that *want* also allows some prepositional phrases, giving the examples in [i].

- [i] a. The cat wanted in.
- b. % The hikers wanted over the mountain by sunset.
- c. % Felix wanted behind her in line for tickets

This brings us to the second point I wish to make, which is that [ia] is grammatical, if colloquial, for many speakers, and is not restricted to the dialect which allows (7a-b) and [i]. Hornstein & Lightfoot 1987:50 note of [ii] that it "somewhat idiomatic and non-productive".

- [ii] I want out of this room.

It seems that controlled small clauses in standard English are restricted to *want* plus *in* or *out*, but the dialectal facts noted above suggest that it must be possible in principle for a state of affairs small clause to be opaque to government, possibly by allowing a null complementizer there. The complementizer must be assumed to be able to restrict the category of the predicate in the appropriate way, since for example (7c) is ungrammatical for all speakers. If instead *want* were assumed to assign null Case in the sense of Chomsky & Lasnik 1991, there would be no account for the observed predicate restriction.

- (8) a. My sister wants herself arrested.  
 b. Don likes himself tan.  
 c. The cossacks hate themselves in red.

The examples in (7-8) seem at first to contradict a claim I made above, that want-type verbs behave similarly whether they take infinitival or small clause complements, since PRO is acceptable in infinitival complements to want-type verbs and reflexives are not, as noted above. I could in fact adopt two different terms for the different uses of emotive verbs, as I did for the epistemic verbs; however, it will turn out that the differences represented in (7-8) are in a sense more superficial than the differences which appear when epistemic verbs take different sorts of complements, and it will not be necessary to have two different terms for emotive verbs.

### 1.2.1. Constituency tests

One contrast that does not appear with IP complements has to do with the displacement of the SC. Stowell (1981, 1983) attributes the failure of some small clauses to pass constituency tests to Case theory (the subject of the displaced small clause is not in a Case-marked position).<sup>6</sup> However, Pollard & Sag (1993) show that want-type small clauses do pass constituency tests. Some examples are given in (9) ((9d) is Pollard & Sag's (30b) from their Chapter 3).

- (9) a. What I really want is [that man off my ship].  
 b. [Dogs in the house], they hate.  
 c. All we need now is [this mess cleaned up].  
 d. It was [Leslie in complete control of the situation] that we feared most.

Not all displacements of the SC complements to want-type predicates are equally good, but some, especially the pseudoclefts (as in (9a) and (9c)) are rather convincing. Compare attempted displacement of the complement to the consider-type verbs, as in (10) (cf. Raposo & Uriagereka 1993 for similar examples from Spanish involving perception verbs and consider-type verbs).

<sup>6</sup> This proposal would not be tenable in any case in the Minimalist framework. There, accusative Case is required only at LF in languages like English, and is licensed when a DP moves into SpecAgroP. Some form of reconstruction must undo A-bar movement in general in order to allow displaced accusative DPs; the subject of a reconstructed SC would be able to move at LF into SpecAgroP just as if it had not moved.

- (10) a. \* What I really consider is [Mary loyal to her friends]  
 b. \* [The allegations false], they proved  
 c. \* All we found was [our in-laws unbearable]  
 d. \* It was [Leslie in complete control of the situation] that we believed

All of the constituency tests fail all of the verbs of the *consider* class. In §3 below I will argue that SC complements to consider-type verbs are dependent in the sense introduced in Chapter 1, while SC complements to want-type verbs are not.

### 1.2.2. Quantifier scope

Another difference between want-type verbs and consider-type verbs at the small clause level involves quantifier scope. Williams 1983 points out that examples like (11a) have two readings, whereas examples like (11b) have only one (to keep the representations simple, I am ignoring the anchoring of the main and embedded propositions).

- (11) a. Someone seems to be angry at John.  
 i.  $\exists x: \text{person}'(x)$  [seem' [angry'(x,j)]]  
 ii. seem'[ $(\exists x: \text{person}'(x))$  [angry'(x,j)]]  
 b. Someone seems angry at John.  
 i.  $\exists x: \text{person}'(x)$  [seem' [angry'(x,j)]]

(11a) can mean either that there is a particular someone who is apparently angry at John (represented in (11ai)), or that it seems to be the case that someone is angry at John (but we don't necessarily know who)(represented in (11aii)). (11b) has only the former reading, the 'wide scope' reading. Williams points out that the same asymmetry holds in small clauses. In each of the pairs of examples in (12), the small clause has one less reading than the corresponding infinitive.

- (12) a. John believes someone to be angry at him.  
 b. John believes someone angry at him.  
 c. Mary proved two assumptions to be false.  
 d. Mary proved two assumptions false.

The examples in (13) show that want-type verbs contrast with consider-type verbs in this regard (this too was noted by Williams).

- (13) a. The boss wants someone to be arrested.  
 b. The boss wants someone arrested.  
 c. John needs two kinds of sugar to be in his coffee.  
 d. John needs two kinds of sugar in his coffee.

A quantified subject of a nexal complement to a want-type verb can scope under or over the want-type verb, regardless of whether the nexus is an infinitival or a small clause; thus each of the examples in (13) is ambiguous in the way that (12a) and (12c) are.

### 1.2.3. Null operator traces

Another set of data distinguishing the want-type SC from the consider-type SC involves tough-movement constructions and parasitic gap constructions, called NULL OPERATOR constructions in recent GB work. A contrast in this regard between infinitival and small clause complements to epistemic verbs is discussed in Berman 1973 (briefly) and Stowell 1991a (at length).

As noted in §1.1.4 in Chapter 1, Chomsky 1981 proposed that in tough-movement constructions, a null operator moves out of the position of the gap (indicated in (14) by "\_") into a higher specifier position ("Op"). Parasitic gap constructions as in (14b) are similarly analyzed.

- (14) a. John is difficult Op for anybody to please \_  
 b. Which candidate did you support without Op really liking \_?

The trace of a null operator can only occupy an object position, not a subject position, as indicated in (15) (cf. Berman 1973).

- (15) a. \* John is difficult Op for anybody to believe \_ to be intelligent  
 b. \* Which candidate did you support without Op really believing \_ to be admirable?

Interestingly, the subject of the consider-type SC patterns with objects for this effect (cf. Berman 1973:43 fn. 10, Stowell 1991a):

- (16) a. Who do you like without really considering admirable?  
 b. That's the kind of evidence you can use without proving irrefutable.  
 c. Mickey is easy to consider intelligent.  
 d. That kind of evidence will be difficult to show invalid.

The want-type class of small clause taking verbs contrasts with the consider-type class, in that the subject position of the nexal complement

to a want-type verb cannot host the trace of a null operator, whether the nexus is infinitival or a small clause. This fact is illustrated in (17).

- (17) a. \* Jeff is easy to want arrested  
 b. \* That kind of dog is difficult to like in the house  
 c. \* Who do you despise without really wanting arrested?  
 d. \* That's the kind of evidence you can use without fearing refutable.

The situation, then, with null operator traces is similar to the situation seen with quantifier scope: a contrast between a construction involving a believe-type verb (with an infinitival complement) and one involving a consider-type verb (with a small clause complement) is absent in the *want* class; in each case, the *want* class (with small clause or infinitival complement) patterns with the *believe* class (with infinitival complement), leaving the *consider* class as the odd man out. In §3 I will propose that this pattern is due to the obligatory formation of a head-chain between the head of the small clause complement to *consider* and the selecting verb.

### 1.3. Summary of contrasts

I summarize the different bits of data to be accounted for in the table in (18).

	<i>believe</i> + IP	<i>consider</i> + SC	<i>want</i> + IP	<i>want</i> + SC
for	no	no	yes	no
PRO	no	no	yes	no
reflexive	yes	yes	no	yes
passive	yes	yes	no	no
displacement	no	no	no	yes
narrow scope	yes	no	yes	yes
null operator	no	yes	no	no

In the next section I discuss some previous accounts for various parts of this pattern, and in §3 I present my own proposal.

## 2. Previous accounts

The contrast between want-type and believe-type verbs has been the subject of much debate. I make no attempt here to give a thorough summary of that debate; the interested reader should consult the references cited at the beginning of §1. Instead, I concentrate here on those few specific accounts which are most relevant to my own account, put forth in §3. I start with the GB account which developed from Bresnan 1972; that account is almost exclusively concerned with the differences between epistemic and emotive verbs with clausal complements, and has little to say about the differences among small clause complement constructions. I then move on to discuss the accounts of Stowell 1991a and Pollard & Sag 1993, which are concerned with pieces of the puzzle less central to the GB account. In each case I demonstrate weaknesses for the accounts, thereby indirectly motivating my own analysis in §3, which will be shown not to suffer from those particular weaknesses.

### 2.1. The GB account

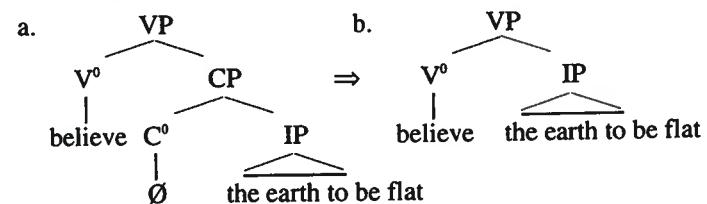
Bresnan 1972 proposed that the syntactic differences between the two classes of verbs stemmed from the fact that the semantics of the *want* class were consistent with the complementizer *for*, while the semantics of the *believe* class were not; the believe-type verbs subcategorized for a bare IP. Transformational rules of passive and reflexivization could not apply to a noun phrase following a complementizer, and complementizer deletion was crucially ordered after these transformations. The formulation of the Equi NP Deletion rule was also made sensitive to the presence of the complementizer.<sup>7</sup>

Later proposals developing this account in the GB framework (especially Chomsky 1981) have preserved the idea that the complementizer in the *want* class has the effect of protecting the embedded subject from influence from above. The believe-type verb, governing across the IP boundary, assigns Case to the embedded subject ('Exceptional Case-Marking'), prevents PRO from appearing there, and allows passive and reflexives. A rule deleting *for* when adjacent to V was postulated in order to allow examples like those in (1) without also allowing passive to affect the embedded subject.

<sup>7</sup> I am simplifying; Bresnan mapped out two accounts, one assuming the rule of Subject to Object Raising and one not.

In addition, a second, non-governing null complementizer was postulated in order to allow PRO. Another complication in this account is that it is assumed that IP cannot be selected, so believe-type verbs select CP, which undergoes an operation of 'S' deletion,' becoming IP.<sup>8</sup> Note that S'-deletion is crucially different from *for* deletion: S'-deletion eliminates a layer of structure, allowing SpecIP to be governed by V, while *for* deletion is more superficial, leaving an empty CP layer behind. S'-deletion is schematized in (19).

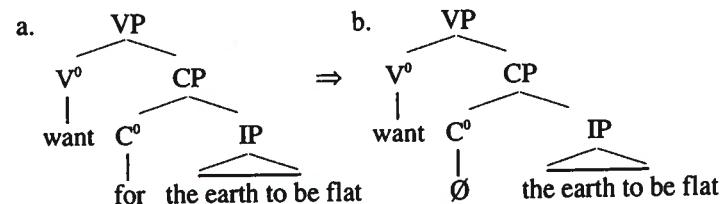
(19) S' deletion



In (19a), the CP complement to *believe* is headed by a null complementizer, which is always subsequently deleted. This complementizer apparently never appears except in ECM constructions prior to S-structure. In (19b), not only has the complementizer been deleted, but so has the CP layer (and the C, which I did not indicate in (19a)). This has the effect that the verb *believe* governs the subject of the embedded IP and can assign it Case.

*For* deletion is different. This operation is diagrammed in (20).

(20) *for* deletion



In (20a), the CP complement to *want* is headed by *for*. This is the same *for* that appears in various non-complement CPs, for example in *For Pippi to defeat the pirates would surprise Anniken* (cf. Chapter 1). Just in case that complementizer appears adjacent to the verb selecting it, *for*

<sup>8</sup> Pesetsky 1991, in a similar spirit, proposes that a null C<sup>0</sup> selected by *believe* undergoes head movement to adjoin to *believe*.

deletion may apply, and the complementizer is superficially deleted, as in (20b). This deletion, unlike S'-deletion, does not affect the structure of the CP; the CP layer is still there, and prevents *want* from governing the subject of the embedded IP. That subject receives Case not from *want* but from the null complementizer (alternatively, it receives inherent Case from *for* prior to *for* deletion). A nearly equivalent position sometimes assumed is that there is a null complementizer corresponding to *for*, which assigns Case and blocks government; (20a) and (20b) are then not derivationally related, but interpretationally equivalent.

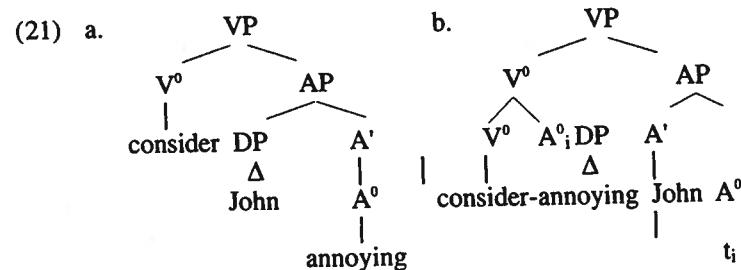
Left unaccounted for is the distribution of the different null complementizers. Why should it be that *for* appears with displaced or non-verb-adjacent infinitivals, but the null Case-assigning variant does not? Also, why is the other null complementizer, the one which does not govern and therefore allows PRO, not possible with believe-type verbs?

Another problem for the GB account is that it is not well equipped to deal with the differences that appear at the small clause level. This is because the crucial distinction between the *believe* construction and the *want* construction has to do with the nature of the complementizer, and it is generally assumed that small clauses have no complementizers at all. Take, for example, the case of PRO. PRO is supposed to be allowed with the infinitival following *want* because of the availability of a null non-governing complementizer that is compatible with *want* and with PRO. If small clauses never have complementizers, then small clause complements are correctly predicted never to have PRO subjects. But if it is the presence of a null complementizer that blocks passive constructions with *want*-type infinitivals, then why do small clause complements to *want* resist passivization? Another explanation is needed.

## 2.2. Stowell's small clause restructuring

Stowell 1991a develops an account that is consistent with the GB account and plugs some of the holes in it by giving a treatment for some of the small clause facts. Stowell concentrates on the *consider/believe* contrasts (i.e. the small clause/infinitival contrasts), ignoring the *want* class entirely. He notes the scopal facts of §1.2.2 (a quantified subject of a small clause complement to a consider-type verb cannot take narrow scope) and the null operator facts of §1.2.3 (the subject position of a small clause complement to a consider-type verb can host the trace of a null operator). Stowell proposes that these two facts result from a single phenomenon, which he calls small clause RESTRUCTURING, following in essence Rizzi 1978: the predicate of the small clause moves up to the higher verb to incorporate with it by head movement at LF. This has the result that the small clause subject position is θ-governed (governed by

its θ-assigner), which Stowell suggests is a condition on null operator traces. This is illustrated in (21).<sup>9</sup>



In (21b), the theta-assigner for *John, annoying*, has moved up to the V node, with the result that it properly governs *John* (given the minimal assumption that if the complex head X-Y properly governs Z, then its subconstituent Y also properly governs Z). *John* is then theta-governed, and the position it occupies can host the trace of a null operator in constructions like those in (101) above. To a certain extent, this restructuring can be seen as a latter-day version of Chomsky's (1955/1975) analysis of verbs like *consider* as complex transitive verbs consisting of a verb plus a predicate at some level of representation (cf. also Chomsky 1981:311 and Bach 1979). In that analysis, a transformation modelled on verb-particle shift inverted the DP direct object and the predicate. However, Chomsky also analyzed infinitival complements the same way (as well as the PP complement to verbs like *put*), and it is crucial for our present purposes that they be different. Still, the intuition that at some level, *consider-annoying* (and *throw-out*) are complex predicates is maintained.

Stowell also argues that restructuring accounts for the scopal contrasts noted in §1.2.2 above. Recall that Williams 1983 points out that examples like (22a) have two readings, whereas examples like (22b) have only one.

<sup>9</sup> Note that Rizzi 1986 explicitly argues against an incorporation analysis, on the grounds that it cannot account for some contrasts between these cases and the clause-reduction cases analyzed by Rizzi and others as involving incorporation. Instead, Rizzi proposes cosuperscripting, in the sense of Rouveret & Vergnaud 1980; this is similar to what I will propose below.

- (22) a. John believes someone to be angry at him.  
     i.  $\exists x: \text{person}'(x) [\text{believe}'(j, [\text{angry}'(x, j)])]$   
     ii.  $\text{believe}'(j, [\exists x: \text{person}'(x)] [\text{angry}'(x, j)])]$   
   b. John believes someone angry at him.  
     i.  $\exists x: \text{person}'(x) [\text{believe}'(j, [\text{angry}'(x, j)])]$

(22a) can mean that there is a particular someone who John believes to be angry at him (represented in (22ai); I have used *angry'(x,j)* to suggest the reading where the someone is angry at John, but of course *angry'(x,y)* could be used instead). (22a) can also mean that John believes that someone is angry at him (but he doesn't necessarily know who)(represented in (22aii)). (22b) has only the former reading, the 'wide scope' reading. The generalization is that the small clause has one less reading than the corresponding infinitive.

The observed pattern can be interpreted to mean that the small clause does not act as a domain for quantifier scope; assuming a system of quantifier raising (QR) along the lines of May 1977 or May 1985, we can assume that QR may adjoin to IP but not to SC; this gives the representations in (23).

- (23) a. i. [IP<sub>i</sub>someone; [IP<sub>j</sub>John believes [IP<sub>k</sub>t<sub>i</sub> to be angry at him]]]  
      ii. [IP<sub>j</sub>John believes [IP<sub>i</sub>someone; [IP<sub>k</sub>t<sub>i</sub> to be angry at him]]]  
   b. i. [IP<sub>i</sub>someone; [IP<sub>j</sub>John believes [SC t<sub>i</sub> angry at him]]]  
      ii. \* [IP<sub>j</sub>John believes [SC someone; [SC t<sub>i</sub> angry at him]]]

The two readings for (22a) are represented in (23a); (23bi) represents the one reading of (22b), and (23bii) represents the impossible narrow scope reading for (22b), where the quantifier has adjoined to SC. However, this amounts not to an explanation of the facts but merely a description.<sup>10</sup>

Stowell proposes something he calls the Predicate Scope Principle, which requires a quantifier to take scope over the entire chain containing the head of a predicate. His principle is stated in (24)

<sup>10</sup> May (1985:62) notes that some people get only wide-scope readings here even with infinitival complements, and suggests that this can be taken to support the S'-deletion analysis of subject-to-object raising (Chomsky 1981); he suggests that since S is not (on that analysis) a maximal projection, a quantifier adjoined to it would be taken to scope over the main verb. Here, SC is assumed to be a maximal projection (as is S), and there is no S'-deletion. Furthermore, even if the account could be updated in some way it would not offer an account of the contrast between SCs and infinitival clauses, for those speakers who get one.

- (24) Predicate Scope Principle (Stowell 1991a:202)  
   a. A quantifier phrase QP must take scope over a predicate P  
   b. For any predicate head P appearing in a chain of head positions (P, t<sub>i</sub>, ..., t<sub>n</sub>), QP takes scope over P if and only if QP c-commands P

Given this principle, the SC whose head has moved out of it will not qualify as a predicate for purposes of determining scopal domains. This gives the representations in (25) for the possible and impossible readings of (b).

- (25) i. [IP<sub>i</sub>someone; [IP<sub>j</sub>John believes-angry<sub>j</sub> [SC t<sub>i</sub> t<sub>j</sub> at him]]]  
      ii. \* [IP<sub>j</sub>John believes-angry<sub>j</sub> [SC someone; [SC t<sub>i</sub> t<sub>j</sub> at him]]]

Stowell suggests that restructuring is motivated by a general ban on small clauses as arguments. The idea is that small clauses are unsuitable arguments, but after restructuring, there are no longer small clauses in argument positions. However, this cannot be correct for a number of reasons. First, we have already seen (in Chapter 1, §1.1.2 and §3) that small clauses are licit as subjects; subject small clauses could not restructure as their predicates are not in a position appropriate for head-movement. Furthermore, even with respect to the phenomena that Stowell discusses, there are counterexamples. In constructions with want-type verbs, QR can adjoin to SC, as the examples in (26) show.

- (26) a. The boss wants someone to be arrested.  
   b. The boss wants someone arrested.  
   c. John needs two kinds of sugar to be in his coffee.  
   d. John needs two kinds of sugar in his coffee.

Each of the examples in (26) has two readings. This is quite general for want-type SCs; they have the same two readings that the corresponding infinitivals have. Williams 1983 notes this for the verb *want*, but suggests that it is due to the fact that *want* takes an intensional direct object (a narrow-scope direct object, in his terms). Certainly it is true that a sentence like (27a) (from Williams) has two readings. But note that (27b) does not.

- (27) a. I want a unicorn.  
   b. I like a unicorn.

*Like* and *fear* do not in general introduce intensional readings; but the scopal ambiguities noted above for *want* and *need* apply to *like* and *fear*

as well, as can be seen by the fact that the examples in (28) have two readings each (just as do the corresponding infinitival structures).

- (28) a. John likes a unicorn by his side.  
 b. We fear two people missing.

Thus it appears that QR may attach to SC, just not consider-type SC. Still, restructuring can be seen to be responsible for the difference, but Stowell's claim that all small clauses undergo restructuring must be revised. Instead, we could say that only consider-type SCs undergo restructuring. We would then have to come up with another explanation for why restructuring occurs in the first place. However, there are some other problems for the restructuring proposal.

Like the abstract head movement proposals discussed in Chapter 1, the restructuring account seems to be incompatible with certain coordinate structures. Recall that abstract head movement would result in ATB violations when the landing site is the target for two different heads, as in (29).

- (29) a. Josephine considers Mary lucky and Fred unfortunate.  
 b. Josephine considers Mary a fool and Fred just as silly.

In (29a), two different adjectives vie for the same head position, assuming restructuring. In (29b), a noun and an adjective must both adjoin to *consider*. In §2.3, I show some additional problems, where a small clause is coordinated with a clause. For Stowell, clauses do not undergo restructuring at all, so it seems that such structures would result in CSC violations at LF.

I will propose an alternative to restructuring in §3 below, but I will attempt to preserve the insight behind it, which I see to be the following: the result of restructuring is that the subject of the consider-type small clause becomes more like a direct object in some sense. This is the same intuition that lies under the debate about raising verbs; the subject of a proposition-denoting nexus behaves "more like a direct object" than the subject of a state of affairs-denoting nexus.

### 2.3. Object raising

In some works, such as Postal 1974, the noun phrase following a verb like *consider* or *believe* is its direct object at S-structure, having moved from a deep embedded subject position. In other works, such as Bresnan 1982 and Williams 1983, the postverbal noun phrase is a direct object at all syntactic levels; the predicational relation between that noun phrase and the XP to its right does not imply constituency.

Pollard & Sag 1993 allow for both possibilities, not in the course of a derivation, as in Postal 1974, but for the two different classes of verbs with nexal complements. They propose that the various differences between the two classes of verb stem from the fact that although emotive verbs take a single nexal complement, epistemic verbs take two complements, a direct object noun phrase and a predicate. A certain intuition is shared with the GB account: in the GB account, various facts traditionally associated with 'direct objects' are subsumed under government relations, including Case assignment, the possibility of A-movement under passive, the possibility of reflexive binding, and so on. In HPSG as outlined in Pollard & Sag 1993, those same facts have to do with being the first (least oblique) complement on the SUBCAT[egorization] list (or COMP[lement]S list, in their chapter 9). In the GB account, the subject of the nexal complement to *want* is not governed by *want*, and therefore does not behave like a direct object, but the subject to the nexal complement of *believe* or *consider* is governed by the higher verb, and does show direct object properties. In the HPSG account, the noun phrase immediately following *want* is not its complement, and is not on its SUBCAT list, but the noun phrase following *believe* or *consider* is. As Pollard & Sag note, their proposal is inconsistent with Chomsky's Projection Principle; they suggest that the Projection Principle must be abandoned or revised.

An advantage to Pollard & Sag's account over the GB account is that, since it does not rely on the complementizer to distinguish the two constructions, it treats infinitival and small clause constructions alike. This is a positive result since they pattern identically in most cases, as noted in §1.1-1.2. However, this advantage is not without its drawbacks, as Pollard & Sag's account does not have a ready explanation for those cases in which infinitival and small clause complements are different, as discussed in §1.2-1.3. For example, take the null operator constructions. Recall that the argument position immediately following *consider* (with a small clause complement) could host the trace of a null operator (*John is tough to consider intelligent*), while the argument position immediately following *believe* (or *consider*, with an infinitival complement) could not (\**John is tough to believe to be intelligent*). For Pollard & Sag, both cases involve a direct object position; the only difference is in the second complement of the verb *believe* or *consider*. There is no obvious reason for the contrast.

Another problem for Pollard & Sag's account is that there are various reasons to believe that the nexal complements to *believe* and *consider* are single constituents, as discussed in Chapter 1, §1. For example, Chomsky's 1981 Projection Principle is commonly interpreted

to require that levels of linguistic structure are isomorphic with respect to argument structure; thus, if a verb like *believe* is logically dyadic, representing a relation between individuals and propositions, then it is dyadic at DS, SS, and LF. A critique of this position is presented in Postal & Pullum 1988, and I will not attempt to counter it here. Instead, I will provide one new argument for the small clause status of the DP XP sequence.

A piece of evidence for the constituent status of the DP XP sequence following *consider* is that it alternates with infinitival clauses, as noted above: almost every verb that takes an DP XP sequence (a small clause, on the analysis adopted here) also takes an infinitival IP complement. The small clause may even be coordinated with an infinitival clause, as in (30) (see Gazdar et alia 1985:174 ff. for a theory of coordination of non-identical categories).<sup>11,12</sup>

- (30) a. I consider [Mary qualified] but [John to be more likely to get the position]
- b. I don't consider [Mary qualified] or [John to be likely to get the position]
- c. They proved [the allegations false] and [the evidence to have been fabricated]
- d. They proved [the allegations to be false] and [the evidence fabricated]

<sup>11</sup> The GPSG theory of coordination of unlikes is specifically designed to allow for the coordination of predicates, as in Gazdar et alia's example *Her father was well known to the police and a devout catholic*. However, it is clear that coordination of unlikes must also be possible in complement position; for example, in [i] (pointed out to me by Jim McCloskey) and [ii], a concealed question NP is coordinated with an interrogative CP.

- [i] We can work out [the volume of liquid in the bowl] and [how long it will take to evaporate]
- [ii] She wouldn't tell me [the price of the tickets] or even [what time the show started]

<sup>12</sup> Jespersen 1924:123 noted such SC-IP coordinations, giving the example in [i].  
 [i] He felt [himself dishonored] and [his son to be an evil in the tribe].  
 He also noted cases where an adjectival predicate is coordinated with a bare VP, as in [ii].

- [ii] a. ...made most people [fond of her] and [pity her]
- b. ...made me [proud] and [try to draw as well as I could]

While I find [i] (and the examples in (30)) perfectly acceptable, the examples in [ii] sound slightly marked. I have no explanation.

Of course, for Pollard & Sag these are not infinitival IPs but DP XP sequences, where XP is an infinitival VP (with the 'marker' *to*). It is not clear how their analysis would treat the structures in (30); presumably as some form of gapping or other non-constituent coordination, coupled with the theory of coordination of unlike categories. Example (30d) is especially amenable to a gapping analysis, but the others are not, as they would have to involve leftward gapping, which is supposed to be impossible in VO languages (Ross 1970). A more serious problem for Pollard & Sag's proposal would be coordination of a finite CP with (what is on the analysis adopted here) a small clause or an infinitival IP; such structures are not commonly encountered, but I think they are possible. Some examples are given in (31).

- (31) a. ? They proved [the allegations to be false] and [that the evidence was fabricated]
- b. ? I believe [Mary to be qualified] but [that John will get the job]
- c. ? I really didn't find [him to be unbearable] or even [that he had any irritating habits]
- d. ? The police showed not only [a wheel to be missing] but also [that the car had been sabotaged]

These examples are admittedly marked, but I believe that this stems from a mismatch in the temporal specification of the two complements. In the account to be developed below, it will be seen that small clauses denoting propositions are dependent on the higher clause in a more intimate way, and I think this accounts for the reduced acceptability of the examples in (32).

- (32) a.?? They proved [the allegations false] and [that the evidence was fabricated]
- b.?? I believe [Mary qualified] but [that John will get the job]
- c.?? I really didn't find [him unbearable] or even [that he had any irritating habits]
- d.?? The police showed not only [a wheel missing] but also [that the car had been sabotaged]

Notice that similar coordinations with complements of want-type verbs are much worse, and yet there the constituency of the DP XP sequence is not at issue.(33) a.\*? I fear [the rescue party (to be) lost] and [that we'll be stuck here forever]

- b.\*? They hate [dogs (to be) in the house] and [that everyone expects them to like it]
- c.\*? She really doesn't like [you (to be) on the sofa] or [that you eat her snacks]
- d.\*? He loves [the house (to be) clean] and [that everyone complements him on it]

The badness of the examples in (33) stems from a mismatch between the two types of complement; the non-finite complement is necessarily interpreted as a state of affairs, while the finite CP is a proposition. The two are insufficiently similar for licit coordination. To the extent that they are acceptable, they must be read as involving a forced interpretation (by hearer accommodation) either of the finite CP as a state of affairs or of the non-finite nexus as a proposition. Better are examples where an SC or infinitival clause is coordinated with an DP of the appropriate semantic type (I return to this matter in §3 below).<sup>13</sup>

- (34) a. ? They hate [parties] and [(for) dogs (to be) in the house].  
 b. ? She really doesn't like [your loud music] or [(for) your feet (to be) on the sofa].  
 c. ? He loves [order] and [(for) the (to be) house clean].  
 d. ? The governor wants [three-time felons (to be) denied parole] and [a one-thousand percent handgun ammunition tax].

If the examples in (31) really involved a non-constituent DP XP sequence coordinated with a CP, we would expect them to be far worse than the examples in (34), on a par with the examples in (35).

- (35) a. \* She proved [her point] [easily] and [that she shouldn't be taken lightly]  
 b. \* I believe [Mary's stories] [whenever she is earnest] but [that John is a liar]  
 c. \* I really didn't find [my keys] [in the snow] or [that you had shoveled the walk adequately]  
 d. \* The police showed not only [some convincing slides] [to the jury] but also [that the car had been sabotaged]

<sup>13</sup> The following examples are attested ([ia] is from a newspaper ad and is probably intended humorously; [ib] is a direct quote cited in a newspaper interview, pointed out to me by Jim McCloskey).

[i] a. I wish for everyone to get along... and my own phone.                    b.  
 I want a big raise and for my company to go public.

The coordinate structures shown in (30-31) above, in which a small clause is coordinated with an infinitival or finite clause, are serious problems not only for Pollard & Sag's analysis, but also for Stowell's. For Stowell, the head of the small clause should combine with V at LF, and the head of the clause should not; but this would result in a CSC violation.

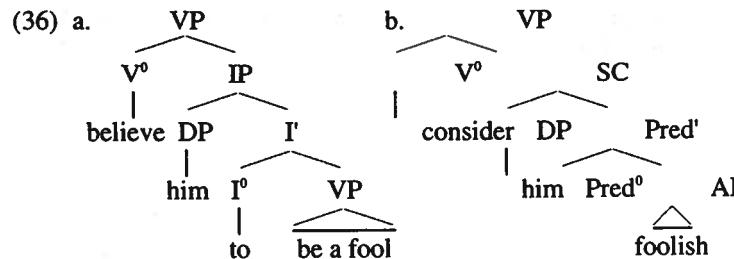
In the next section I detail my own proposal.

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### 3. The analysis

In this section I develop my own analysis of the complements to epistemic and emotive verbs, building on the proposals in Chapter 1. The basic idea is that although the two types of verb take nexal complements, those nexal complements get different interpretations. The complement to *want* is interpreted as a state of affairs (to be defined below), while the complements to *believe* and *consider* are interpreted as propositions. A non-finite nexus cannot be interpreted in isolation as a proposition. In order to receive a propositional interpretation, a non-finite nexus must get certain features from some higher head, via a head-chain. Most of the differences among the various constructions ultimately reduce to differences among the head-chains required for interpretation.

Some structures are shown in (36).



There is no S'-deletion; the IP in (36a) is the base-generated complement of *believe*. Recall from Chapter 1 that IPs are always dependent on a higher node for anchoring: although IP translates compositionally as a formula, this is not a sort of entity. An epistemic verb is a relation between entities, specifically individuals and information units, so in order to interpret a construction in which an epistemic verb appears with an IP complement, some rules of translation have to be applied to construct an information unit from the formula. In Chapter 1, I proposed that Infl bears a modal anchoring feature,  $\omega$ . I then proposed the rule of translation in (37) ((107) from Chapter 1, §3).

(37) If an IP P has intension  $\phi$  and a  $\omega$  value consisting of pairs of the form  $\langle \alpha, \beta \rangle$ , then P corresponds to an information unit of the form  $\alpha(\beta, \phi)$  (for each  $\alpha$  and  $\beta$  in the value of  $\omega$ ).

I also proposed that Infl was base-generated without a specification for  $\omega$ , making it impossible to apply rule (37) to a base-generated IP. In the course of the derivation, the  $\omega$  feature must be specified, possibly via the Root Rule in (38) ((108) from Chapter 1).

### (38) Root Rule:

If P is a root indicative declarative sentence uttered by x, and the context set at the time of utterance is  $w_R$ , then specify the  $\omega$  value of P as  $\langle \langle A, w_R \rangle, \langle A, w_b(x) \rangle \rangle$ .

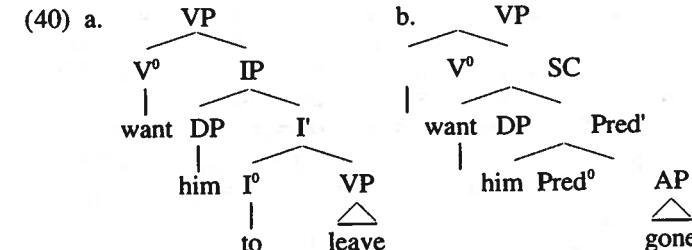
The other option is to specify the  $\omega$  features on Infl via a head-chain (as defined in Chapter 1, §2) which allows the copying of feature-specifications from a higher verb or complementizer. Epistemic verbs are assumed to bear lexically determined specifications for  $\omega$ . The complementizer *that* can receive a value from a higher verb, via a head-chain, and is otherwise subject to the default rule in (39) ((109) from Chapter 1).

### (39) Complementizer rule:

*that* has  $\omega$  value  $\langle \Pi, w_R \rangle$ .

Assuming that non-finite Infl and Pred also have a  $\omega$  feature, and that the translation of PredP is subject to rule (37), then certain predictions are already made about the structures in (36). According to the notion of dependency developed in Chapter 1, §2, the infinitival IP and the PredP in (36) will be dependent, meaning that they cannot be displaced. This was observed to be the case for small clauses in §1.2.1 above (cf. Stowell 1983), and of course it is also true of infinitival IPs; I will return to this in §4.4 below.

Some structures with emotive verbs are given in (40).

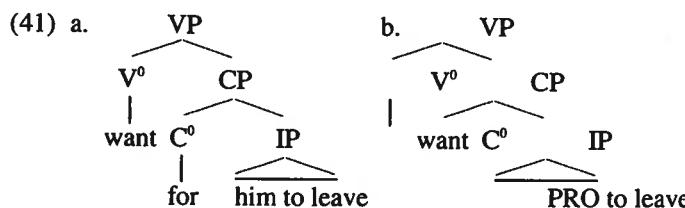


In (40a), the complement to *want* is an IP. As above, the IP can be translated as a formula, but not as an entity. *Want*, unlike *believe*, is not a relation between individuals and information units; but like *believe*, it is a relation between individuals and a kind of entity, namely a state of affairs. Just as was the case with *believe*, the IP complement to *want* cannot receive the right interpretation without a certain feature specification, one which is only available via a head-chain. Just as with *believe*, the infinitival IP complement to *want* is dependent in the sense

that it cannot be displaced (*\*What I want is him to leave*). On the other hand, we saw in §1.2.1 that the small clause complement to a want-type verb is not dependent (*What I want is him gone*). This means that the PredP in (40b) can be translated as a state of affairs, without the formation of any head-chain. I will argue here that there is a particular feature, crucial to the semantic representation of a state of affairs, for which Pred is specified but Infl is not.

If there is a licit interpretation for the SC in (40b), then why can't the SC in (36b) also receive this interpretation, making it independent? To answer this question, I invoke the notions of c-selection and s-selection discussed in Chapter 1, §2. Epistemic verbs either c-select or s-select propositions or information units; the object of belief, for example, is something which can be believed, or thought true. A state of affairs is simply the wrong kind of object. It makes not sense to say of a state of affairs that it is true or false, and it cannot be believed. On the other hand, one can hold positive or negative emotional attitudes to states of affairs, and this makes them happy candidates for complements to emotive verbs.

There is one more option in the case of want-type verbs: they may take a CP complement, as in (41).



Here, the fact that the CPs can be displaced (cf. Chapter 1, §3) indicates that they are independent. No head-chains are formed between the complement CP and the higher structure as the CPs in (41) are interpretationally complete. An immediately obvious possibility is that there is a Complementizer rule for *for*, and perhaps another one for the null complementizer in (41b), based on the Complementizer rule for *that* in (39) above, specifying a default value for the  $\omega$  feature on the complementizer. This would supply the anchoring information necessary to interpret the embedded IPs in (41) as information units. However, I believe that the appropriate interpretation for the CPs in (41) is as states of affairs, and that the value for *for* is not a  $\omega$  value but something else.

In the following subsections I discuss the formal properties of propositions (and information units) and states of affairs. In §4 I apply the analysis to the body of data examined in §1.

### 3.1. States of affairs and propositions

The need for a basic ontological distinction between events and propositions has been noted many times, for example in Vendler 1967, Lyons 1977, Davidson 1980a, or Barwise 1989, Chapters 4 and 10. In addition to events, I want to include non-dynamic situations in this discussion, and have adopted the term STATE OF AFFAIRS for this purpose (cf. also Bach's 1986 EVENTUALITIES).

Consider some of the salient differences between states of affairs and propositions. A proposition is true or false, something which cannot be said of states of affairs. Certainly a particular state of affairs may hold or not hold of a given model; but a proposition is an assertion or denial about something, either about an individual in the model or about the model itself. Thus a proposition must be anchored to a world, in the sense discussed in Chapter 1, §3. A state of affairs in which someone is asleep is not identical to the proposition, 'Someone is asleep.' That proposition must be evaluated in terms of its truth relative to the place and time of utterance and the background assumptions of the speaker and hearer regarding the relevant domain of discourse, the definition of sleeping, and so on. Without such an evaluation, it is not a proposition.<sup>14</sup> Thus, as I noted in the beginning of this chapter, propositions are the sorts of things that can be believed, denied, claimed, doubted, pretended, and so on. States of affairs can be liked, disliked, desired, perceived, or even imagined, but they cannot be believed or denied.

Of course, we could model the objects of epistemic and emotive verbs as intensions of formulas, and allow anchoring rules to differentiate the two (as in Farkas 1992b). For example, we could say that each individual has a number of desire-worlds, and that the intensional translation of the object of *want* is added to the want-set, following the discussion of belief contexts in Chapter 1. But notice that the model of desire (and other emotions) will then be more complicated, in a sense, than the model of belief (or of dreaming, or of saying); in the case of belief, we could assume that an individual's beliefs were consistent, at least in the general case; it is usually possible to make valid inferences about an individual's beliefs. The case of dreaming is perhaps less clear, but it does seem that certain inferences can be made (if you dreamt that

<sup>14</sup> A proposition with an anchor and a mode of anchoring was modelled in Chapter 1 as an information unit, and it might be more precise to speak of the contrasts between information units and states of affairs, but I will use the more familiar and less cumbersome term proposition when no confusion could arise.

you were a horse, and that all horses could fly, then in that dream it must have been the case that you could fly).

Emotive relations, on the other hand, are quite different. It is quite possible to have contradictory emotions (cf. McCawley 1977). The same individual can like and dislike the same thing. I can want to be a horse, and want all horses to fly, but not want to be a flying horse. I can even want the doctor to examine me without wanting to be examined. This is expected if emotive verbs are not taken to model a desire-world or a like-world, but simply indicate emotive attitudes toward a set of things (in the most general sense; entities), with no way of making inferences across the set.<sup>15</sup>

Another possibility is to develop a semantics in which propositions and states of affairs are both treated extensionally (à la Barwise & Perry 1983). However, this makes it very difficult to account for modality in belief-contexts (compare *John considers Mary (to be) possibly qualified* with *John wants Mary (\*possibly) arrested* and *John likes his eggs (\*possibly) scrambled*). I conclude that beliefs are best modelled as propositions (recall that  $w_1$  in Chapter 1, §3 was a proposition, the non-empty intersection of all the propositions in a belief-set), while desires are best modelled as a collection of objects, not systematically related to each other (except perhaps in terms of relative intensity of desire). States of affairs are one of the sorts of objects that can be desired (or liked or hated, etc.). In the next subsection I adopt a formal model for representing states of affairs.

### 3.1.1. The Situation Semantics SoA

A formal model for a state of affairs is proposed in Barwise & Perry 1983. For them, a SITUATION-TYPE is a set of pairs, each of which consists of a polarity (0 or 1) and a CONSTITUENT SEQUENCE; roughly, a constituent sequence is a predicate and a list of arguments for that predicate. A STATE OF AFFAIRS (or SoA) is a pair consisting of a spatiotemporal location (represented using the variable  $l$ ) and a situation-type. A crucial point is that a state of affairs can be a partial situation, where some part of the state of affairs is unspecified (or ‘parameterized,’ hence the term PARAMETERIZED STATE OF AFFAIRS in recent work in situation theory). Some very simple examples are given in (42) to illustrate.

<sup>15</sup> This is a bit too strong. It seems that certain inferences can be made about emotional attitudes; for example, if you like X more than Y and Y more than Z, then it seems reasonable for me to infer that you like X more than Z (cf. Lepore 1986).

- (42) a.  $\langle l_1, \{<1, \text{sleep}'(j)\}\rangle$
- b.  $\langle l_1, \{<0, \text{sleep}'(j)\}\rangle$
- c.  $\langle l_1, \{<1, \text{sleep}'(x)\}\rangle$
- d.  $\langle l, \{<1, \text{sleep}'(j)\}\rangle$

(42a) is a situation, or state of affairs, in which John is sleeping at some spatiotemporal location  $l_1$ . (42b) is a situation occupying the same spatiotemporal location (i.e. occupying exactly the same space and the same time span; this spatiotemporal location has the designation “ $l_1$ ” in the model we are imagining for the moment). (42c) contains a variable,  $x$ , which ranges over individuals. Thus (42c) represents a state of affairs characterized by some individual sleeping at  $l_1$ .<sup>16</sup> Finally, (42d) contains an unindexed instantiation of  $l$ , which by convention is a spatiotemporal variable. Thus (42d) represents a state of affairs characterized by John sleeping at some time in some place. Since  $l$  is unindexed, this can be considered a situation-type, i.e. a type of situation. This is the most important sort of state of affairs for the present purposes.

A single state of affairs may be more complex, and it may involve more than one variable. The examples in (43) are states of affairs.

- (43) a.  $\langle l, \{<1, \text{sleep}'(x)\}, \{<1, \text{drool}'(x)\}\rangle$
- b.  $\langle l, \{<1, \text{chase}'(f, d)\}, \{<0, \text{bark}'(f)\}, \{<0, \text{sleep}'(j)\}\rangle$

(43a) is a state of affairs in which someone is sleeping and drooling at some time in some place; (43b) is a state of affairs in which Felix ( $f$ ) is chasing Fido ( $d$ ), Felix is not barking, and John is not sleeping, once again at some time in some place. I will not go into more detail regarding the structure of eventualities. The important points here are that every SoA has associated with it some spatiotemporal location  $l$ . If that location is not specified, as in (43), then the state of affairs is an abstract entity, not located in the world, but it still has an  $l$ ; in (43a), for example, the sleeping and the drooling are crucially simultaneous; what holds of (43a) does not necessarily hold of those SoAs in which someone is drooling and asleep at different times.

There is an obvious similarity between the Situation Semantics spatiotemporal location and Davidson's 1967a EVENT ARGUMENT. Davidson suggests that non-stative predicates introduce an event argument in their argument structure, and that various adverbial modifiers used in a clause are predicated of this argument. A similar effect can be

<sup>16</sup> (42c) could be expressed without unbound variables, by using an existential quantifier, for example  $\langle l_1, \{[\exists x: \text{person}'(x)] [\text{sleep}'(x)]\}\rangle$  (ignoring the polarity, which can be assumed to be 1 if a negation operator is used in cases of negative polarity).

had by allowing adverbial modifiers to take  $l$  as their argument in representations like those in (43) (cf. Gawron 1986a, b for a move in this direction); the net result is that the spatiotemporal location of an event is identified with the event itself; if *at midnight* is a one-place predicate over spatiotemporal locations, then *Jones buttered the toast at midnight* means that the spatiotemporal location in which Jones buttered the toast has the property of being at midnight (cf. Davidson 1969 for some relevant discussion). However, at least some adverbial modifiers cannot be analyzed in this way, as a single event may, for example, be both intentional and unintentional, when viewed from different perspectives. I will return to this issue in §4.1.2 below. First, I will move on to some issues more directly relevant to the identification of  $l$ .

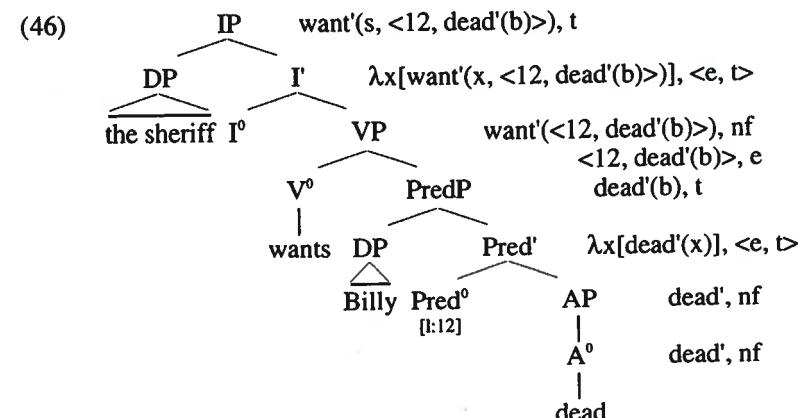
### 3.1.2. Translating the SC complement of *want* as a SoA

Based on the observation that the small clause complement to a want-type verb is independent, and operating under the intuition that that small clause denotes a state of affairs, we can develop a first approximation of a formal representation for states of affairs as follows. A nexal structure (an IP or PredP) provides the kind of information we need for Barwise & Perry's 'constituent sequence,' in the form of a formula. Taking the spatiotemporal location parameter to be a feature  $l$  with values ranging over actual spatiotemporal locations (which can simply be represented as integers, for present purposes), we can postulate the translation rule in (44).

- (44) If  $S$  translates as  $\sigma$ , type  $t$ , and  $S$  bears a  $l$  value  $\alpha$ , then  $S$  corresponds to a state of affairs of the form  $\langle\alpha, \sigma\rangle$ , type  $e$ .

In the representation of states of affairs as pairs of locations and formulas, the Situation Semantics indication of polarity is lost; I will assume that formulas have positive polarity unless otherwise indicated. Now we make one additional assumption, namely that Pred bears the  $l$  feature and has a value specified for it. This means that a PredP will in general be able to receive a licit translation as a state of affairs, following rule (44). For example, the sentence in (45) can be translated as in (46), arbitrarily using '12' as the value for  $l$ .

- (45) The sheriff wants Billy dead.



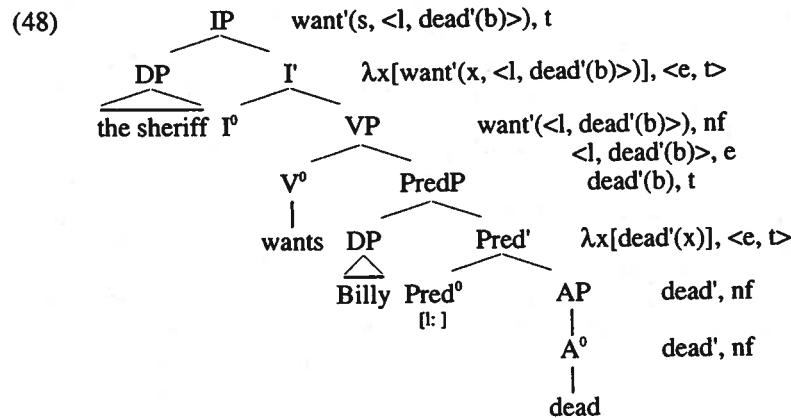
Here the PredP translates uncontroversially as a formula, then the rule in (44) applies, and the state of affairs translation is arrived at. This is taken as an argument by *want*. The root IP would be translated into an information unit, as seen in Chapter 1, §3. We can capture the dependency of an infinitival IP complement to *want* by saying that it is not specified for  $l$ , just as we explained the dependency of a proposition-denoting IP by saying that it was not specified for  $\omega$ . Whether this is a justifiable move depends on what exactly  $l$  represents.

However, there is a problem with the translation in (46). It seems to mean that the sheriff is in a want relation with a particular situation, namely the situation in which Billy is dead at spatiotemporal location 12. This is not actually what (45) means. What (45) means is that the sheriff is in a want relation with a situation-type, the type of situation characterized by Billy being dead. This is exactly what the unindexed variable  $l$  was said to accomplish in the states of affairs in (42d) and (43) above. Now, using  $l$  as a feature, we want the PredP in (46) to bear no value for  $l$ , or perhaps to have some dummy value acquired by default. To this end, Rule (44) above is restated with a minor adjustment in (47) below.

- (47) If  $S$  translates as  $\sigma$ , type  $t$ , and  $S$  bears a  $l$  feature specification  $\alpha$ , then  $S$  corresponds to a state of affairs of the form  $\langle\alpha, \sigma\rangle$ , type  $e$ .

Here we let 'feature specification' include an unspecified feature  $l$  (an equivalent effect could be had by postulating a default rule filling in a

dummy value for 1 and continuing to use rule (44)). Now we assume that Pred in the sentence in (45) has an unspecified value for the feature 1, and the translation proceeds as in (48).



The pair  $\langle 1, \text{dead}'(b) \rangle$  represents a situation-type, the type of situation characterized by Billy being dead. This is what the sheriff is in a want-relation with. Some expressions do translate as states of affairs with specified values for 1, for example complements to perception and causative verbs, as I discuss in §5 below. But a phrase denoting such a state of affairs would be an inappropriate object of the verb *want*.

### 3.1.3. Translating the IP complement of *want* as a SoA

In general, infinitival complements to emotive verbs receive translations comparable to those of small clause complements. This might suggest that infinitival Infl bears an unspecified 1 feature, just as Pred does. However, this inaccurately predicts that infinitival IP complements to emotive verbs should be independent, which they are not, as indicated in (49). Examples with small clauses are given in (50) for contrast.

- (49) a. \* What they needed was the cat to be fed while they were gone.  
 b. \* It was Zeke to play the harmonica that we really hated.  
 c. \* All we want is the dog to speak Italian.  
 d. \* Pigs to be in the kitchen, I like.

- (50) a. What they needed was the cat fed while they were gone.  
 b. It was Zeke on the harmonica that we really hated.  
 c. All we want is the dog brushed daily.  
 d. Pigs in the kitchen, I like.

In other words, the IP complement to an emotive verb is dependent in the sense of Chapter 1, §3. Following the analysis of dependency developed there, we can assume that the IP complement to an emotive verb lacks some featural specification that is necessary for proper interpretation as a SoA. The obvious candidate is the 1 feature, since IPs are assumed to translate as formulas similar to the translations of small clauses. However, recall that head-chains as conceived in Chapter 1, §2 can only pass down specifications for features; if Infl is to gain a feature specification for 1 from the higher structure, then it must already bear the feature 1. But in §3.1.2 I suggested that simply bearing the feature 1 was sufficient for interpretation as a SoA.

There are a number of possibilities at this point. One is that the original translation rule for SoAs (rule (44)) was correct, and that in order for an XP to translate as a SoA it must have a value for 1; then we must postulate some abstract value for 1 which can be specified on Pred, perhaps by default; an IP will have to receive the same abstract value via head-chain from the higher verb. Another possibility is that 1 is itself a value for some other feature, call it  $\tau$ , and it is the feature  $\tau$  which should be invoked in the translation rule for SoAs. Then we could say that Pred bears the feature specification  $\tau:1$ , i.e. Pred has the value 1 for the feature  $\tau$ , and Infl bears the feature  $\tau$  but has no value specified for it. A value must be acquired from a higher point in the tree.

Choosing from among such formal options requires establishing what exactly it means for something to bear the feature 1, or be specified for it, and what it would mean for something to bear an 'abstract' value for 1, and what the feature  $\tau$  might signify. In §3.2 I follow Kratzer 1989 and Diesing 1992, inter alios, in assuming that stage-level predicates, which are characterized by their impermanence, bear the feature 1, while individual-level predicates, which are characteristically inherent properties, do not. There, some observations about the different possibilities for predicates embedded under emotive verbs lends

independent evidence to the notion that Infl bears an unspecified feature which, once specified, allows it to be interpreted as a SoA.

### 3.2. Stage-level and Individual-level predicates

In this section I discuss some previous work which does not directly address the difference between emotive and propositional verbs but which bears on the analysis at hand.

Milsark (1974, 1977) identified two types of predicate, which he called STATES (or STATE-DESCRIPTIVE predicates) and PROPERTIES. Carlson's (1977) terms, STAGE-LEVEL (SLP) and INDIVIDUAL-LEVEL (ILP), are by now better known, so I will adopt them. The ILP/SLP distinction has attracted great interest, recent work including Stump 1985, McNally 1992, 1993, Jelinek 1992, Condoravdi 1992, Raposo & Uriagereka 1993, Herburger 1992, Schmitt 1992, Chierchia 1992. For an extensive review of previous proposals, see Fernald 1994.

The most intuitively obvious distinction is that stage-level predicates (like those in the examples in (51)) are typically transitory relations or states of affairs, while individual-level properties (like those in (52)) are typically more permanent.

- (51) a. Jane is sitting in a chair.
- b. Jane is speaking French.
- c. Jane is available.

- (52) a. Jane has green eyes.
- b. Jane knows French.
- c. Jane is an engineer.

This sense of transitoriness has been formalized in several ways in different works. Carlson 1977 proposes a system whereby ILPs predicate over individuals, but SLPs predicate over 'stages' of individuals, where a stage is a sort of temporal 'slice' of an individual. The distinction, then, lies in the semantic type of the predicate. I will discuss some other proposals immediately below.

Milsark showed that subjects of ILPs necessarily have a 'strong' interpretation; this is not to say that they must be 'strong DPs' in the sense that they must have definite determiners or universal quantifiers; but if they are indefinite they are interpreted in a 'strong' sense, as quantifiers rather than as (what Milsark termed) 'cardinal' expressions. Thus, in (53a) (from Milsark 1974:213), where the predicate is an SLP, the subject can have a 'strong' or 'partitive' reading, where it is pronounced /sʌm 'pipl/, primary stress on the determiner, or a 'weak' or 'existential' reading, where it is pronounced /sm 'pipl/, the determiner

unstressed (cf. Postal 1969). In the ILP construction in (53b), only the strong reading is possible.

- (53) a. Some people are sick.
- b. Some people are tall.

The crucial fact to be accounted for is that weak subjects do not occur with ILPs; that is, there is a 'gap' in the paradigm in (54).

- (54) a. Strong subj. + SLP: Everyone is dancing
- b. Weak subj. + SLP: People are dancing.
- c. Strong subj. + ILP: Everyone is beautiful.
- d. Weak subj. + ILP: \* People are beautiful. (\*on exist'l.  
reading)

Kratzter 1989 and Diesing 1988, 1990, 1992, have made some proposals concerning deriving the pattern in (54) from other properties of ILPs and SLPs. In this regard, two questions can be distinguished: first, what is the correct characterization of the distinction between SLPs and ILPs, i.e. in what sense do SLPs represent more 'transitory' properties? Second, what accounts for the pattern in (54)?

The first question does not as of yet have a rigorous formal answer, nor do I attempt to provide one here. Kratzter 1989 (building on Diesing 1988) argues that SLPs, but not ILPs, have a 'Davidsonian' argument in their argument structure, and suggests that this is a feature of predicates that are associated with some spatiotemporal location. It is worth noting that this is not quite compatible with Davidson's original proposal (see Davidson 1967a) that non-stative predicates have an event argument, since there are stative SLPs (such as *available*). For Kratzter, the event argument (which she represents as l) is a theta-role and can be assigned to an argument position, though apparently not to an actual noun phrase. Diesing 1992 also makes use of the notion that SLPs are characterized by being spatiotemporally located in a way that ILPs are not (see also Chierchia 1992 for an expression of this). Following this intuition, I will assume that SLPs bear the feature l and that ILPs do not, as a primitive distinction; that is, *available* is borne from the lexicon with a l feature (though perhaps not a specification for it), while *intelligent* has no l feature. This assumption is problematic, partly because of the difficulties of establishing what predicates are SLP and which are ILP; see Fernald 1994 for discussion.

In tackling the second question, Diesing 1992 suggests that there are two different types of Infl. One sort of Infl, which we might call Control Infl, takes as its complement an individual-level predicate with a PRO subject and assigns a θ-role to SpecIP, while the other sort of Infl,

which we might call Raising Infl, takes a stage-level predicate with an overt subject, and assigns no θ-role. Given the existence of a feature I borne by SLPs and not ILPs, we can formalize this in terms of c-selection: Raising Infl c-selects an XP with the feature I (we will see shortly that it is not also necessary to assume that Control Infl c-selects an XP without the feature I).

In (56a), The D-structure of (55a) is represented; the verb *are* presumably moves into Infl at S-structure, following standard assumptions. The predicate is simply labeled "ILP." In (56b), the D-structural representation for (55b) is shown; at S-structure, the subject in the Spec of the stage-level predicate raises to SpecIP (the examples are from Diesing 1992:16).

- (55) a. Brussels sprouts are unsuitable for eating.
- b. Carpenter ants destroyed my viola da gamba.
  
- (56) a. [IP brussels sprouts Infl<sub>C</sub><sup>0</sup> [ILP PRO are unsuitable for eating]].
- b. [IP Infl<sub>R</sub><sup>0</sup> [SLP carpenter ants destroyed my viola da gamba]].
- c. [IP carpenter ants; Infl<sub>R</sub><sup>0</sup> [SLP t; destroyed my viola da gamba]].

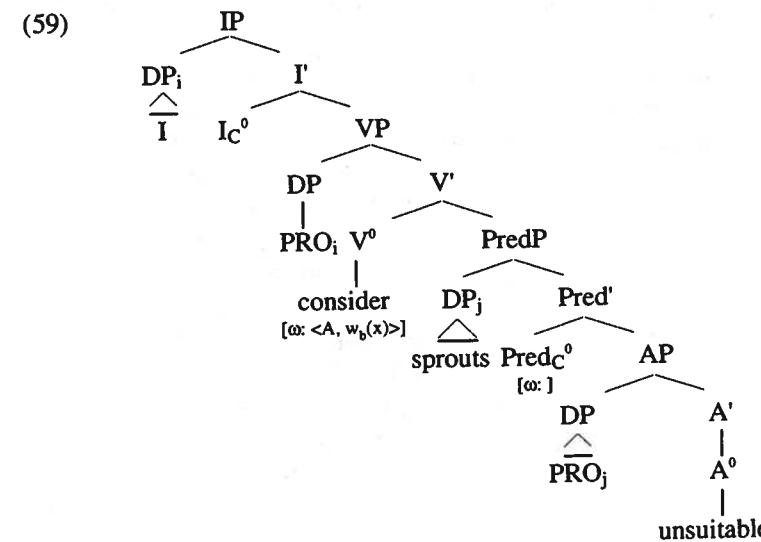
According to Diesing, existential closure in the sense of Heim 1982 occurs at the VP level (an existential quantifier is introduced, and binds all unbound variables). Since the trace of the subject in (56c) is caught under the scope of the existential quantifier, it can have a weak construal (Diesing assumes that the subject is optionally lowered to the position of its trace by reconstruction). The subject in (56a) has no trace in VP, however, and must therefore have a strong construal. However, the contrasts noted appear at the small clause level as well, as Raposo & Uriagereka 1993 point out.

- (57) a. I consider brussels sprouts unsuitable for eating.
- b. I want carpenter ants in my viola da gamba.

The small clause subject in (57a) can only be interpreted as strong, while the subject in (57b) can be weak (in fact the weak reading is the only plausible one). We could import Diesing's analysis directly into Bowers' if we assumed that there are two types of Pred, Control Pred (Pred<sub>C</sub>) and Raising Pred (Pred<sub>R</sub>). Assume for the moment that consider-type verbs c-select Control PredP, and want-type verbs c-select Raising PredP. The structures would be as in (58).

- (58) a. I consider [PredP brussels sprouts Pred<sub>C</sub><sup>0</sup> [ILP PRO unsuitable for eating]].
- b. I want [PredP Pred<sub>R</sub><sup>0</sup> [SLP carpenter ants in my viola da gamba]].
- c. I want [PredP carpenter ants; Pred<sub>R</sub><sup>0</sup> [SLP t; in my viola da gamba]].

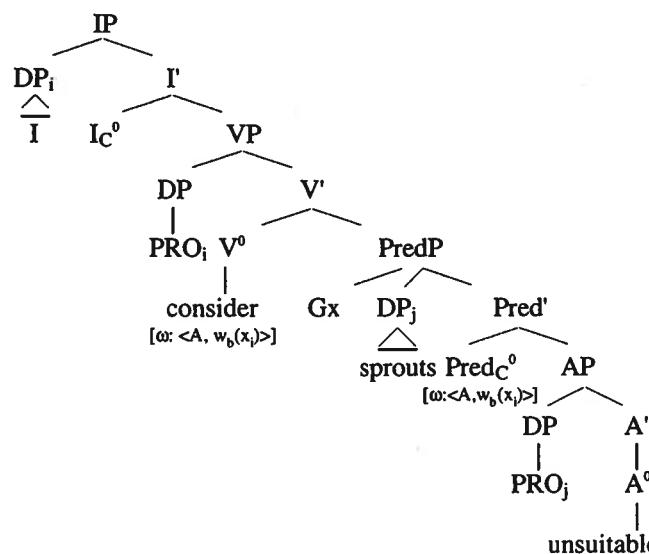
On this view, Infl is Pred with some additional featural specifications, for example Tense (recall from Chapter 1, §3 that Infl was held to be specified for a feature corresponding to Reichenbach's 1947 'S'). The primary function of Infl, and of Pred, is to facilitate predication. This function is seen in its 'pure' form in structures like that in (58a), where Pred simply predicates the property of being unsuitable for eating of the DP *brussels sprouts*. If existential closure is assumed to occur below the level of Pred, then the subject of the want-type SC should have a weak reading, and the subject of the consider-type verb should not, as desired. A couple of step-by-step translations might be illuminating at this point. An S-structure tree for example (57a) (abbreviated slightly) is given in (59). An LF tree is given in (60), and the translations for the nodes of the tree in (60) are given in (61).



In the S-structure tree in (59), *consider* has a  $\omega$  feature specification, but Pred has only the  $\omega$  feature, with no specification, consistent with the observations about  $\omega$  feature specifications in Chapter 1, §3. The PRO

subject of the AP is coindexed with its controller, as is the PRO subject of the VP (assuming that the main clause Infl happens to be Control Infl). This tree is converted into the LF representation in (60) below.

(60)



In (60), the  $\omega$  feature specifications have been copied onto Pred via a head-chain, as discussed in Chapter 1. The other change that has been made is that a Generic operator, G, has been added to the embedded PredP, following Diesing 1992, in the manner of Heim's 1982 Quantifier Construal (alternatively, we could assume that the generic operator is introduced only at the root level, without affecting the entailments of the translation).

For the logical translation of the LF tree in (60), a few complications have to be introduced which I was able to ignore in the translations in Chapter 1. First, in order to deal with the VP-internal subject, intransitive predicates must translate as type  $\langle e, nf \rangle$ , and transitive predicates as  $\langle e, \langle e, nf \rangle \rangle$ . This means that the subject argument will be represented in the denotation of the VP. When the predicator combines the subject with the VP, no new argument is actually introduced; the subject in SpecIP is understood to be identical with the subject trace or PRO in SpecVP; this is represented in the syntactic tree by coindexing. I will assume that a functor of the form  $\lambda x[\text{verb}'(y)](x)$ , applied to an element z coindexed with y, yields the structure  $[\text{verb}'(z)]$ . I will represent PRO and trace as indexed variables, while realizing that

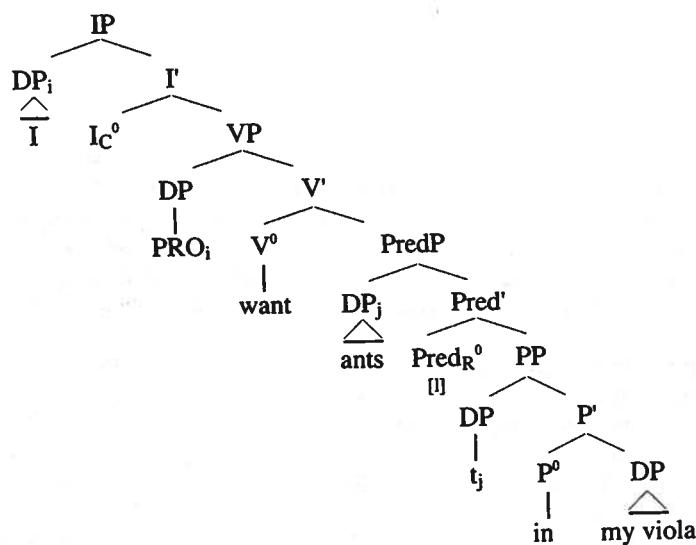
there are problems with generally equating traces with variables. Finally, I will assume a set of mapping rules that map the DP subject of a nexus XP into the restriction of the quantifier under XP (as in Heim 1982, Diesing 1992). Given these assumptions, we have the step-by-step translation in (61) for the right-hand nodes of the tree in (60), starting from the bottom.

- (61) a.  $A^0 \rightarrow \lambda x[\text{unsuitable}'(x)], \langle e, nf \rangle$
- b.  $AP \rightarrow \text{unsuitable}'(x_j), nf$
- c.  $\text{Pred}' \rightarrow \lambda y[\text{unsuitable}'(x_j)](y), \langle e, t \rangle$
- d.  $\text{PredP} \rightarrow Gx_j:\text{sprouts}'(x_j)[\text{unsuitable}'(x_j)], t$
- e.  $\text{PredP} \rightarrow A(w_b(z), \wedge Gx_j:\text{sprouts}'(x_j)[\text{unsuitable}'(x_j)]), i$
- f.  $V' \rightarrow \lambda z[\text{consider}'(z, A(w_b(z), \wedge Gx_j:\text{sprouts}'(x_j)[\text{unsuitable}'(x_j)])), \langle e, nf \rangle]$
- g.  $VP \rightarrow \text{consider}'(z_i, A(w_b(z_i), \wedge Gx_j:\text{sprouts}'(x_j)[\text{unsuitable}'(x_j)])), nf$
- h.  $I' \rightarrow \lambda w[\text{consider}'(z_i, A(w_b(z_i), \wedge Gx_j:\text{sprouts}'(x_j)[\text{unsuitable}'(x_j)]))(w), \langle e, t \rangle]$
- i.  $IP \rightarrow \text{consider}'(i, A(w_b(i), \wedge Gx_j:\text{sprouts}'(x_j)[\text{unsuitable}'(x_j)])), t$
- j.  $IP \rightarrow A(w_R, \wedge \text{consider}'(i, A(w_b(i), \wedge Gx_j:\text{sprouts}'(x_j)[\text{unsuitable}'(x_j)]))) \wedge A(w_b(i), \wedge \text{consider}'(i, A(w_b(i), \wedge Gx_j:\text{sprouts}'(x_j)[\text{unsuitable}'(x_j)]))), i$

In (61d), the PredP is translated into a formula, type t. But since this PredP bears a  $\omega$  feature specification, the rule for information units maps it onto the information unit in (61e). The same thing occurs in (61i-j), though I have not indicated the  $\omega$  feature specification on the root Infl in the tree. This information unit contains instructions about updating the context set used by the participants in the discourse. Specifically, it says that the proposition that sprouts are unsuitable should be added to the speaker's belief-set (the speaker is identified in (61j) with the constant  $i$ ), and that the proposition that  $i$  believes that sprouts are unsuitable should also be added to  $i$ 's belief-set; and finally, that the proposition that  $i$  believes that sprouts are unsuitable should be added to the common ground.

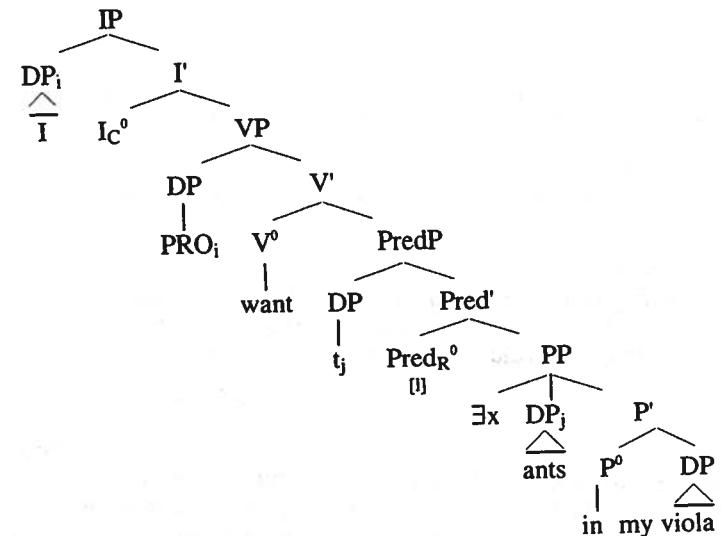
Now, for comparison, I provide a sample derivation of (57b). The S-structure tree is given in (62).

(62)



The only significant difference in the structure is that there is no PRO subject in the complement of Pred; instead there is a trace left from the DP *ants*. There is also a difference in the featural specification: no  $\omega$  feature is represented, but Pred bears the 1 feature. The LF tree is given in (63).

(63)



In (63), two changes have been made from the tree in (62). First, an existential operator has been added to the PP, following Diesing's suggestion that Existential Closure (in Heim's 1982 sense) occurs at the level below the predicator. Second, the DP *ants* has been lowered into the SpecPP position under reconstruction (cf. May 1977, 1985). I have represented the SpecPredP position as being occupied by a trace; for discussion of whether lowering under reconstruction leaves a trace, see May 1985, Chomsky 1991, 1993. The translation proceeds as in (64), assuming that the DP in SpecPP is mapped into the restriction of the existential quantifier (for Diesing, the DP caught under existential closure maps into the nuclear scope, giving an equivalent translation).<sup>17</sup>

<sup>17</sup> I am glossing over the question of what it means for the predicator to predicate a completely saturated function-argument complex of the trace of the lowered subject (step e in the derivation); as it stands, this is incoherent. Following the spirit of Kratzer 1989, de Hoop 1992, Raposo & Uriagereka 1993, and Ladusaw 1994, I assume that the function-argument complex (the nf, in Chierchia's terms), is predicated of a spatiotemporal location, construed as part of a world. This point is taken up again briefly in §3.4 below.

- (64) a.  $DP \rightarrow v, e$   
 b.  $P' \rightarrow \lambda x[in'(x, v)], <e, nf>$   
 c.  $PP \rightarrow \exists x:ant'(x)[in'(x, v)], nf$   
 d.  $Pred' \rightarrow \lambda y[\exists x:ant'(x)[in'(x, v)](y), <e, t>$   
 e.  $PredP \rightarrow \exists x:ant'(x)[in'(x, v)], t$   
 f.  $PredP \rightarrow <l, \exists x:ant'(x)[in'(x, v)]>, e$   
 g.  $V' \rightarrow \lambda z[want'(z, <l, \exists x:ant'(x)[in'(x, v)]>), <e, nf>$   
 h.  $VP \rightarrow want'(z_i, <l, \exists x:ant'(x)[in'(x, v)]>), nf$   
 i.  $I' \rightarrow \lambda w[want'(z_i, <l, \exists x:ant'(x)[in'(x, v)]>)(w), <e, t>$   
 j.  $IP \rightarrow want'(i, <l, \exists x:ant'(x)[in'(x, v)]>), t$   
 k.  $IP \rightarrow A(w_R, want'(i, <l, \exists x:ant'(x)[in'(x, v)]>)) \wedge A(w_b(i), want'(i, <l, \exists x:ant'(x)[in'(x, v)]>)), i$

This is the existential reading for (57b). There is another, highly implausible reading, represented in (58c), where *ants* (*carpenter ants*) has a generic reading (compare *I want ants banished from the kingdom*, where the generic reading is plausible). This reading results when *ants* is not reconstructed back into SpecPP. This means that it cannot be caught under existential closure, and is instead bound by a generic operator introduced at a higher level, as in (60) above.

Thus, there are three important pieces to the account. One is that there is existential closure below Pred (a generalization of Diesing's claim that existential closure takes only the VP in its scope). A second is that the subject, at least in some cases, is at some level of representation below the level of existential closure, i.e. in the projection of the lexical head, as in the LISH discussed in Chapter 1, §1. The third key piece is that there are two different kinds of Pred, one of which assigns a θ-role to its subject position, and the other of which does not. It is also important that consider-type verbs not appear with Raising PredP complements, a fact which I explained above by assuming that consider-type verbs c-select Control PredP. In §3.4 below I will argue that this assumption is not necessary.

One consequence of the account developed here is that it provides a solution for a problem for the Theta Criterion raised in Chapter 1. Recall the various cases discussed by Heycock 1991 in which a subject fails to be θ-marked by a lexical head (reviewed in §1.5 in Chapter 1). All of these cases turn out to require Control Infl, in that the subjects are necessarily construed as strong (as Heycock notes).

- (65) a. Pigs are tough to load onto the wagon.  
 b. Cats are Max's best friends.  
 c. Rabbits look like they're playing.

In each of the examples in (65), an existential reading for the bare plural subject is impossible (Heycock asserts that this is true for Japanese multiple subject constructions as well). If we follow Diesing in assuming that Control Infl assigns a θ-role, then the structures in (65) do not violate the Projection Principle (though they still serve to invalidate the LISH, in its strongest form).

However, recall that I suggested in Chapter 1 that there is no empty argument position in the predicates in (65); this would suggest that 'Control Infl' does not really require a PRO to appear in the predicate.<sup>18</sup> Instead, it can take any property, including a saturated predicate-argument structure, and turn it into a predicate. This is exactly the function of Bealer's Δ, or Chierchia's ∪, or Bowers' Pr, as originally conceived (cf. Chapter 1, §1; it was upon these concepts that the *Pred* used here was based). What, then, about 'Raising Infl'? Diesing suggests that it takes a stage-level predicate as its complement (here, Raising Pred c-selects an XP with the feature l) and assigns no external θ-role. If it assigns no external θ-role, then either something will have to move into its subject position, since it is a predicator, or an expletive will appear there. The result is that whenever Raising Infl takes a referential subject, its complement must be an unsaturated predicate.

Notice that although it is important that Raising Infl not allow ILPs, it is not particularly vital to the analysis that Control Infl not appear with SLPs. In what follows, I will take the possibility of a weak subject as the crucial diagnostic for the presence of Raising Infl. If a weak construal is impossible, we must have Control Infl, or Control Pred in a small clause.

### 3.3. SoAs with different predators

We now have a rich inventory of predators: Control Infl, Raising Infl, Control Pred, and Raising Pred. We know that the subject of a Control predicator must have a strong construal (following Diesing, this is because the scope of existential closure is below the level of the

<sup>18</sup> Diesing argues that quantifier float in the Control Infl predicate motivates the presence of PRO, e.g. in *They have all known French for years*. Floated quantifiers appear with the non-θ-assigning structures as well: *I consider them all tough to get along with*. However, floated quantifiers do not appear in the predicate itself, only to the left of the predicator: *I regard them {all} as {\*all} Max's friends*.

predicate), and we know that a Raising predicate takes a SLP complement (i.e. a complement with the feature l). This means that Infl in (66a) is Control Infl, Infl in (66b) is Raising Infl, Pred in the small clause in (66c) is Control Pred, and Pred in (66d) is Raising Pred.

- (66) a. Jorunn is a carnivore.
- b. Dogs knocked over my garbage cans last night.
- c. I consider Jorunn a carnivore.
- d. I heard dogs knock over my garbage cans last night.

I have been assuming that the distribution of the two kinds of Pred versus the two kinds of Infl has to do with the presence in Infl of verbal inflectional features which Pred does not bear. But the distribution of the two different kinds of Pred is not identical. Individual-level predicates are not usually good in SoA-denoting SCs, as shown in (67).

- (67) a.\*? I want Max intelligent.
- b. \* I like Gorbachev an actor.
- c. \* They hate dogs disloyal.
- d.\*? We need the car bigger.

It is well-known that typically individual-level predicates can take on a stage-level sense in some contexts; accordingly, an example like (67a) is acceptable in a context where Max's intelligence is variable. But with an individual-level reading, the sentences in (67) are deviant.<sup>19</sup> I suggested

<sup>19</sup> However, such examples improve, sometimes dramatically, if they are constructed so that an irrealis mood is created, or multiple instantiations are introduced, though DP predicates still resist this use. Inherently irrealis verbs like *imagine* are especially good, even without extra contextualization forcing the irrealis sense.

[i] a. I plan to have lots of kids, and when I do, I want them {intelligent/?Republican/ ?successful doctors}.  
 b. I like my boyfriends {tall/?Republican/\*doctors}.  
 c. Imagine Reagan {bald/?a basketball player}.

In [ib], the only possible reading is one involving generic reference to situations; it cannot be read as factive (compare *I like Your Holiness in red*, addressing a red-clad Pope). It seems implausible that a stage-level reading is being introduced in the good examples in [i], since *intelligent*, *tall*, and *bald* are not being treated as if they did not hold over their subjects in a permanent way (compare *Max is being intelligent*, where a stage-level sense of *intelligent* licenses the progressive). Safir 1993 argues that irrealis mood licenses a null Infl in perception verb complements, licensing non-stative verbs, expletives, and a sense of temporal independence. For Safir, following Higginbotham, absence or presence of Infl corresponds to the absence or presence of a temporal binder for the event argument *e*. The null Infl shields the *e* in the lower V from being bound by the matrix Infl. Translating this into our own terms, we could

(continued next page)

in §3.1.2 above that the PredP complement to *want* bears the feature l, and I suggested in §3.2 that Raising Pred c-selects a complement with the feature l. If we assume that Pred has l when and only when it has a complement with l, then the data in (67) are already accounted for: the ILPs there have no l feature, following (in essence) Kratzer 1989 and Diesing 1992, and the PredPs have no l feature either. The badness of the examples in (67) is accounted for by the requirement (formalized in the rule in (47)) that SoA-denoting expressions have the l feature. We can assume in general that Control Pred does not have the feature l.

Contrast the examples in (67) above with the examples in (68) below, where infinitival IPs appear in place of the small clauses. All individual-level predicates are freely licensed.

- (68) a. I want Max to be intelligent.
- b. I like Gorbachev to be an actor.
- c. They hate dogs to be disloyal.
- d. We need the cook to know Spanish.

The ILPs in the examples in (68) indicate that the infinitival IPs are headed by Control Infl. This is confirmed by the fact that indefinite subjects in such constructions must have a strong construal.

- (69) a. I want firefighters to be intelligent.
- b. We need {some/\*sm} employee to know Spanish.

But the fact that the IPs in (68-69) are licitly translated as SoAs indicates that Control Infl, unlike Control Pred, has the l feature. Note that weak-construal subjects are possible with SLPs in this context, indicating that Raising Infl also has the feature l.

- (70) a. I want firefighters to be available.
- b. I like important people to behave like ordinary folks.
- c. They hate dogs to bark while they're working.
- d. We need sm employee to sing in Spanish.

However, recall from §3.1.3 that the infinitival complement to an emotive verb is dependent, indicating that it does not have the necessary featural endowments for translation into an SoA. In other words, if the infinitival

say that the kind of irrealis sense (or generic reference to multiple instantiations of a having of a property?) exemplified in [i] exceptionally creates in an ILP a spatiotemporal location variable l which satisfies the requirement that a state of affairs have one (it allows raising Pred to take an ILP); alternatively, we could say that Control Pred, in an irrealis context, can exceptionally have l.

IPs in (68-70) have the feature  $\mathbf{l}$ , they must receive it via head-chain. I noted in §3.1.3 that the definition of head-chain only allows the specification of values for a feature that a head already bears, and has no value for.

What is needed, then, for this account to move forward, is some independently motivated feature appearing on infinitival Infl which is not specified inherently but must be specified from above, and which could be taken to fulfil the function of a spatiotemporal location in the construction of a SoA. There is, fortunately, such a feature. As noted above, the primary difference between Infl and Pred is taken to be the existence in Infl of certain verbal features, for example Tense. This must apply to infinitival Infl as well, as it is demonstrably distinct from Pred (cf. Stowell 1982, McCawley 1971 on Tense in infinitives). Recall from Chapter 1, §3 that tense can be modelled as a relation between two points (or intervals) in time: what Reichenbach 1947 called point-of-speech and point-of-reference. Furthermore, I suggested there that Infl might receive its specification for  $t_s$  from some higher node in the tree; this is also plausible for infinitivals. Consider the sentences in (71).

- (71) a. I remembered to turn off the gas.
- b. I will remember to turn off the gas.

The evaluation of the time of the infinitival is determined by the time-frame established in the main clause. In general, infinitivals can be characterized as expressing some sort of ‘unrealized’ tense; in Reichenbachian terms, R is unrealized at S. Let me assume, then, that there is some feature  $\tau$  (perhaps to be equated with the  $t_s$  of Chapter 1) which infinitival Infl bears, but without a value for. Some higher element in the tree, either the emotive verb or the higher Infl, bears a specification for  $\tau$  which allows the infinitival IP to be interpreted as a SoA. There is a certain rationale in this move, as the Tense features have to do with time, and the spatiotemporal location that characterizes a state of affairs also has a time component. Furthermore, the tense of an infinitival is ‘unrealized,’ and the spatiotemporal feature of a situation-type is ‘unlocated.’ I will take it as a plausible stipulation, then, that an XP with the feature specification  $\tau:\text{UN}$  (for ‘unrealized’) can be interpreted as a SoA, and that an infinitival IP complement to an emotive verb can receive the specification UN for the feature  $\tau$  via head-chain, enabling that IP to be translated as a SoA by rule (47), repeated below in (72), along with the equation in (73).

- (72) If S translates as  $\sigma$ , type t, and S bears a  $\mathbf{l}$  feature specification  $\alpha$ , then S corresponds to a state of affairs of the form  $\langle\alpha, \sigma\rangle$ , type e.

- (73) The feature specification  $\tau:\text{UN}$  is a  $\mathbf{l}$  feature specification.

Various methods might be employed to unify the two cases; for example,  $\mathbf{l}$ , rather than UN, might be taken to be a possible value of  $\tau$ . Alternatively, UN might be a value of  $\mathbf{l}$ . I will leave the rules in the admittedly awkward form in (72-73), as I think the intuition behind them is clear enough.

A fuller picture is now emerging of the various predators. Infl, but not Pred, has verbal inflectional features, including  $\tau$ , which we can take to be a Tense operator. If the  $\tau$  feature is specified with a particular sort of value, then IP can be translated as a SoA. We also know that Raising Pred, but not Control Pred, bears a  $\mathbf{l}$  feature. Thus, of the four predators, all but Control Pred can head a constituent which is interpreted as a SoA, but only Raising Pred can head independent SoA-denoting constituent.

Now consider the examples in (74), where the complement to the verb is a CP.

- (74) a. I want for Max to be intelligent.
- b. We need for the cook to know Spanish.
- c. I like for Gorbachev to act in films.
- d. They hate for dogs to be disloyal.

As noted in Chapter 1, such CPs are independent (cf. *What I really want is for Max to be intelligent*). On the current account, we can simply assume that *for* is specified as  $\tau:\text{UN}$ . This value can be supplied via head-chain to the IP, which can then be translated as a state of affairs.

#### 3.4. Propositions from different predators

Of the four different species of predators, I suggested in the last section that three could head constituents that denote SoAs, namely the two Infls and Raising Pred. A natural question at this point is which predators can head constituents that denote propositions or information units? First, we can establish that both Infls can, since IPs with weak subjects and IPs with ILPs are licit in main and subordinate contexts with propositional interpretations. This is illustrated in (75), where the weak reading of *students* in (75a) and (75c) indicates that the Infl there is Raising Infl, and the ILP *underpaid* in (75b) and (75d) indicates that Infl is Control Infl.

- (75) a. Students rioted last night.  
 b. Students are underpaid.  
 c. I believe students to have rioted last night.  
 d. I believe students to be underpaid.

This is consistent with the discussion in Chapter 1, §3, where it was suggested that in order to be interpreted as an information unit, a constituent must bear a specification for the anchoring feature  $\omega$ . Infl always bears the  $\omega$  feature. Main clauses receive anchoring specifications via the Root Rule, and subordinate clauses like those in (75c-d) receive anchoring specifications via head-chains from the epistemic verb *believe*.

Now consider the possibility of forming an information unit-denoting phrase with Pred as its head. This is certainly possible with Control Pred, as the examples in (76) show, as they contain ILPs.

- (76) a. I consider Gorbachev intelligent.  
 b. We proved the evidence fabricated.  
 c. We regard John as an exotic dancer.<sup>20</sup>

We might suppose that Control Pred, like Infl, bears the  $\omega$  feature, meaning that it is the sort of thing that can potentially be modally anchored. However, it seems that Raising Pred is not licit as the head of an information unit-denoting small clause. The bare plurals in (77) do not have existential readings.

- (77) a. I consider unicorns in the garden.  
 b. The DA proved drugs in their possession.

The contrast is delicate, but the point is worth establishing, even at the risk of belaboring. Consider the already classic examples (adapted) from Kratzer 1989.

- (78) a. Firefighters are available  
 b. Firefighters are altruistic

(78a) has an existential reading, paraphraseable as ‘there are firefighters available’; (78b) has only a generic reading, meaning ‘firefighters are

<sup>20</sup> Notice that *as* with *like* in *We like John as an exotic dancer* has the effect of mapping the individual-level predicate *an exotic dancer* onto a stage-level predicate (the state of being an exotic dancer at some relevant time  $t$ ), following Katz 1993; but the *as* which appears with *regard* is not interpreted as stage-level in any way; the property of being an exotic dancer is attributed to John in the same way as with *consider*.

typically altruistic,’ not ‘there are firefighters who are altruistic.’ Now consider the examples in (79). To contextualize these examples, imagine a scenario where a building permit will not be issued for a new home on a rural southern California hillside unless the property owner can prove that there are firefighters available to combat a possible brush fire. The building authority asks (79a). The property owner argues that the fire station 30 miles away is well-connected to the area by paved roads, and utters (79b) or (79c).

- (79) a. # Can you prove firefighters available?  
 b. # I consider firefighters available  
 c. # We believe firefighters available to that area year-round

To my ear, these examples are not completely acceptable on an existential reading (but are good, though peculiar, on a generic reading, hence the #). Much better would be (80).

- (80) a. Can you prove firefighters to be available?  
 b. I consider firefighters to be available  
 c. I believe firefighters to be available to that area year-round

A clearer test for strong construals, unavailable in English, is the impersonal passive construction, where weak construed indefinites are required, and strong construals are impossible. This prevents Norwegian and Swedish *anse* ‘consider’ from appearing in impersonal passive constructions, as shown in (81a-b); but non-propositional small clause-taking verbs like *gjøre* ‘make’ can form impersonal passives, as shown in (81c).<sup>21</sup> (81d) (from Westergaard 1991) is included to show that *anse* (unlike the emotive verbs; cf. §2.2) can passivize normally.

- (81) a. \* Det blir ansett noen hus ødelagt. (Nor)  
 b. \* Det anses något hus förstört. (Swe)  
*there is.considered some houses destroyed*  
 c. Det ble gjort en ekspedisjon klar. (Nor)  
*there was made an expeditionary.party ready*  
*‘An expeditionary party was prepared’*

<sup>21</sup> Belletti 1988 uses the ungrammaticality of similar examples to argue that impersonal passives are made possible by the licensing of partitive Case under  $\theta$ -assignment; since *consider* does not assign a  $\theta$ -role to the DP, it cannot assign partitive Case. This argument cannot be extended to cases like (81c).

- d. Toril blir ansett kvalifisert for denne jobben. (Nor)  
*Toril is considered qualified for this job*  
 'Toril is considered qualified for this job'

I take it as established, then, that propositional small clauses are formed only from Control Pred and not from Raising Pred. This can be very simply captured in the current analysis by assuming that Raising Pred does not bear the  $\omega$  feature. As a result, a Raising PredP can never receive propositional anchoring, and cannot be interpreted as an information unit.

This gives us the following collection of properties for the four different predicators:

(82)	$\tau$ (tense)	$\theta$ -role	$\omega$ (anchor)	l (loc)
Infl <sub>C</sub>	yes	yes	yes	no
Infl <sub>R</sub>	yes	no	yes	no
Pred <sub>C</sub>	no	yes	yes	no
Pred <sub>R</sub>	no	no	no	yes

Only Infl has a tense operator. Control Infl and Control Pred assign an external  $\theta$ -role. Both Infls and Control Pred have the anchoring feature  $\omega$ , but only Raising Pred has the locational feature l. However, in the case of infinitival IP, a certain value for the tense feature  $\tau$  (namely, the value UN) is equivalent to an unspecified location feature l (by the rule stated in (73) above).

The properties of having a tense operator and of assigning a  $\theta$ -role can be thought of as definitional; if a predicator can be [ $\pm\tau$ ] and [ $\pm\theta$ ], then there are four possibilities, and all are represented. The distribution of the features  $\omega$  and l, on the other hand, requires some explanation. For instance, why it should be that Raising Pred is incompatible with modal anchoring? A possible explanation is that propositions must by their very nature be *about* something. Control Infl and Control Pred are such that they predicate a property of an individual; the individual is then the TOPIC of the proposition in something like Hockett's 1958 sense (see Vallduví 1990 for discussion of the various uses of this term; see also Raposo & Uriagereka 1993 for discussion germane to the point at hand). But a PredP headed by Raising Pred is not about anything; it is simply a nexus, an argument complex sufficient to denote a state of affairs (here I diverge from Raposo & Uriagereka's analysis, in which the PredP headed by Raising Pred (their Agr-T) is 'about' the event itself). This might help explain why Raising Pred does not have the anchoring feature, but it leaves one wondering why Raising Infl does have it. Milsark 1974:218 suggests a link between sentences with weak subjects (here, IPs headed

by Raising Infl) and the THETIC JUDGMENT of Brentano 1874 and Anton Marty, discussed in Kuroda 1972, Sasse 1987, and Ladusaw 1994 (but the 'thetic predication' of Raposo & Uriagereka 1993 corresponds more closely to my state of affairs). A thetic judgment is the assertion (or denial) that a particular state of affairs holds of the world; what it is about is the world itself. This is hinted at by the claim of Kratzer 1989 and de Hoop 1992 that the deep subject of sentences with weak-construal surface subjects is the Davidsonian event argument.<sup>22</sup> It seems that IP with Raising Infl can be used to assert that a state of affairs holds, while PredP with Raising Pred can only denote a state of affairs. This difference might be related to the presence in Infl of a tense operator, or it might constitute an additional distinction. See Ladusaw 1994 for discussion of the connection between Brentano's different modes of judgment and Milsark's observation about the asymmetric distribution of weak-reading subjects. Ladusaw's formulation provides a way of understanding why it might be that unselective existential closure should have the scope that it does, in Diesing's proposal (the scope being the VP) and in this revision of it (the scope being whatever lexical XP is the complement of the predicator).

The general idea, then, is that Control Pred is like Control Infl but without its Tense operator, and as such is still the basis for a proposition about some subject (a CATEGORICAL JUDGMENT, in Brentano's sense), and therefore has the anchoring feature. Raising Pred is like Raising Infl but without the Tense operator, and is therefore the basis for a description of a state of affairs. States of affairs are inherently associated with spatiotemporal locations, and since Raising Pred has no tense operator, it must have the spatiotemporal feature l. It might inherit this from its complement, which would explain the fact that Raising Pred seems to c-select a stage-level predicate; only an SLP can supply the l feature, as ILPs do not bear it.

<sup>22</sup> Such an analysis could be directly adopted into the present account. The formal representation would involve assuming that a lowered element does not leave a coindexed trace (cf. the tree in (63) above). This leaves no argument for the predicator to predicate (the denotation of) its complement of. A special rule is then posited inserting the Davidsonian event argument into the empty Spec position.

#### 4. The application of the analysis to the data

The core data treated in previous accounts, which we would also like the present account to treat, is sketched in (83) below, repeated from (18) in §1.3.

(83)		believe+IP	consider+SC	want+IP	want+SC
a. <i>for</i>		no	no	yes	no
b. PRO		no	no	yes	no
c. passive		yes	yes	no	no
d. reflexive		yes	yes	no	yes
e. displacement		no	no	no	yes
f. narrow scope		yes	no	yes	yes
g. null operator		no	yes	no	no

I discuss each of these patterns in the subsections below.

##### 4.1. The distribution of *for* and PRO

For the distribution of the complementizer *for* (the pattern displayed in (83a)), I follow in essence Bresnan 1972 and Chomsky 1981; *for* is not possible with verbs like *consider* and *believe* because the semantics are incompatible. In the current account, this is formally represented by the fact that *for* does not bear the  $\omega$  feature which encodes anchoring information. As a result of this, no IP embedded under *for* will ever be specified for anchoring features (recall from Chapter 1, §2 that in order for a head-chain to be formed, all members of the head-chain must bear the relevant feature). Without anchoring features, an element cannot be interpreted as an information unit, following the discussion in Chapter 1, §3. *For* does not appear with small clause complements to want-type verbs, and I will simply assume that this is because complementizers in English always c-select IP.

This means that the complementizer *for* heads a CP which is never interpreted as a proposition. Compare (84a) with (84b), from Bresnan 1970:297.

- (84) a. It may distress John for Mary to see his relatives.  
       b. It may distress John that Mary sees his relatives.

The contrast is subtle, but Bresnan points out that the two are not synonymous. In the terms adopted here, in (84a) the extraposed CP denotes a state of affairs; that state of affairs may or may not hold in the real world. In (84b), the extraposed CP denotes a proposition, which is presupposed true because of the anchoring supplied by the

complementizer *that* (as discussed in Chapter 1, §3). Bresnan 1970:302 points out that the non-synonymy of the examples in (84) is clearer when they are negated, as in (85).

- (85) a. It may not distress John for Mary to see his relatives.  
       b. It may not distress John that Mary sees his relatives.

The presupposition that Mary sees John's relatives is preserved in (85b), while (85a) clearly does not require that she ever have seen them.

In general, it seems that finite indicative clauses denote propositions, and non-finite clauses do not. In languages with a full-fledged subjunctive mood, subjunctive clauses may typically denote states of affairs, like for-CPs in English. ECM constructions, where non-finite clauses appear as complements to epistemic verbs, are an exception to this general cross-linguistic trend, as they involve non-finite clauses with propositional interpretation. The hypothesis under which I am operating is that this is made possible in English and other languages with ECM constructions by the formation of a particular kind of head-chain, namely a  $\omega$ -chain between the epistemic verb and an embedded non-finite Infl. If a language had no  $\omega$  feature in non-finite Infl, a propositional interpretation for a non-finite IP would be impossible.

I follow the GB account also for the distribution of PRO. PRO will in general be impossible in ECM contexts, including small clauses, because of government of the embedded subject position by the higher verb.<sup>23</sup> A special null complementizer is stipulated for controlled infinitival complements to emotive verbs such as *want*, *like*, *hate*, and so on. This complementizer does not govern, therefore allowing PRO, and is semantically incompatible with epistemic verbs (formally, it has no  $\omega$  feature). Nothing in this account prevents some language from having an overt non-governing complementizer. In fact Kayne 1981b suggests that French *de* and Italian *di* correspond to the null non-governing C° of English, in examples like the French one in (86a); the same might be said of Norwegian *for* 'for' and *til* 'to,' as in (86b-c), or Icelandic *um* 'about' or *til* 'to' as in (86d-e) (from Sigurðsson 1989:59 and 1991:337).<sup>24</sup>

<sup>23</sup> The same conclusion obtains if we assume that PRO can be governed but not properly head governed as in Sigurðsson 1991, or if we assume that PRO may be governed but must receive null Case as in Chomsky & Lasnik 1991 (then the null C° would be a null Case assigner; the assigner of null Case could not be the *want* verb itself or SCs would be falsely predicted to allow PRO subjects; cf. below).

<sup>24</sup> Carroll 1983 argues that in Ottawa Valley English examples with *for* to purpose clauses corresponding to the Norwegian (86b), *for* is a preposition and not a complementizer (though this would only make a difference if some distinction (continued next page)

- (86) a. Ce serait dommage de partir maintenant. (Fr)  
*it would.be pity for leave now*  
 'It would be a pity to leave now'
- b. Vi begynte å synge for å skremme bort ulven. (Nor)  
*we began to sing for to scare away the.wolf*  
 'We began to sing in order to scare away the wolf'
- c. Endelig fikk vi barna til å sitte stille. (Nor)  
*finally got we the.children to to sit still*  
 'Finally we got the children to sit still'
- d. María bað mig um að senda brefið. (Ice)  
*Maria asked me about to send the.letter*  
 'Maria asked me to send the letter'
- e. Strákana langaði til að komast allir í veisluna. (Ice)  
*the.boys wanted to to get all in the.party*  
 'The boys all wanted to get to the party'

Another feature of this account of the distribution of PRO is that nothing prevents a language from having a non-governing complementizer that is semantically compatible with epistemic verbs. This may be what is needed to account for the well-known Romance examples like the Italian one in (87a) or the French one in (87b) (both from Kayne 1980c, his exx. (43) and (69), respectively).

- (87) a. Gianni crede di essere intelligent. (It)  
*Gianni believes to be intelligent*  
 'Gianni believes himself to be intelligent'
- b. Je {crois/ reconnaît/ affirme} avoir fait une erreur. (Fr)  
*I {believe/acknowledge/affirm} have made an error*  
 'I {believe/acknowledge/affirm} myself to have made an error'

If this discussion is on the right track, then the Italian example in (87a) may involve an overt non-governing complementizer (if *di* is a complementizer), while the French example in (87b) must involve a null non-governing complementizer. I will not pursue issues germane to

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between them were postulated with respect to government; cf. Emonds' 1985 arguments that P and C are the same category). This would be a plausible analysis for the Scandinavian languages, in which prepositions regularly take clausal complements. Note also that Henry 1992 argues that *for* in Belfast English *I want for to go* does not govern PRO because it cliticizes to Infl, suggesting that perhaps an analysis is available in which no overt complementizers can govern PRO.

Romance complementation here; these matters are taken up in some detail in various of the papers collected in Kayne 1984, for example.

#### 4.2. Reflexives

One of the classic distinctions I listed above between want-type verbs and consider-type verbs had to do with reflexives. Bresnan 1972:162 suggests that examples like those in (88), with want-type verbs, are "jarring" (I follow her in indicating this degree of unacceptability with a single question mark).

- (88) a. ? Alice wants herself to learn karate.  
 b. ? Betty prefers herself to study aikido.  
 c. ? Catherine desires herself to become proficient at pushing hands.  
 d. ? Doris likes herself to practice Chinese Temple Boxing with her sister.  
 e. ? Edith loves herself to do T'ai Chi exercises.  
 f. ? Frances hates herself to waste her time on archaic martial arts.

In contrast, Bresnan notes, examples with believe-type verbs like those in (89) are perfectly acceptable (again from her 1972:162).

- (89) a. Al believes himself to have done the laundry enough.  
 b. Bill supposes himself to be a good cook.  
 c. Dave considers himself to be above mopping the floor.  
 d. Ed assumes himself to be living evidence that anatomy is destiny.

However, she also notes that judgments in this matter are variable (cf. her fn. 4, p. 189); in particular, examples similar to those in (88) are often judged acceptable, for example (90a) from Rosenbaum 1965:70, or (90b), which Bresnan attributes to Robin Lakoff (Bresnan, fn. 6, p. 190, disagrees with Lakoff's suggestion that (90b) is grammatical).

- (90) a. I desired myself to be an honest man.  
 b. I want myself to go.

Now, in Bresnan's account, examples like those in (88) are bad because of the null complementizer; the embedded subject is too far away from its antecedent to be bound by it. But note that the examples in (88) are not as bad as those in (91).

- (91) a. \* Alice hopes that herself will learn karate.  
 b. \* Doris knows that herself will buy a gun.

The examples in (91) are markedly worse than those in (88), but on Bresnan's account, they should be ruled out for exactly the same reasons. Note also that examples otherwise similar to those in (88) are acceptable with reciprocals.

- (92) a. Alice and Betty want each other to study karate.  
 b. Catherine and Doris like each other to buy ammunition.

Reciprocals are ordinarily assumed to be subject to the same binding conditions as reflexives. Why, then, do the examples in (92) contrast with those in (88)? The answer, I think, has to do with the availability of the control structures in (93), which are synonymous with the intended meaning of the corresponding sentences in (88).

- (93) a. Alice wants to study karate.  
 b. Doris likes to practice Chinese Temple Boxing with her sister.

Farkas 1992a argues that the availability of a control structure in certain Romance constructions blocks the use of a synonymous non-control structure using a coreferent pronoun. Extending that account to the English data, we could say that the availability of (93) blocks the use of (88); the control structure is the 'preferred' structure for expressing this meaning, and the reflexive structure can only be resorted to when no control structure is available, for example in (89), or in (92). An advantage of this account is that the marginal status of (88) and the outright ungrammaticality of (91) receive separate treatments.

Blocking phenomena have long been noted to exist in the morphological domain (e.g. the existence of the irregular plural *geese* blocks the formation of the regular plural \**gooses*; see, for example, Aronoff 1976 or Kiparsky 1982). The existence of blocking effects in syntax raises a number of questions (for some recent discussion, see Poser 1992). If (94a) and (94b) are synonymous, as they appear to be, then why does one not block the other?

- (94) a. Doris wants her sister to be dangerous.  
 b. Doris wants her sister dangerous.

One possibility is that (94a) and (94b) are not synonymous. There does seem to be some slight difference in meaning (see Borkin 1984 for extensive discussion of such contrasts). However, it seems that synonymy of structures does not entail that one will block the other. For example,

(95a) and (95b) are both possible, though they are certainly identical in interpretation.

- (95) a. Rush believes Bill is lying.  
 b. Rush believes that Bill is lying.

Thus it is crucial to distinguish alternatives like those in (95a-b), where both options are possible, from mutually exclusive alternatives like (88) vs. (93). The infinitival control structure (such as those in (93) above) does not block the small clause structure with reflexive, as illustrated in (96).

- (96) a. The sheriff wanted {the deputy/himself} sober for the parade.  
 b. Eglantine likes {Egbert/herself} in purple.

I have included non-reflexive subjects for comparison. There may be some preference, even here, for the infinitival control structure.

The overall conclusion is that in an infinitival complement, an overt subject coreferential with the main subject is dispreferred, often to the point of sounding ungrammatical, in a context where a controlled (PRO) subject is possible. The evidence does not support the postulation of a null complementizer in infinitival complements to want-type verbs in the general case.

#### 4.3. Passive

With respect to passive constructions, the classic observation (cf. Bresnan 1972:154ff.) is that the subject of the infinitival complement to a believe-type verb may be promoted when the believe-type verb is passivized, while the subject of the complement of a want-type verb may not be. This is illustrated in (97).

- (97) a. The left flank is believed to be covered (by the goalie).  
 b. \* The left flank is wanted to be covered (by the goalie).

I noted above that the account for this pattern given in Chomsky 1981 is that a subject embedded under a believe-type verb is properly governed by the believe-type verb and receives Case from it, while the subject embedded under a want-type verb is not, owing to the presence of a null complementizer (actually, the empty C° node which hosted the complementizer *for* prior to *for* deletion).

The GB account is compromised by the small clause data. If the passive construction in (97b) is prevented by the existence of a null complementizer between the passive verb and the NP-trace, then why is (98b) equally bad?

- (98) a. The goalie wants the left flank covered.  
 b. \* The left flank is wanted covered (by the goalie).

The GB account, which pins the badness of (97b) on a null complementizer, requires some additional account for (98b). Recall that there is no evidence for complementizers in English with small clauses in general, and if they were allowed we would lose our account for the badness of control structures with small clauses. I argued above that there was no null complementizer in ECM constructions with want-type verbs. This means that I need an independent account for the badness of (97b), and it is clear that it would be an advantage if that account also provided for the badness of (98b).

Here I will only outline such an account. The basic idea behind the account developed in §3 above is that the nexal complement to a want-type verb receives an interpretation as a state of affairs. When the complement is a small clause, the SoA interpretation is completely independent of the selecting verb. When the complement is an IP, it must be specified as having an ‘unrealized’ tense, which allows the IP to have an SoA interpretation. The specification ‘unrealized’ for the tense feature ( $\tau$ ) can come from any emotive verb or from the complementizer *for*. In fact, it is possible that all verbs that take infinitival complements are specified as [ $\tau$ :UN] for the purposes of determining the  $\tau$  value on the embedded infinitive; other factors may rule out a SoA interpretation in certain cases (for example the complement to believe-type verbs). In other words, that specification is not verb-specific; it may even be a kind of default value for verbs. This means that the  $\tau$  value is not centrally tied in any way to the lexical content of the verb.

Contrast this with the  $\omega$  feature specification borne by epistemic verbs. The verb *believe* was said in Chapter 1, §3 to be specified as [ $\omega$ : $\langle A, w_b(x) \rangle$ ], while *deny* was something like [ $\omega$ : $\langle \Delta, w_c(x) \rangle$ ]. The verb in each case determines the anchor (the belief-set, for *believe*, a claim-set, for *deny*), and also the mode of anchoring (assertion, or addition to the belief-set in the case of *believe*, versus denial, or addition of the contradiction to the claim-set in the case of *deny*). Furthermore, there is an inherent connection between the  $\omega$  specification and the verb’s argument structure, as the variable  $x$  in the specifications must ultimately refer to the subject of the verb. This means that the  $\omega$  feature is a fundamental part of an epistemic verb’s lexical identity. When this feature specification is passed down to a lower head, the two are intimately connected. I propose that it is this intimate connection that makes it possible for an argument of the lower head to be raised to a position in the higher structure under passivization (or raising, in constructions like *He proved (to be) overqualified*).

The SoA-denoting nexus, not so intimately connected with the higher verb, is in a sense opaque; arguments contained within that nexus are not ‘visible,’ for example, to the argument structure of the emotive verb. Compare the situation with a noun phrase complement to a simple transitive verb like *arrest*; it is quite impossible to promote any subpart of a noun phrase into the higher structure under passivization.

- (99) a. They arrested Simpson’s friend.  
 b. \* Simpson’s was arrested friend.

Noun phrases in general can be said to be similar in this respect to nexal complements to emotive verbs; their interpretation is (nearly) complete, and they are therefore opaque to such operations as passivization (and raising; there are no emotive raising verbs, cf. \**He feared (to be) too early*).

These remarks are unfortunately at a rather speculative level. I hope to return to this topic in future research.

#### 4.4. Displacement

Recall the pattern for the application of constituency tests: infinitival complements to believe-type verbs cannot be displaced.

- (100) a. \* What they proved was the cat to have eaten the broccoli.  
 b. \* I believe more than anything the cat to have eaten my broccoli.  
 c. \* It was Zeke to play the harmonica that we understood.  
 d. \* The dog to speak Italian, nobody suspected.

This is unsurprising on the account adopted here, in which these complements are always IPs, and there is no null infinitive-taking C° semantically compatible with epistemic verbs. IPs can never be displaced, as they are always dependent on a higher node for C-features, as discussed in Chapter 1, §3.

Infinitival complements to want-type verbs may be displaced only if they are accompanied by *for*.

- (101) a. What they needed was \*(for) the cat to eat the broccoli.  
 b. I would like more than anything \*(for) the cat to eat my broccoli.  
 c. It was \*(for) Zeke to play the harmonica that we really hated.  
 d. All we want is \*(for) the dog to speak Italian.

Again, this is exactly the pattern expected if the presence of the complementizer indicates that the displaced constituent is a CP; CPs are

independent and receive a coherent interpretation even if displaced. The absence of *for* indicates that the clause is an IP; a (non-root) IP can appear only as the complement to some head which specifically supplies featural information allowing that IP to be interpreted.

Again, I am not following the GB account at this point; the standard GB account since Chomsky 1981 is that all embedded clauses have a complementizer at some point in their derivation, and that complementizers heading displaced CPs cannot be deleted, neither by S'-deletion nor by *for*-deletion. As noted in Chapter 1, Stowell 1981 argues that this follows from the ECP (empty categories must be properly governed), but Doherty 1993 shows several problems for that account.

#### 4.5. Narrow scope

The basic data regarding the scopal contrasts between consider-type verbs with small clause complements and all other structures is that consider-type verbs with small clause complements do not allow a narrow scope reading for a quantified embedded subject with respect to the higher verb. Some relevant data is given in (102) (repeated from (12) in §1; the original observation is due to Williams 1983).

- (102) a. John believes someone to be angry at him.
- b. John believes someone angry at him.
- c. Mary proved two assumptions to be false.
- d. Mary proved two assumptions false.

In (102a) and (102c), the quantified subject of the embedded nexus ambiguously scopes over or under the main verb, while in (102b) and (102d), the narrow scope reading is impossible. As discussed in §2, Stowell's 1991a explanation for this pattern involved LF head movement of the embedded predicative head to the main verb. I showed various problems for that account, for example with respect to coordinate structures. Here I will show how an alternative account is available.

Recall also that the pattern is different for want-type verbs, as in (103) (repeated from (13) in §1).

- (103) a. The boss wants someone to be arrested.
- b. The boss wants someone arrested.
- c. John needs two kinds of sugar to be in his coffee.
- d. John needs two kinds of sugar in his coffee.

Here all four examples have two readings; thus the emotive constructions pattern with the believe-type constructions, against the consider-type.

On Stowell's account, it will be recalled, the crucial point was that the consider-type small clause did not count as a domain for Quantifier Raising (QR). However, there is another way to look at the data. Recall from §3 that small clause complements to epistemic verbs were invariably headed by Control Pred, which was determined to bear the  $\omega$  feature, unlike Raising Pred. The reason behind this claim was that the subject of a proposition-denoting small clause was found to invariably have a strong construal. Following Diesing 1992, I assumed that this had to do with the scope of existential closure. Given this observation, the sentences in (102) have exactly the number of readings we expect them to have. The small clauses are headed by Control Pred, and their subjects have only strong readings, which are equivalent to wide-scope readings. The embedded IPs can be headed by either Control Infl or Raising Infl, and the narrow-scope readings for the quantified subjects in (102b) and (102d) are weak construal readings. In (103) on the other hand, the small clauses are headed by Raising Pred, and the subjects can have weak readings with wide or narrow scope. This result is not inconsistent with Stowell's restructuring account, but it removes an important argument for it.

#### 4.6. Null operators

Another set of data discussed in Stowell 1991a involves null operators. The basic observation is that gaps (in tough-constructions and parasitic gap constructions) which are analyzed as corresponding to the traces of null operators can appear in the position of the subject of a consider-type small clause, but not in the position of the subject of a believe-type infinitival. This is demonstrated in (104-105) below (cf. also (15-16) in §2 above); (105d) is from Stowell 1991a:205; as Stowell notes, the parasitic gap constructions are not as good as the tough-constructions in (105), for some unknown reason.

- (104) a. \* Shawn Eckardt is difficult for anybody to believe to be intelligent.  
       b. \* That kind of evidence will be easy to show to be invalid.  
       c. \* Which candidate did you support without really considering to be admirable?  
       d. \* Which defendant did the jury meet before finding to be guilty?
- (105) a. Shawn Eckardt is difficult for anybody to consider intelligent.  
       b. That kind of evidence will be easy to show invalid.  
       c. ? Which candidate did you support without really considering admirable?  
       d. ? Which defendant did the jury meet before finding guilty?

Now, Stowell's account holds that the subject position of the consider-type small clause is c-commanded at LF by the predicative head of the small clause; since that head is the θ-assigner for the subject of the small clause, this has the net result that the subject position of the consider-type small clause is θ-governed. No restructuring occurs with infinitival constructions. If θ-government is taken to be a crucial condition on null operator traces, then the pattern in (104-105) is accounted for.

The account, however, overgenerates. As I noted in §1 above, emotive verbs pattern with believe-type verbs in this regard, as illustrated in (106); there is no significant contrast there between clausal and small clausal complements.

- (106) a. \* Jeff Gillooly is easy to want (to be) arrested.  
       b. \* That kind of dog is difficult to like (to be) in the house.  
       c. \* Who do you despise without really wanting (to be) arrested?  
       d. \* That's the kind of evidence you can use without fearing (to be) refutable.

This fact can be assimilated into Stowell's proposal if it is assumed that want-type small clauses do not undergo restructuring. But there is a more serious way in which Stowell's account overgenerates, once certain theoretical assumptions are adopted. Recall that the VP-Internal Subject Hypothesis (ISH) holds that the subject in a sentence like that in (107a) originates in SpecVP; this is indicated in (107b).

- (107) a. The pig took a shower.  
       b. [IP The pig<sub>i</sub> [vp<sub>i</sub> took a shower]]

Recall also that in many languages, including French and Norwegian, the inflected verb (at least in main clauses) moves to a position outside the

VP, as indicated in (108) (the emphatic particle *jo* is assumed to be VP adjoined).

- (108) [cp Grisen<sub>i</sub> tok<sub>j</sub> [IP t<sub>i</sub> t<sub>j</sub> [vp jo [vp t<sub>i</sub> t<sub>j</sub> en dusj ]]]] (Nor)  
           *the.pig took indeed a shower*  
           'The pig did take a shower'

In fact, Chomsky 1993 argues that V movement to Infl also occurs in English, but at LF. At any rate, sentences like that in (108) involve exactly the same configuration derived by Stowell's restructuring: the θ-assigner for the subject has moved to a position from which it c-commands the base-position of that subject. In fact, if another element were placed in SpecCP, then the θ-assigner for the subject would c-command the subject at S-structure as well, as in (109).

- (109) [cp I går tok<sub>j</sub> [IP grisen<sub>i</sub> t<sub>j</sub> [vpjo [vp t<sub>i</sub> t<sub>j</sub> en dusj ]]]] (Nor)  
           *yesterday took the.pig indeed a shower*  
           'Yesterday, the pig did take a shower'

According to Stowell, then, this sort of configuration should license a null operator. V2 constructions can be embedded under certain verbs, as in (110a). But these contexts certainly do not allow null operator traces, as indicated in (110b-c).

- (110) a. Jeg tror at i går tok grisen en dusj. (Nor)  
           *I believe that yesterday took the.pig a shower*  
           'I believe that yesterday, the pig took a shower'  
       b. \* Grisen er vanskelig å tro at i går tok en dusj.  
           *the.pig is difficult to believe that yesterday took a shower*  
       c. \* Hvilken gris så du uten å tro at i går tok en dusj?  
           *which pig saw you without to believe that yesterday took a shower?*

Thus, the restructuring account for the distribution of null operator traces is too strong, predicting them to be licensed in places where they are not.

Informally, the distribution of null operators shows that the DP immediately following a consider-type verb is 'more like a direct object' than the DP following a believe-type verb or a want-type verb. This suggests an account based on the 'transparency' of a consider-type small clause, as I discussed briefly for the passive facts. I will not attempt a more fully fleshed out account, noting here only that certain questions remain about the distribution of null operators, but I think that the analysis outlined here is promising.

## 5. Perception verbs

Another class of verbs which appears with small clause complements is the class of perception verbs, including at least *see*, *hear*, and *feel*, and perhaps also several others. I argue in this section that like the want-type verbs, the complements to perception verbs are interpreted as SoAs, but unlike the SoA-denoting complements to want-type verbs, they are ‘located,’ in the sense that the l feature is specified.

The literature on perception verbs is extensive, and I will not attempt to summarize it here; I refer the interested reader to Akmajian 1977, Gee 1977, Barwise 1981, Barwise & Perry 1983, Higginbotham 1983, Dik & Hengeveld 1991, Safir 1993, and references cited in those works. What I will discuss is the semantic contrast among sentences like those in (111).

- (111) a. We saw Michelle Pfeiffer.
- b. We saw Michelle Pfeiffer leave.
- c. We saw that Michelle Pfeiffer had left.

The sentence in (111a) asserts something about the direct perception of an individual; that in (111b) has to do with the direct perception of an event; and (111c) says something about the apprehension of a fact, based on perception (what Dik & Hengeveld 1991:239 call “mental perception of a propositional content”). For the time being, we can refer to cases like these three as *see* with DP, SC, and CP, respectively.

The first use of *see* is unproblematic; it is a two-place relation between individuals. In (111b), what is seen is not an ordinary individual, but a higher-order entity (in the sense of Lyons 1977): a state of affairs, or SoA, on the account developed here (drawing most directly on Barwise 1981). In the Property Theory introduced in Chapter 1 (borrowed from Chierchia & Turner 1988), a very broad sense of entity-hood was adopted; it is fully consistent with that sense of entity-hood to say that states of affairs are entities.<sup>25</sup> This would allow us to accommodate the use of the verb *see* in (111b) without postulating two different verbs, by

<sup>25</sup> In fact, they must be, given that certain small-clauses which I have argued denote states of affairs appear as subjects (cf. Chapter 1, §3). However, it was noted in Chapter 1 that VP small clauses cannot typically be subjects, nor can they be displaced (though judgments vary to some degree; *What I saw was Captain Haddock drink a bottle of whiskey* is accepted by some speakers). This suggests another instance of dependency, namely that the verb which heads a complement to Raising Pred lacks some feature specification, and must receive it via head-chain from Pred.

simply saying that *see* in (111a-b) denotes a two-place relation between entities; the meaning of the verb will require that the subject be something that can see, and that the complement be something that can be seen.

I should briefly point out that I am not distinguishing the VP small clause in (111b) from the small clauses in (112); I assume each denotes a state of affairs, on one reading.

- (112) a. We saw Michelle Pfeiffer signing autographs.
- b. We saw Michelle Pfeiffer un-made-up.
- c. We saw Michelle Pfeiffer on the boardwalk.

Of course, each of these examples is ambiguous between a small clause reading, where what is perceived is a state of affairs, and a depictive reading, where what is perceived is Michelle Pfeiffer and the secondary predicate is an adjunct (cf. Chapter 1, §1).<sup>26</sup> The constructions in (113) admit only the small clause readings.

- (113) a. Michelle Pfeiffer signing autographs was the last thing I expected to see.
- b. Michelle Pfeiffer un-made-up, that I'd really like to see.
- c. What I'd really like to see is Michelle Pfeiffer on the boardwalk.

The examples in (114) show that these SoA-denoting constituents are not noun phrases, and do not appear as individual-denoting arguments (some of these may be acceptable, irrelevantly, if the XP following the name is read as a parenthetical).

- (114) a. \* I shook the hand of Michelle Pfeiffer signing autographs.
- b. \* Michelle Pfeiffer un-made-up walked by.
- c. \* Michelle Pfeiffer in her trailer ordered pizza.

The examples in (115) contrast with those in (113), showing that depictive predicates cannot appear in these contexts (compare (112a-c), where *met* could be substituted for *saw*).

<sup>26</sup> If locative PPs can be depictive adjuncts as well as VP adjuncts, then I suppose (112c) is three-ways ambiguous.

- (115) a. \* Michelle Pfeiffer signing autographs was the last thing I expected to meet.  
 b. \* Michelle Pfeiffer un-made-up, that I'd really like to meet.  
 c. \* What I'd really like to meet is Michelle Pfeiffer on the boardwalk.

I take it as established that *see* can occur with a small clause complement with an AP, PP, or VP predicate, subject to some restrictions which will be explored below.

### 5.1. The interpretation of the complement of *see*

We can now return to the examples in (111), or the similar ones in (116).

- (116) a. Stephanie saw Nathaniel.  
 b. Stephanie saw Nathaniel jump.  
 c. Stephanie saw that Nathaniel jumped.

Recall that I suggested that the verb in (116a) and the verb in (116b) were the same verb; *see* is a relation between two entities, one of which might be a state of affairs. Applying the rules of translation given in §3 above, (116a) translates into the formula in (117a), and (116b) translates as in (117b) (ignoring the last step mapping the root IP onto an information-unit).

- (117) a. Past-see'(s, n)  
 b. Past-see'(s, <l, jump'(n)>)

The translation in (117a) is unexceptional. But consider the translation in (117b). It states that Stephanie is in a seeing relation with a situation-type characterized by Nathaniel jumping; in other words, it is very like the translation of sentences involving emotive verbs. The situation-type is completely abstract; no entailments can be drawn from it, for example we cannot conclude from (117b) that Nathaniel actually jumped. Nor does it entail that Stephanie saw the burglar jump, even if Nathaniel is the burglar. However, the sentence in (116b) is generally held to have both of those entailments. Therefore, something is missing from (117b). It might be thought that the small clause complement of *see* should translate as an information unit, as in (118).

- (118) Past-see'(s, A(w<sub>b</sub>(s), ^jump'(n)))

However, this is definitely wrong. The intensional context introduced by the information unit means that certain inferences will go through regarding what is seen, for example *Eleanor saw Theodore telephone*

*Rachel* will entail *Eleanor saw Rachel be telephoned by Theodore*, which is wrong (this is the sort of inference that was said in Chapter 1, §3, to be appropriate for belief contexts). Furthermore, no inferences will go through regarding what is actually true. Perceptual reports characteristically introduce extensional contexts, as discussed extensively in Barwise 1981 and Barwise & Perry 1983. If [i] Bruce saw the Catwoman go through a door, and [ii] the door was an exit, and [iii] Katherine was the Catwoman, then the sentence *Bruce saw Katherine leave* is true, whether or not Bruce realized [ii] or [iii].

Higginbotham 1983 proposes that this fact can be captured by interpreting an example like (119a) as in (119b), where *e* is a variable over SoAs, based on Davidson's 1967a event variable (cf. Higginbotham's exx. (10-11)).

- (119) a. Bruce sees Katherine leave.  
 b.  $\exists e[\text{leave}'(k, e) \wedge \text{see}'(b, e)]$

The whole proposition is evaluated against the real world; if Katherine is the Catwoman in the real world, then any event of Katherine's leaving is also an event of the Catwoman's leaving. The desired inference goes through. However, note that a similar translation would be quite wrong for an emotive predicate. *Katherine wants Bruce arrested* clearly does not entail that there is some situation in which Bruce is arrested. It seems, then, that although the extensional context that is associated with a state of affairs is appropriate for the translation of a perceptual report, something is needed to distinguish the unrealized SoAs of emotive predicates from the real-world SoAs of perception verbs.

The right results are available if we assume that the SoA which is seen is necessarily cotemporaneous with the event of seeing. This can be effected by indexing the spatiotemporal location in the representation of the SoA. If at 5 PM Bruce sees Katherine leave, then necessarily, Katherine leaves at 5 PM. Using the translation of the present tense from Chapter 1, §3, this gives us the translation in (120) for the sentence in (119a), arbitrarily using '7' as a temporal index.

- (120)  $\exists t_r : t_r = t_7 [\text{see}'(b, <l_7, \text{leave}'(k)>, t_r)]$

(120) means that there is some reference-time equal to time '7' (i.e. simultaneous with that particular contextually established time, the time of the utterance of the sentence) such that Bruce saw a SoA at that time; the SoA is characterized by Katherine leaving at time 7 (allowing the subscript on the *l* feature label to stand for a partial specification of the value of *l*; the *l* feature also includes a spatial component which is not specified). Now the SoA denoted by the small clause complement is no

longer a situation-type, but a real occurring state of affairs. It follows that if the SoA of Katherine leaving exists for Bruce to see it, then she must have left, and the Catwoman must have left as well, and so on.

How do we force the coindexing in (120) to occur? Assume for the moment that it is required by the rule in (121), a lexical-item-specific rule associated with *see*.

(121) Simultaneity rule:

Coindex the temporal component of the complement of *see* with the time of seeing

If the verb *see* is assumed to contain a temporal value of some kind, then this is the time of seeing (cf. the discussion in Chapter 1, §3 of the existence in tensed verbs of some feature specification of this kind; in tensed verbs, this feature specification was crucial and led to dependency, but in non-tensed verb forms it is inessential for interpretation). In fact, given the mechanism of head-chain formation from Chapter 1, §2, we can replace (121) with (122).

(122) Veridicality rule:

- a. If *x* sees *y*, *y* exists.
- b. If *y* exists, it exists at some time.
- c. If (and only if) *y* exists at time *z*, then the temporal component of *y* (if it has one) is specified with the value *z* (e.g.  $I_z$ ).

(122) invokes what Barwise 1981 calls VERIDICALITY, namely the fact that in order for something to be seen, it has to exist. A situation-type is abstract; a state of affairs with an indexed spatiotemporal location really exists. Thus, by requiring that the spatiotemporal feature of a SoA have a value, (122) is in essence requiring of it that it exist. If values are not freely assigned but must be acquired from some rule or other, then the only way for the complement of *see* to get a *l* value is via head-chain, from above. Either *see* or the Infl above it will supply a temporal value for *l*. The various components of (122) do not have identical status. (122a) is a lexical stipulation; we can say that *see* is veridical, and therefore is subject to (122a). (122b-c) can be taken as defining what it means for an element to have a specified temporal index, in a completely general way. Individuals such as people and carrots are not generally assumed to have a temporal component at all (they are first-order entities, in the sense of Lyons 1977), so (122c) simply does not apply to such concrete entities.

Note that I have used the vague term ‘temporal component’ rather than using the *l* feature in the rule in (122c). First, the event seen may not

be in exactly the same place as the event of seeing; real events must, however, be located in space as well as time. We might assume that all spatiotemporal values must be either fully specified or not at all; thus, by forcing a value on the temporal component, we require the spatial component to be set as well. The other reason for the formulation of (122c) is that I want it to extend to IP complements of *see* as well, and it is not as clear that Infl bears the *l* feature (as discussed in §3 above), though it clearly has a ‘temporal component,’ in the tense operator.

Consider what this means for a sentence like that in (123).

- (123) a. Isabella saw Trent to behave strangely.  
 b. Alice saw Felix to crave more.

The examples in (123), where *see* takes an infinitival complement, are not completely unmarked, but they are possible (they are formal, perhaps on a par with believe-type ECM verbs; cf. §1 above). According to the discussion in §3 above, the translation of an infinitival IP can be as a proposition or as a state of affairs, depending on whether anchoring feature specifications are supplied (for a proposition) or an unrealized tense specification is supplied (for a state of affairs). Rule (122) requires that the ‘temporal component’ of the infinitival IP be specified. If it is specified as simultaneous with the event of seeing, then it cannot also be unrealized; thus, the infinitival complement of *see* can only be interpreted as a proposition. This of course requires that it have some  $\omega$  feature values. The stiffness of the examples in (123) might be taken to indicate that only in more formal registers does *see* have  $\omega$  feature specifications (I return to this matter briefly in §5.3 below).

The account, as it stands, predicts that the infinitival IPs in (123) can only be interpreted as propositions, and not as SoAs. This means that the IPs should introduce intensional contexts: inferences concerning identity, for example, should not go through. Consistent with this prediction, it seems that (124a), for example, does not entail (124b), even if Matthias is the tallest spy.

- (124) a. Sylvia saw Matthias to be a threat.  
 b. Sylvia saw the tallest spy to be a threat.

This should not be taken to indicate that the infinitival IP is interpreted as an unlocated situation-type, after the fashion of the infinitival complements to emotive verbs (where, it will be recalled, various sorts of inferences also did not go through). This can perhaps be seen most clearly by comparing examples like those in (124) to examples with emotive and epistemic verbs with infinitival complements, as in (125).

- (125) a. The dog likes me to offer it food.  
 b. The dog believed me to offer it food.  
 c. The dog saw me to offer it food.

(125a) does not refer to any particular event of food-offering; the dog likes a kind of situation.<sup>27</sup> But in (125b), the dog believes that a particular event of food-offering took place; the food-offering event is asserted to exist in a proposition which is anchored to the dog's belief-set. (125c) is much more like (125b) than it is like (125a). A particular event of food-offering is referred to, even if the dog is mistaken and none occurred.

The possibility of interpreting the complement of *see* as a proposition (or an information unit) raises an interesting question. What does it mean to 'see' a proposition? It certainly seems to be the case that proposition-denoting elements appear as the complement to *see*, as in (116c) above, or in (126) below.

- (126) a. Everyone could see that the party was over.  
 b. Quintana saw that there was no more beer.  
 c. Jorge saw that Phineas had shot Eglantine.

This use of *see* is sometimes taken to be something different (cf. Dretske 1969, Higginbotham 1983, Safir 1993). The denotation of the CP is not a state of affairs or event; in (126c), an event, the event of Phineas' shooting Eglantine, is obliquely referred to, but that is not what is observed. What is observed is, perhaps, Eglantine's dead body, or even a notice in the newspaper; the fact that a shooting event involving Phineas and Eglantine occurred is inferred from some visual evidence.

The contrast between *see* with an SC and *see* with a CP is illustrated in Barwise 1981, using the examples in (127) (his exx. (3-4)).

- (127) a. Dick saw Rosemary remove the crucial part of the Watergate tape.  
 b. Dick saw that Rosemary removed the crucial part of the Watergate tape.

As Barwise notes, (127a) means that Dick perceived some goings on; Rosemary erased the tape within Dick's field of vision; Dick's eyes were functioning, and so on. It does not mean that Dick understood what was

<sup>27</sup> It seems that in order to like something, one has to have experienced it, and (125a) cannot be used if I have never offered the dog food before. But it is nevertheless clear that the emotive attitude being described is an attitude toward a type of situation rather than a particular situation. Compare *would like*, which cancels the requirement that the thing have been experienced.

going on. He might have had no idea that Rosemary was erasing the tape; he might have simply thought she was rewinding it. In fact, he might not have realized that the person operating the tape player was named Rosemary. (127a) simply means that the event took place, and Dick witnessed it. (127b) is quite different. It requires that Dick understood that the crucial part of the tape was removed, and that Dick understood that Rosemary did it. It does not, however, require that Dick witnessed that particular event. He may have come across the tape, found that it had been erased, and realized that only Rosemary could have done it.

Continuing this line of thought, when the complement to a perception verb is a finite clause, that clause is interpreted as a proposition. What does it mean to 'see' a proposition? Of course, propositions are not really the sorts of things that can be seen. They are a form of information. It is sometimes assumed that this necessitates a second verb *see* (cf. Dretske's 1969 'epistemic seeing' and 'non-epistemic seeing'), but I follow Barwise 1981 in assuming that this is not the case. Consider the sentences in (128).

- (128) a. I could plainly see her discomfort.  
 b. We saw years lifted from his face.  
 c. They saw the problem at once.  
 d. She could see what was wrong with the car.

In these cases, the complement to *see* is not a CP (with the possible exception of (128d)),<sup>28</sup> and yet the directness of the perception is not clear. On the basis of such examples (they are easy to generate, not only for *see* but for the other perception verbs like *feel* and *hear* as well), I conclude that what is needed in examples like (126) is not so much a separate lexical item *see* which takes a CP and means, 'infer on the basis of visual perception,' but a flexibility in the interpretation of *see* which allows the inference of some information about the world on the basis of the visual perception of some piece of conclusive evidence.

This kind of flexibility is permitted by Barwise's translation of *a sees φ as 'a sees a scene s that supports the truth of φ'* (his exx. (39-40)). A scene SUPPORTS the truth of a proposition when the proposition can be verified by viewing the scene. Crucially, we want *φ* to be evaluated against *a*'s belief-world, not against the (speaker's) real world, since

<sup>28</sup> Cf. Bresnan & Grimshaw 1978 on free relatives. The fact that XPs like *what was wrong with the car* can be extraposed (*It was obvious what was wrong with the car*) and can appear with verbs that do not subcategorize for DP (*We wondered /the problem/what was wrong with the car*) show that at least sometimes, this string can be a CP; cf. Grimshaw 1979.

substitutability does not hold (Bruce might see that Katherine left without seeing that the Catwoman left). The scene  $s$  must be in  $w_R$ , in order for Bruce to see it, but nothing said so far requires  $\phi$  to be true in  $w_R$ . Now, if  $a$ 's belief-world does not contain the information that Katherine is the Catwoman, the inference does not go through. There is an additional condition on  $\phi$  that it be true in  $w_R$ , owing to the presuppositional anchoring force of the complementizer *that*, as discussed in Chapter 1, but this does not come from *see*.

Important to this account is a proper restriction of the notion 'supports'; a scene involving Katherine's car driving away only supports the truth of *Katherine left* if there is some very strong reason to believe that Katherine was in that car. I will assume that it a suitable definition of support will account for the usual intuition that for (116b) (*Stephanie saw Nathaniel jump*) to be true, then (116a) (*Stephanie saw Nathaniel*) must be true. Rizzi 1992, for example, gives the following example (his page 43, adapted from his translation of his Italian example).

- (129) Yesterday at the theater I saw Frank Sinatra give a prize to Bob Hope, but the guy seated in the next row blocked my view, so I couldn't actually see {Bob Hope/#Frank Sinatra}.

As indicated, Rizzi marks as infelicitous (with #) the version where the speaker didn't actually see the referent of the subject of the small clause (Sinatra), whereas he indicates that the version where the referent of the internal argument (Hope) remains unseen is acceptable. The contrast, though subtle, shows that the subject argument of the event is somehow more important than the other arguments. But I do not think that it conclusively shows, as Rizzi claims, that a  $\theta$ -role must be assigned by the verb to the small clause subject. Consider the examples in (130) ((130a) from Akmajian 1977:456, (130b-c) from Gee 1977:468).

- (130) a. I saw it raining yesterday.  
       b. I have never seen there be so many complaints from students before.  
       c. I would like to see it (be) proven that John was there that night.

Rizzi suggests that the small clause subjects in (130) are exempt from the condition that they be directly seen because they are non-referential; this, I think, could be better handled by an account based on the notion 'supports' than one based on  $\theta$ -assignment ((130a) will be discussed further in §3). Consider also the examples in (131) ((131e) from Akmajian 1977:456, citing Gee's 1975 Stanford University dissertation).

- (131) a. They saw the distant enemy artillery lob shells toward them.  
       b. We could smell the farmers spreading manure on the fields.  
       c. I heard some trees being cut down.  
       d. I heard the farmer slaughter a pig.  
       e. I felt John hitting me with a rock.

I believe that all of the examples in (131) could be regarded as true without the direct perception of the small clause subject (this is uncontroversial, I think, for the examples in (131b-c)). I am also of the opinion that *Stephanie saw Nathaniel leave* could be taken as true if Stephanie saw Nathaniel's car pull away, or if she saw a crowd leave and had strong reasons to believe he was in that crowd. In such a context, someone might challenge the truth of the sentence, but if it later turned out that Nathaniel was in fact in that car or that crowd, then the utterer of the sentence would have been right and the challenger wrong. I will assume, then, that a properly formulated felicity condition takes care of Rizzi's example.

## 5.2. Simultaneity

An apparently irreducible fact about perception verbs like *see*, *hear*, and *feel* is that the state of affairs denoted by their SC complement is necessarily understood as holding at the time of the event of perception; compare the SC complement to a causative verb, which has a degree of temporal independence.

- (132) a. John saw the house collapse.  
       b. Becky heard the rafters crack.  
       c. The earthquake made the house collapse (several days later).  
       c. John had the children jump out of the box (when Becky came home).

At first this fact about perception verbs seems trivial. If (132a) is true, then John saw an event, the event of the house's collapsing. But recall from the last subsection that there is a certain flexibility in interpretation; John might see a scene which 'supports' the existence of the collapse of the house; for example, say that the house is standing, and then John blinks, and when he opens his eyes, the house has collapsed. Now, this sequence of events certainly seems to warrant an inference by John that the house has collapsed; yet it is not sufficient to make (132a) true. John's perception really has to be simultaneous with the event in such cases.

This is captured in the account developed here by the requirement that the complement of a veridical verb like *see* exist, and the lack of any

other source for its temporal index than the main clause itself. Of course, causative *make* also requires that its complement exist, but we can capture the distinction by saying that *make* provides a temporal index for its complement which is not necessarily identical with that of the clause containing the verb *make* itself.

### 5.3. Stativity

Now consider the contrast between (133a) and (133b), discussed in Akmajian 1977, Gee 1977, and elsewhere.

- (133) a. \* I saw Jean know French.  
 b. I saw that Jean knew French.

Intuitively, (133a) is unacceptable because the fact that someone knows French is not an event that happens in any perceptible way; but (133b) is perfectly acceptable, in a context where some visual clue allows the confident inference of that fact that Jean knows French. What accounts for the contrast between (133a) and (133b), if the same verb *see* is used in both cases? Milsark 1974 claimed that the secondary predicate following *see* must be stage-level (Carlson's 1977 term for what Milsark called 'event-descriptive'), but this fails to account for the fact that (133b) is acceptable.<sup>29</sup> For Higginbotham 1983, the complement of *see* must have a Davidsonian event variable, which stative verbs do not have, following Davidson (but cf. Higginbotham 1985, where it is claimed that all predicates have *e*).

On the account developed here, the SC complement of *see* must have some spatiotemporal location *l*, because otherwise it cannot denote a SoA. This is conceptually plausible on the grounds that anything that is located has *l* and something has to be located in order to be seen. A small clause headed by a stage-level predicate has *l*, following the discussion in §3 above (building on Kratzer 1989 and Diesing 1992); a small clause

<sup>29</sup> Note that small clauses with individual-level adjectives, like *intelligent* in [iib], are also ill-formed (though stage-level predicates like *drunk* are acceptable, showing that this is not a matter of stativity), while infinitival IPs, such as that in [ib], are acceptable.

- [i] a. We saw that they were {drunk/intelligent}.  
 b. We saw them to be {drunk/intelligent}.
- [ii] a. We saw them be {obnoxious/\*intelligent}.  
 b. We saw them {drunk/\*intelligent}.

This is consistent with the position taken here that CP and IP complements to perception verbs (as in [i]) are systematically different from AP and VP small clauses (as in [ii]) in the same environment.

headed by an individual-level predicate does not; it is inherently unlocated. On the other hand, (133) is acceptable because it does not denote a small clause at all; it denotes a proposition, and the question of being located does not come up. The complementizer supplies ω features for the anchoring of the proposition, requiring that it be presupposed true, following the discussion in Chapter 1, §3.

However, I suggested above that the complement of *see* is anchored to the subject's belief-set, on the grounds that the validity of various inferences is subject to what it is the subject of *see* knows; for example, *Guenevere saw that the Black Knight won* entails *Guenevere saw that Sir Lancelot won* only if Guenevere knows that Lancelot is the Black Knight. This seems to suggest that *see* has a ω feature specification. But if *see* has ω feature values, then why can't it supply them to a proposition-denoting small clause? This should especially be possible in those dialects or registers in which proposition-denoting infinitival complements are possible, as in (123) above. At this point I will only suggest two possible answers. One is that the veridicality requirement of *see* (particularly (122a-b)) rules out proposition-denoting small clauses in the sense that they are not located in the real world in any way. This means that proposition-denoting IPs are located in the relevant sense, because of the tense operator, which grounds them to a particular time. The other possibility is that *see* never has ω features, and it is the felicity condition suggested by Barwise that results in the understanding that the complement of *see* is also interpreted as being something that the subject comes to believe. On this view, the 'real' anchoring for the propositional complement in examples like those in (126) above is only that supplied by the complementizer. If this anchoring is absent, as it would be if *see* had a Control PredP complement, as in (133a), then there is no possible interpretation for the complement, and the structure is ruled out.

## 6. Conclusion

In this chapter I have argued for a basic distinction between states of affairs and propositions, both of which are represented syntactically by nexususes. The analysis presupposes a distinction between predication and argument saturation which was adopted in Chapter 1. There, it was argued that predication is mediated by a functional head, of which there are at least two species: Infl is a predicator with a tense operator, and Pred is a predicator without a tense operator. Assuming the VP-Internal Subject Hypothesis, a verb assigns theta-roles within its maximal projection. This process can be called argument saturation. The theta-roles assigned by the verb must be discharged. The VP, with all of the arguments of the verb inside it, can be called a saturated function-argument complex, or a constituent sequence; it corresponds to the nominalized function of Chierchia 1985. Predication is another matter. When a property is predicated of a subject, a nexus is formed. A nexus is distinct from a function-argument complex; but a function-argument complex may be a property, and can be predicated of some subject. In some cases, the function argument complex is predicated of an argument from within the function-argument complex itself. In other cases, the predicate-argument complex is predicated of something else. This led to the adoption of two distinct forms of Infl and Pred, to wit Raising and Control Infl (from Diesing 1992) and Raising and Control Pred.

This means that there are four different formal representations for nexususes, and (at least) two things that can be denoted by nexususes, namely states of affairs and proposition. I have argued that the nexal complement to the *believe* and *consider* classes of verbs must denote a proposition, and to this end must be anchored to some set of possible worlds. This anchoring is mediated by the feature  $\omega$ , which epistemic verbs bear a value for. I have argued that Infl also bears the feature  $\omega$ , which means that IP can in general be modally anchored and can denote a proposition. I have argued that Control Pred also bears the feature  $\omega$ , but that Raising Pred does not, and that a small clause headed by Raising Pred cannot denote a proposition. This accounts for the necessarily strong readings for the subjects of small clause complements to consider-type verbs.

The nexal complement to verbs like *want* and *like*, on the other hand, denotes a state of affairs (in approximately the sense of Barwise & Perry 1983). States of affairs are not anchored in the way that propositions are, but they have a spatiotemporal location, which I represented using the feature  $l$ . The complement of an emotive verb is typically a situation-type, a kind of state of affairs which has an unspecified  $l$  feature, which means it is not located with respect to the

real world. I argued that in order for a nexus to denote a state of affairs, it must have something like a location parameter; the tense operator in an infinitival Infl can function as a location parameter, and Raising Pred has an appropriate location parameter, possibly acquired from its complement, which must be a stage-level predicate (in the sense of Carlson 1977). Control Pred, on the other hand, is unable to provide a spatiotemporal location, and therefore cannot denote a state of affairs. This explains why the small clause complement to an emotive verb cannot have an individual-level predicate.

Finally, I suggested that perception verbs, in particular *see*, could appear with a state-of-affairs denoting small clause complement, but that the spatiotemporal parameter in that state of affairs must be specified, owing to the veridicality of *see*. When *see* appears with an infinitival complement, the interpretation of that complement is necessarily propositional, because the specification of the tense operator in Infl to match the temporal value of the clause containing the verb *see* results in a form of anchoring, and an anchored nexus is interpreted as a proposition.

I have argued that the system of head-chain formation developed in Chapter 1 accounts for certain observed properties of the dependent nexus structures involving the various kinds of verbs, and that two types of predication must be distinguished in small clauses as well as in clauses. To the extent that the analysis is successful, it provides additional support for the various mechanisms developed in Chapter 1, particularly the notion of nexus (from §1), since the nexus turns out to be the basic building-block for both the proposition and the state of affairs. In addition, the conception of head-chains developed in Chapter 1 (in §2) is supported by their importance in the analysis here, as is the formal model of dependency (from §3).



## Verb-Particle Constructions\*

### 0. Introduction

In this chapter I discuss VERB-PARTICLE constructions, which are typified by the pattern in (1a-b) below. To save space, such alternations in word order will sometimes be represented as in (1c), with the braces indicating alternative placements (different from parentheses, which indicate optional placement).

- (1) a. Francine turned the television on.
- b. Francine turned on the television.
- c. Francine turned {on} the television {on}.

A PARTICLE is an intransitive preposition (following Emonds 1972; but see below). In the analysis to be detailed in this chapter, the DP *the television* in (1) is not a direct object of the verb; I will refer to it pretheoretically as the POSTVERBAL DP. I will refer to the alternation in word order (between V-DP-Prt as in (1a) and V-Prt-DP as in (1b)) as PARTICLE SHIFT (this term is not so pretheoretical, as it anticipates my analysis of the alternation as involving leftward movement of the particle).

There are 'compositional' verb-particle constructions, as in (2a), where the meaning of the construction is more or less transparently related to the meanings of the individual words, as well as idiomatic ones, as in (2b) (some works, e.g. Fraser 1976 and Aarts 1989, have treated the two types separately, but I do not think there is sufficient ground for a syntactic distinction; see Bolinger 1971 and Declerck 1978 for discussion).

- (2) a. Richard chased {out} the dog {out}.
- b. Phoebe brought {up} the kids {up}.

Verbs that take prepositional phrase complements, as in (3a), are not verb-particle constructions; particle shift is not possible, as indicated in (3b).

- (3) a. The dog doted on its master.
- b. \* The dog doted its master on.

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\* The roots of this chapter go back to my first qualifying paper, written in 1990. Some of the material has been presented as UCSC and UC Irvine; I thank my audiences there for their helpful comments.

I will argue in this chapter that the differences between (1) and (3) stem from the fact that in (1), the DP is the 'subject' of a nexus (the predicate of which is the particle) (as in Bolinger 1971 and Kayne 1984). In (3), on the other hand, the DP is the complement of the preposition, and there is no embedded nexus, simply a prepositional phrase complement to the verb. In other words, the structure of (1a) is roughly as in (4a) (omitting details), and the structure of (3a) is essentially (4b).

- (4) a. Francine [vpturned [scthe television on]]
- b. The dog [vpdoted [ppon its master]]

I will argue that particle shift is movement of the particle from its base-generated position to a functional head position (the 'Raising Pred' of Chapter 2) in the small clause.

To facilitate discussion, I will further define some terms here. I will refer to structures in which a PP follows a verb, including not only examples like (3a) but also examples where the PP is an adjunct (e.g. *The dog barked in the tunnel*), as PREPOSITIONAL constructions, to distinguish them from verb-particle constructions.

As another point of terminology, I would like to use the term PARTICLE not simply to refer to intransitive members of the category P, but more generally to those elements that enter into the verb-particle construction; of course, this presupposes a certain analysis. I will refer to *on* in (5) as a particle, even though it is transitive in (5b) and (as a result, I will argue) does not undergo particle shift.

- (5) a. Edward put {on} a wig {on}.
- b. Edward put {\*on} a wig {on} Dorothy.

I will not use the term particle to refer to elements such as *upstairs* in (6a), *over* with the meaning 'again' in (6b), or *on* in (6c-d); none of these constructions can undergo particle shift.

- (6) a. Francine put the piano upstairs.
- b. Franz wrote the document over.
- c. Freida decided on Beijing.
- d. Felix wants his sweater on.

However, according to my analysis, *on* and *into* in the examples in (7) must be particles. The reason for this will become clear in the discussion below (ultimately, all the elements that I refer to as particles will be prepositions used predicatively and c-selected (or l-selected) by a verb; the term has no theoretical significance but is a convenient label for this class of elements).

- (7) a. The light turned on.  
b. Dracula turned into a bat.

The chapter is organized as follows: in §1, I present the basic data to be accounted for. In §2, I summarize some previous accounts. In §3, I develop the analysis, and show how it accounts not only for the data presented in §1, but also for a range of other facts that have not (to my knowledge) been discussed in the literature.

## 1. Data to be accounted for

In this section I briefly present the main features of the verb-particle construction that have been discussed in the literature. Each thorough account of the construction has attempted to deal with these problems, or most of them.

### 1.1. The classic problems

The hallmark, as it were, of the verb-particle construction is that the postverbal DP and the particle freely alternate in order, except under certain conditions. First, if the DP is an unstressed pronoun, it must precede the particle, as shown in (8).

- (8) a. Francine put it on.  
b. \* Francine put on it.

This restriction holds for the basic personal pronouns *me, you, us, him, her, them*, and *it*, when they are unstressed. It does not hold for stressed pronouns, as in (9a), nor coordinated pronouns, as in (9b), nor for the possessive pronouns such as *mine* and *hers*, as indicated in (9c); nor does it hold for demonstrative pronouns such as *that* and *those*, as in (9d), nor for the indefinite pronoun *one*, as in (9e).<sup>1</sup>

- (9) a. I'll give it up, and I'll give up YOU.  
b. Al threw out him and her.  
c. He would cut off mine, if he got the chance.  
d. Al threw out these.  
e. Al threw out one.

The restriction that unstressed personal pronouns must precede the particle can be referred to as the PRONOUN PROBLEM. The pronoun problem will be discussed in detail in §3.

Particle shift is also restricted when the particle is modified: only an unmodified particle may appear before the postverbal DP, as shown in (10).

<sup>1</sup> Jespersen 1949:105-6 (MEG VII), cites several examples, including (9a) and also [ia] from Dickens, and [ib] from Shaw, repeated here, in the interests of science.

[i] a. If you want to ease your mind by blowing up somebody, come into the court and blow up ME.  
b. What! Cut off your brother's head? Why not? He would cut off mine, if he got the chance.

- (10) a. Nina coiled {up} the whip {up}.  
 b. Nina coiled {\*all the way up} the whip {all the way up}.  
 c. Dan took {off} the bandages {off}.  
 d. Dan took {\*completely off} the bandages {completely off}.

The pattern in (10) may be referred to as the MODIFIER PROBLEM.

Another restriction on the placement of the particle has to do with its complements. When a particle has a prepositional phrase complement, as in (11), it may undergo particle shift (unless the PP is headed by *of*, as in (11d)). But when it has a DP complement, as in (12), it may not.

- (11) a. Roll {up} the ball {up} over the ridge.  
 b. Throw {out} the dog {out} into the yard.  
 c. Slide {down} the rope {down} into the hole.  
 d. Break {\*off} the branch {off} of the tree.

- (12) a. Roll {\*up} the ball {up} the ridge.  
 b. Throw {\*out} the dog {out} the door.  
 c. Slide {\*down} the rope {down} the hole.  
 d. Break {\*off} the branch {off} the tree.

The pattern in (12) might be referred to generally as the DP COMPLEMENT PROBLEM.

Another very well known trait of the verb-particle construction is its distinctive stress pattern. The contrast between pairs like (13a-b) and (13c-d) is pointed out in many introductory English grammars. In the examples, I have marked main word stress impressionistically, based on a plausible pronunciation; the marks are not meant as a theoretical statement, only to indicate the distinction between the verb-particle construction ((13b) and (13d)) and prepositional constructions ((13a) and (13c)).

- (13) a. The 'passenger' flew in the 'plane.  
 b. The 'pilot' flew 'in' the 'plane.  
 c. 'Maggie' looked up the 'tree (to see if her cat was there).  
 d. 'Maggie' looked 'up' the 'tree (in her *Field Guide to North American Trees*)

In (13a) and (13c), the preposition is unstressed. It forms a prosodic phrase with the noun phrase it takes as a complement. In (13b) and (13d), on the other hand, the particle is likely to be stressed; it forms a prosodic unit with the verb, and the main stress for that prosodic unit tends to fall squarely on the particle (sometimes the stress falls on the verb, leaving

the particle unstressed; but I assume that even in such cases, the verb and the particle form an intonational unit). Syntactic structure is relevant to prosodic phrasing (see e.g. Selkirk 1984), so we want our syntactic account to be able to accommodate the pattern in (13). Call this the INTONATION PROBLEM.

One more classic problem which has driven previous analyses has to do with constituency tests. The P<sup>0</sup>-DP sequence in prepositional constructions (which as was noted above never undergo particle shift) passes constituency tests, as in (14a), indicating that it comprises a syntactic constituent (namely, a PP). The Prt-DP sequence and the DP-Prt sequence of the verb-particle construction, on the other hand, fail to behave as a constituent, as shown in (14b-c).

- (14) a. It was on the potato crop that their lives depended.  
 b. \* It was on her sweater that she put.  
 c. \* It was her sweater on that she put.

This phenomenon can be referred to as the CONSTITUENCY PROBLEM.

## 1.2. More problems

The facts just presented are often explicitly recognized in works on the verb-particle construction (cf. §2 below) as issues to be dealt with. There are some other facts that are more often taken for granted, but which I think can profitably be treated as problems. For example, consider the optional variation in word-order typified in (1). In such works as Chomsky 1957 and Emonds 1976, this was a prototypical optional transformation. However, in general, options of word order turn out to have some effect on interpretation, either with respect to truth-conditional information, as when scrambling forces 'strong' readings for DPs (see, e.g. de Hoop 1992), or with respect to information packaging, as when a fronted element is interpreted as a topic (see, e.g. Vallduví 1990). For example, (15a) is a possible dialogue, but the same response in (15b) is bizarre.

- (15) a. A: How does Martha feel about fish?  
 B: Fish, she likes.  
 b. A: What do you think Martha would like for dinner?  
 # B: Fish, she likes.

Thus these movements are not truly optional: their use or non-use has an effect on interpretation, even if in some cases it is only pragmatic. A recent view (Chomsky 1993) holds that there are no optional movements; the principle Procrastinate states that no movements are made before they

are forced. A topic might be 'forced' to move because it is marked as a topic; but there should be no truly free movements with no interpretational effect. Yet particle shift seems to be just that: in the usual case, the two orders have no discernible distinction in truth conditions or felicity conditions (cf. Diesing & Jelinek 1993, for whom this is also a problem, though for different reasons). Both versions of both dialogues in (16) are equally good (the responses in (16a) are best with stress on *out*, while the responses in (16b) are best with stress on *dog*).

- (16) a. A: What did Louise do with the dog?  
 i. B: She threw the dog out.  
 ii. B: She threw out the dog.
- b. A: What did Louise throw out?  
 i. B: She threw the dog out.  
 ii. B: She threw out the dog.

I will refer to this as the OPTIONALITY PROBLEM.

Another fact that is well known but not usually regarded as a problem is the fact that only certain constructions participate in particle shift. For example, the prepositions in prepositional constructions never undergo shift, as noted above; cf. (17a) below.<sup>2</sup> Nor do particles which appear as the predicates in the types of small clauses discussed in Chapter 2; cf. (17b). Furthermore, words other than the core locational prepositions such as *on*, *off*, *up*, *down*, *in*, and *out* generally do not undergo particle shift, as suggested by (17c).

- (17) a. Sam climbed {up} the tree {\*up}.
- b. Jorge considered {\*out} the runner {out}.
- c. Bernadette pushed {\*sideways} the latch {sideways}.

As the data in (17) actually reflect disparate phenomena, I will refrain from applying a label here; but the problem of determining what does and does not undergo particle shift is one to which I will return.

### 1.3. Some new problems

There are, in addition, some peculiarities of the verb-particle construction that have not received widespread attention.

One of these is the fact that the Mainland Scandinavian languages exhibit a three-way contrast (cf. Taraldsen 1983); in Danish, the particle must follow the postverbal DP, as shown in (18a); Norwegian is like English in that both orders are acceptable, as in (18b); and in Swedish, the particle must precede the postverbal DP, as in (18c).

- (18) a. Vi slap {\*ud} hunden {ud} (Dan)
- b. Vi slapp {ut} hunden {ut} (Nor)
- c. Vi släpte {ut} hunden {\*ut} (Swe)  
 we let out the.dog out  
 'We let the dog out'

The contrast is interesting, since the grammars of the three languages are otherwise so similar; an analysis must be sufficiently constrained so as to not falsely predict nonexistent differences in the languages. Let the pattern in (18) be known as the SCANDINAVIAN PROBLEM.

Another usually overlooked problem is exemplified in (19). The DP-Prt sequence can be coordinated, as in (19a-b), but the Prt-DP sequence cannot, as shown in (19c-d) (noted previously in Svenonius 1992b).

- (19) a. Try to hold your hands up and your elbows down.
- b. The storm windows keep the heat in and the cold out.
- c. \* Try to hold up your hands and down your elbows.
- d. \* The storm windows keep in the heat and out the cold.

This can be dubbed the COORDINATION PROBLEM.

Different patterns of data are problems for different analyses. Problems other than those listed in this section will be discussed as they come up. In the next section, I discuss some of the previous literature.

<sup>2</sup> It would be wrong to think that prepositional constructions are distinguished from verb-particle constructions solely or even chiefly by their inability to undergo particle shift; apart from the differences in stress (cf. (13) above) and constituency (cf. (14)), there are important semantic differences, as verb-particle constructions are essentially resultative (cf. Bolinger 1971); this will be discussed in detail below.

## 2. Previous accounts of the verb-particle construction

The verb-particle construction has been much-studied; it is sometimes hailed as the embodiment of the genius of the English language; for example, Roberts (1936:480) calls it "one of the most effective instruments of thought ever evolved", and Smith (1925:255) suggests that "[i]t would almost seem as if these particles and verbs of action took the place in our northern speech of the gestures in which our intercourse is lacking, but which are so vivid an accompaniment to the speech of the Latin peoples, whose languages are poor in the emphatic use of particles." Here I will not undertake a review of the great body of work on the topic; I will briefly summarize only a few of the more recent discussions, focusing on those which bear directly on the proposal at hand. See Declerck 1978 for a list of pre-generativist works on the construction.

This section is organized in a way that makes sense (I think) for exposition; it is not strictly chronological. First, three early proposals for different base structures are discussed (Chomsky 1955, Emonds 1976, and Bolinger 1971), then more recent works are discussed, including those of Kayne, myself, Taraldsen, and den Dikken. Other works are mentioned in passing as they relate to these works.

### 2.1. Chomsky 1955: A complex [v<sup>0</sup>V<sup>0</sup>-P<sup>0</sup>]

Over the years there have been various proposals for the structure of the verb-particle construction; Chomsky 1955 (cf. also Chomsky 1957) proposed a complex [v<sup>0</sup>V<sup>0</sup>-P<sup>0</sup>] at deep structure, which took a DP direct object (the analyses of Fraser 1976 and Johnson 1991 are similar in relevant respects).<sup>3</sup> Particle shift was effected by a transformation. Various objections to this analysis can be raised on the grounds that the V<sup>0</sup>P<sup>0</sup> sequence is not a single word; and it is not clear whether the base-generation of complex zero-level categories which are not words should be permitted; on one view, each zero-level category is a word (e.g. Selkirk 1984). The verb+particle combination, though it is a prosodic unit, is not a word phonologically (each part of it bears word stress) or morphologically (inflection appears on the verb only). Note, too, that the

verb+particle never moves as a syntactic unit, which we would expect it to do if it were a complex verb. This can be seen in the Norwegian V2 construction in (20) (cf. the similar examples in Åfarli 1985, who makes the same point).<sup>4</sup>

- (20) a. Olaf kastet ut hunden. (Nor)  
*Olaf threw out the.dog*  
 'Olaf threw out the dog'
- b. I går kastet Olaf ut hunden.  
*Yesterday threw Olaf out the.dog*  
 'Yesterday Olaf threw out the dog'
- c. \* I går kastet ut Olaf hunden.  
*Yesterday threw out Olaf the.dog*

In (20a), the V+Prt order is shown for a Norwegian sentence. When the verb precedes the subject, as in (20b), the particle stays in place; it cannot be moved along, as indicated in (20c). Thus, although it is true that the verb and the particle are tightly knit, they do not form a complex word for purposes of head movement.<sup>5</sup>

Another serious problem for the [v<sup>0</sup>V<sup>0</sup>-P<sup>0</sup>] analysis is that the particle can project a whole phrase, if it is separate from the verb. If a movement transformation derives (21b) from (21a), then it is unclear how (21c) is to be generated.

- (21) a. Those hoodlums snapped off the antenna.
- b. Those hoodlums snapped the antenna off.
- c. Those hoodlums snapped the antenna right off my car.

<sup>4</sup> Some varieties of English, for example Northern Irish English, allow verb-fronting past an overt subject in imperatives, as in [i] (pointed out and supplied to me by Jim McCloskey).

- [i] a. Open you that door!
- b. Do you your homework!

If a verb-particle combination appears in this construction, the particle must be stranded, as in [ii]. [iic] in particular shows that the particle must be stranded even if it has shifted.

- [ii] a. Shut you up!
- b. Take you them clothes out to the kitchen!
- c. Take you out them clothes to the kitchen!

<sup>5</sup> Of course, the possibility cannot be ruled out that this is EXCORPORATION, i.e. head movement of a subconstituent of a complex head as in Roberts 1991 and Koopman 1993a, b. Such movement may be necessary in order to accommodate the German separable-prefix constructions referred to in fn. 3 above.

<sup>3</sup> As is the analysis of Dutch separable prefix verbs in Neeleman & Weerman 1993. The objections I raise here to Chomsky 1955 (and Johnson 1991) do not apply to Dutch, where the separable prefix does attach morphologically to the verb stem, does not project a phrasal projection, and does not undergo XP movement. Thus I follow Neeleman & Weerman for Dutch (and German).

Presumably the full PP *right off my car* could not be generated below V<sup>0</sup>. For further discussion of the [vV<sup>0</sup>-P<sup>0</sup>] analysis, see Kayne 1984 and Svenonius 1992b.

### 2.2. Emonds 1972: A ternary structure

Another analysis of verb-particle constructions which is sometimes assumed (for example, Emonds 1972, 1976, Huang 1977, Åfarli 1985) is a triple-branching structure, where the DP and Prt are both generated as sisters to V<sup>0</sup>, under V'. A simple 'local' transformational rule or even an LP statement (as in Falk 1983 or Gazdar et al. 1985) can provide for particle shift. The fact that the particle can appear with complements and modifiers is not a problem, since (in most triple-branching analyses) the particle projects a full PP. I am aware of no compelling arguments against triple branching structures in principle, but here there are reasons not to adopt one.

First, compare the sentences in (22). In the sentences on the right, the postverbal DP is the direct object of the verb. It is the thing taken, brought, made, or kept; its thematic interpretation is determined wholly by the verb, in a sense usually formalized by assuming that the verb assigns it its θ-role. But in the sentences on the left, the interpretation of the postverbal DP is completely different.

- (22) a. Dick took his socks off ≠ Dick took his socks  
 b. Phoebe brought the kids up ≠ Phoebe brought the kids  
 c. Bart made the castle up ≠ Bart made the castle  
 d. Garlic keeps the mosquitos away ≠ Garlic keeps the mosquitos

The interpretation of the postverbal DP in the sentences on the left in (22) depends on the particle, or more exactly, on the combination of the verb and the particle. Compare other cases where a verb (arguably) takes two complements, as in (23).

- (23) a. Dick loaded the wagon with hay. |= Dick loaded the wagon.  
 b. Phoebe loaded boxes into the truck. |= Phoebe loaded boxes.  
 c. Bart sent the packages to Holland. |= Bart sent the packages.  
 d. Richard talked to Matt about taxes. |= Richard talked to Matt.  
 e. Matt persuaded Richard to stay. |= Matt persuaded Richard.

The sentences on the left in (23) entail the sentences on the right; the second complement does not change the relation between the verb and

## VERB-PARTICLE CONSTRUCTIONS

the DP that follows it.<sup>6</sup> An account in which the DP and the particle are both complements to V, the special idiosyncratic interpretation of the whole requires some additional explanation.

Of course, there is a large number of verb-particle combinations that are transparently related to simple transitive uses of the same verbs, so that the postverbal DP in the verb-particle construction does seem to get the same interpretation as the direct object of the verb. Some examples are given in (24).

- (24) a. The cook cut the carrots (up).  
 b. The courier sent the package (off).  
 c. The carpenter glued the tiles (down).

I will assume that productive cases like these are allowed by a regular lexical rule which allows resultative structures, as in Hoekstra 1988; the affected object of a transitive verb is replaced in the subcategorization frame with a state of affairs small clause, and the subject of that small clause is generally (though not necessarily) interpreted as if it were the affected object. See Kayne 1985, Hoekstra 1988; see also Fernald 1992 for problems with this account; see §5.2 below for some specific cases of productivity. Treating the compositional verb-particle constructions in (24) as having the same structure as the idiosyncratic ones in (22) has the advantage of allowing them to have the same syntactic properties (e.g. the ones noted in §1 above). Otherwise, the account of particle shift proposed here would have to be supplemented with another rule which mimicked its effects, in constructions like those in (24).

As noted in §1, the usual constituency tests such as clefting and topicalization fail to pick out the DP-Prt sequence as a constituent (the constituency problem), contrary to the predictions of the small clause analysis. This might be taken as indirect evidence for the triple-branching analysis, but I believe instead that the impossibility of displacement of

<sup>6</sup> In some cases a particle (as in [i]) or a second complement (as in [ii]) is obligatory, and the V+DP is not grammatical without it.

[i]	a. The explosion caved the roof in ≠ *The explosion caved the roof
	b. Matt looked the information up ≠ *Matt looked the information
	c. Richard put the music down ≠ *Richard put the music
[ii]	a. Alex gave Vanna an envelope ≠ *Alex gave Vanna
	b. George put the fish in the bucket ≠ *George put the fish.
	c. Vanna hit the stick against the fence ≠ Vanna hit the stick (*on instrumental reading)

I think that cases like those in [i] are examples of exactly the same phenomenon observed in (21) above; cases like those in [ii] have been analyzed as involving small clauses, e.g. in Kayne 1984 and Hellan 1988.

the small clause is due to aspects of interpretation, a situation similar to that affecting the propositional small clauses examined in Chapter 2. The small clause is dependent on the verb and cannot be moved away from it.

One constituency test that does not separate the small clause from the verb (and hence does not interfere with interpretation) is coordination; the observations made above regarding coordination provide evidence for the small clause analysis. The DP and particle can be treated as a constituent in a coordinate structure (as pointed out in §1).

- (25) a. Pauline turned [the acetylene on] and [the oxygen off].
- b. The storm windows keep [the cold out] and [the heat in].
- c. Try to hold [your hands up] and [your elbows down].
- d. Bill switched [the TV on] and [the light off].

Of course, coordination is notoriously unreliable as a constituency test, but the pattern in (25) is expected on the small clause analysis and not easy to account for otherwise (see Svenonius 1992b for arguments that the examples in (25) are not produced by Gapping). In stark contrast, the particle and following DP cannot be treated as a constituent in this fashion, as shown in (26).

- (26) a. \* Pauline turned [on the acetylene] and [off the oxygen].
- b. \* The storm windows keep [out the cold] and [in the heat].
- c. \* Try to hold [up your hands] and [down your elbows].
- d. \* Bill switched [on the TV] and [off the light].

The triple-branching analysis is hard-pressed to account for the contrast between (25) and (26), whereas the small clause analysis automatically predicts the pattern in (25), and the analysis of the V-Prt-DP order as derived by leftward movement of the particle will be shown (in §3.5 below) to provide an account for the pattern in (26).

### 2.3. Bolinger 1971: A nexus

Bolinger (1971) noted the predicational relation between the postverbal DP and the particle, comparing examples like those in (27) (from Bolinger 1971:91) (cf. also Aarts 1989, 1992).

- (27) a. He let the reins go.
- b. He let the reins out.

Bolinger suggested that the DP-Prt sequence constituted a clausal constituent (S), complement to the verb. This is essentially the position I take here, modulo the exact category of the constituent (here it is not identical to a main clause, though it is clausal). In fact, most recent

accounts have assumed that the DP and the particle form a constituent in the base-generated structure (e.g. the accounts of Taraldsen 1983, Kayne 1985, and den Dikken 1992, all discussed below).

It should also be noted that Bolinger stressed the 'resultative' nature of the verb-particle construction (see esp. his Ch. 8), which I take to be a defining characteristic. This will be taken up in detail in §5 below.

### 2.4. Kayne 1985: Rightward movement of DP

Kayne 1984 (in the introduction, page x) and 1985 proposes a Stowell-style small clause structure for the verb-particle construction; that is, he proposes that the postverbal DP is base-generated in SpecPP, and remains there at S-structure in the V-DP-Prt order. He provides a number of arguments for this position, most of which carry over to the analysis of particle constructions as small clauses with a functional head. For example, Kayne notes that there are no verb-particle constructions where a CP or PP occupies the position I have been referring to as the 'postverbal DP.' Some of Kayne's examples are given in (28) (from Kayne 1985:104).

- (28) a. John teamed {up} with Bill {\*up}.
- b. They stocked {up} on foodstuffs {\*up}.
- c. They've done {away} with free wine {\*away}.
- d. She pointed {out} that he was wrong {\*out}.

Kayne suggests that this sort of pattern is expected if the postverbal DP is base-generated as a subject, subjects generally being realized as DPs (cf. Ross' 1967 INTERNAL S CONDITION, and the discussion in Koster 1978). Kayne notes that PPs may sometimes be subjects, as in (29a), and suggests that in similar circumstances, they can be the subjects of particle small clauses, as in (29b) (from Kayne's p. 107; I retain his judgments).

- (29) a. Is under the bed a good hiding place?
- b. ? I bet they pick under the bed out as their new hiding place.

Kayne argues that the V-Prt-DP order is derived by rightward movement of the DP across its predicate, a special instance of Heavy NP Shift (HNPS). The same proposal was made by Huang in his 1977 LSA paper,<sup>7</sup> though he assumed an Emonds-style triple-branching structure. The HNPS analysis accounts for the pronoun problem, since pronouns are not

<sup>7</sup> Huang's 1977 paper was published as Huang 1985. There, he mentions that the same analysis came up in LSA talks by C. Hoffman in 1978 and R. Smaby & P. Baldi in 1979, but I do not know whether those papers ever appeared in print.

'heavy' in the relevant sense. However, I argued in Svenonius 1992b that this analysis of particle shift was incorrect. First, notice that HNPS only affects informationally and prosodically 'heavy' DPs, as shown in (30b-c), where *over* is a VP adverbial; but non-heavy DPs regularly appear to the right of particles, without any difference in interpretation, as in (30d), where *over* is a particle.

- (30) a. We had to plan the party over.  
       b. \* We had to plan over the party.  
       c. We had to plan over the surprise party for Janet.  
       d. We had to think over the party.

Another problem with the HNPS analysis of particle shift is that HNPS moves a DP to the right periphery of the VP, as in (31a), but particle shift only reorders the DP and particle, as in (31b); (31c) shows a non-heavy DP at the right periphery of VP, incorrectly predicted grammatical by Kayne's analysis.

- (31) a. Jason lined up on the wall a bottle each of a hundred and twenty different kinds of beer.  
       b. Jason lined up the bottles on the wall.  
       c. \* Jason lined up on the wall the bottles.

For other arguments against the rightward DP movement analysis, see Svenonius 1992b.

## 2.5. Svenonius 1992b: Prt movement to V

In Svenonius 1992b I adopted Kayne's base structure (with the Stowell-style PP small clause, with no functional head), and argued that the V-Prt-DP order was derived by the attachment of the particle to  $V^0$  by head movement in the fashion of Baker 1988, as sketched in (32).<sup>8</sup>

- (32) a. Jason lined [the bottles [up on the wall]]  
       b. Jason [lined up<sub>i</sub>] [the bottles [ t<sub>i</sub> on the wall]]

Such an analysis has the advantage of accounting for the close relation between the verb and the particle (e.g. nothing other than the DP comes between them, and also the fact that they combine prosodically, cf. the intonation problem of §1) and the fact that when the particle precedes the DP, it is always a bare head, never having modifiers or complements (cf.

<sup>8</sup> Unbeknownst to me at the time, Holmberg 1986:201-2 had already tentatively suggested the same thing.

the modifier problem of §1, and the DP complement problem). However, there are problems for that analysis. As noted by Åfarli (he was interested in defeating a "lexical" analysis of particle shift) (cf. also §2.1 above), the verb and particle do not really form a word; stress and morphology suggest that *lined up* in (32) is two words, not one. Furthermore, verb movement, such as V movement to C in V2 structures, affects only the verbal subpart of the purported V-Prt constituent, a form of exorporation which is often assumed not to exist (cf. §2.1 above, especially the Norwegian examples in (20); however, Koopman 1993a argues for exactly this sort of exorporation). Finally, a  $V^0\text{-}P^0$  complex verb violates Williams' 1981b Right Hand Head Rule, in that the leftmost part, rather than the rightmost part, would seem to be the head of the word (Holmberg 1986:203 suggests that the stress and inflectional anomalies of the  $V^0\text{-}P^0$  verb follow from its being left-headed, exceptionally, and gives some examples from Swedish of possible exorporation).

The Scandinavian languages provide one more possible piece of evidence against the analysis of the V-Prt-DP order as the result of head movement of Prt to V. Danish has real incorporated verb-particle structures, which are quite distinct from the verb-particle sequence in the V-Prt-DP constructions.<sup>9</sup> The alternations in (33a-d) are adapted from Herslund 1984:44-45 and 1993:54-55).

- (33) a. Han gav sine studier op. (Dan)  
       b. Han opgav sine studier.  
       *he up.gave his studies up*  
       'He gave up his studies'  
       c. Han peger noget ud.  
       d. Han udpeger noget.  
       *he out.points something out*  
       'He points something out'  
       e. Han fylder skemaet ud.  
       f. Han udfylder skemaet.  
       *he out.filled the.form out*  
       'He filled out the form'

Herslund stresses that the alternation shown in (33) is quite lexically restricted, more so than the verb-particle alternation in English or Norwegian. In many cases, a V-DP-Prt construction does not have a

<sup>9</sup> Norwegian and Swedish have overtly incorporated forms only in the passive; e.g. *Skatten ble bortgjemt* 'the treasure was away.hidden' is the passive of *gjemme skatten bort* 'hide the treasure away.' I will return to this below.

corresponding prefixed alternative (and, of course, there are lexicalized prefixed verbs which do not have a V-DP-Prt alternative, like English *overthrow*).<sup>10</sup> However, the great number of such alternations in Danish in contrast to Norwegian, Swedish, and English suggests that it be treated as a (semi-)productive process. One option is to consider it a lexical rule that derives V-Prt compounds from the lexical entries for verb-particle combinations; the other is to treat it as syntactic head movement. If the latter approach is taken, then the alternation in (33) militates against an incorporation analysis for the more loosely confederated V-Prt sequence in English, Norwegian, and Swedish. Otherwise, we would have to distinguish two different forms of incorporation, contra Baker (1988), who argues that if one head moves to another, they are morphologically and phonologically incorporated (see also den Dikken 1992 for the same argument, including observations about overt V-P incorporation in Dutch). The Danish incorporation structure is considered further in §3.6.

### 2.6. Taraldsen 1983, 1991b: Leftward movement of DP

Based on data from the Mainland Scandinavian languages, Taraldsen 1983, 1991b proposes an analysis in which the two possible word orders have slightly different structures. In the V-Prt-DP order, the DP is the complement of a P, which heads a PP complement to V, as in (34a). In the V-DP-Prt order, the DP is also base-generated as the complement of P, but moves into a small clause subject position, as in (34b) (the examples are from Taraldsen 1983:240).

- (34) a. Vi slapp [PP ut hunden]. (Nor)  
      b. Vi slapp [Sc hunden; [PP ut t<sub>i</sub>]].  
           *we let      the.dog    out the.dog*

Taraldsen notes parallels between the verb-particle construction and the Scandinavian construction which he calls the LA-CAUSATIVE, for the causative verb *la* 'let, make.' The la-causative, as Taraldsen notes, is very similar to the Romance causative construction that Kayne (1975) dubbed the *faire par* construction (see also Burzio 1986); it is illustrated in (35) (from Taraldsen 1983:203).

<sup>10</sup> Sometimes, a lexicalized form shares a meaning as a verb-particle combination, as is the case with English *turn over* and *overturn* (*The mob turned (over) my car (over)/The mob overturned my car*). This is quite rare in English, less so in Norwegian (which, it should be noted, has extensive historical contact with Danish). Its rarity recommends treating it as a lexical accident, and not deriving one form from the other by syntactic movement in those languages.

- (35) a. Vi lot løslate fangene.  
           *we let release the.prisoners*  
           'We had the prisoners released'  
      b. Vi lot fangene løslate  
           *we let the.prisoners release*  
           'We had the prisoners released'

(Nor)

Unlike the secondary predicate in the English translations, the Norwegian verb *løslate* in (35) is not passive in form; nor is it an unaccusative verb (\**Fangene løslot*); it is an obligatorily transitive verb, just like *release* — yet its external argument is suppressed in (35), and only its internal argument is realized.<sup>11</sup> Thus we can assume, in accordance with general principles of the realization of arguments, that the DP *fangene* 'the prisoners' in (35) is base-generated as the complement to the verb *løslate* 'release', suggesting that (35a) is basic.

Taraldsen notes that the pattern observed with respect to particle shift, where Danish allows only the V-DP-Prt order and Swedish allows only V-Prt-DP, is repeated in the la-causatives: Danish allows only (35b), and Swedish has only (35a); the examples are diagrammed in (36) (with the DP in braces rather than the predicate; this is intended to suggest Taraldsen's analysis, in which it is the DP that moves).

- (36) a. Vi lod {fangene} løslade {\*fangene}. (Dan)  
           *we let the.prisoners release the.prisoners*  
           'We had the prisoners released'  
      b. Vi lät {\*fångarna} släppa {fångarna}. (Swe)  
           *we let the.prisoners release the.prisoners*  
           'We had the prisoners released'

Taraldsen supports his analysis by showing that the DP which follows the secondary predicate in (34a) and in (35a) behaves like an object for the purposes of binding, while the DP which precedes the predicate in (34b) and (35b) behaves like a subject, suggesting that it has moved into a

<sup>11</sup> There is a great deal of literature on the Romance *faire par* construction. See Moore 1991, Chapter 5, for discussion and references. As Guasti 1990 notes, most Germanic languages have something corresponding to *faire par* as well; English seems to have a relic of this construction in *let go*; the OED has *He let make a proclamation* from 1440, but all later examples with verbs other than *go* have an overt subject. Roberts 1993 gives several examples from the fourteenth and fifteenth centuries; see Roberts (esp. pp. 286 ff.) for discussion and references. Jespersen (1940, §4.5.35 (MEG V)) gives some examples with *make* with adjectival predicates: *he woundeth, and his hands make whole* (Bunyan); *Morelet could be so happy in making happy* (Carlyle).

specifier position. Taraldsen's examples are given in (37) (from Taraldsen 1983:217, 242 and 1991b:227).<sup>12</sup>

- (37) a. \* Vi lot arrestere banditten uten å få snakke med sin  
*we let arrest the.bandit without to get speak with his-REFX*  
*advokat.*  
*lawyer*  
 'We had the bandit arrested without (him) getting to speak with his lawyer'  
 b. Vi lot ham arrestere uten å få snakke med sin  
*we let him arrest without to get speak with his-REFX*  
*advokat.*  
*lawyer*  
 'We had him arrested without (him) getting to speak with his lawyer'  
 c. \* Vi lot arrestere spionen like før sin avreise.  
*we let arrest the.spy just before his-REFX departure*  
 'We had the spy arrested just before his departure'  
 d. Vi lot spionen arrestere like før sin avreise.  
*we let the.spy arrest just before his-REFX departure*  
 'We had the spy arrested just before his departure'  
 e. \* Vi jaget ut ulven for å gjenfinne sin tapte frihet.  
*we chased out the.wolf for to re.find its-REFX lost freedom*  
 'We chased out the wolf to find its lost freedom again'  
 f. Vi jaget ulven ut for å gjenfinne sin tapte frihet.  
*we chased the.wolf out for to re.find its-REFX lost freedom*  
 'We chased the wolf out to find its lost freedom again'

The reflexive possessive pronoun *sin* is subject-oriented. It can be bound by *spionen* 'the spy' in (37d), but not in (37c). In (37e), the DP *ulven* 'the wolf' is unable to bind the PRO subject of the purpose clause, but it can do so in (37f). Taraldsen argues that these are indications that the pre-predicate DP in each case has moved from complement position up into a subject position.

Taraldsen's analysis is complex, and I will not be able to do it justice here (his analysis is also intended to account for cross-linguistic variation with respect to auxiliary selection and extends to Romance languages). Taraldsen proposes a parameter (1991b:240): languages have SUBJECT-DRIVEN LINKING or OBJECT-DRIVEN LINKING. Simplifying

greatly, a verb (or particle) in a subject-driven linking language can only have a subject if it also has an object; a verb (or particle) in an object-driven linking language can only have an object if it has a subject. Now, consider the structures in (34) again, repeated in (38) with English in place of Norwegian.

- (38) a. We threw [PP out the dog].  
 b. We threw [SC the dog<sub>i</sub> [PP out t<sub>i</sub>]].

Now, recall that in Swedish, only (38a) is possible. Taraldsen argues that this is because Swedish has object-driven linking: in order for the particle to have an object, it must have a subject. In (38a), the particle is considered to have a subject because it is coindexed with the verb: the verb and the particle undergo P(redicate)-COMPOSITION (his pg. 237; cf. also Gawron 1986a), and projections of V are defined as projections of P; some projection of VP has a subject, so P has a subject; thus, it can have an object, and the DP in PP in (38a) is licensed. (38b), on the other hand is out: the preposition still has an object (though it has moved), but the SC node prevents P-composition, and P has no subject.

Danish, on the other allows (38b) but not (38a). Taraldsen proposes that Danish is a subject-driven linking language: in order for a predicative head to have a subject, it must have an object. In (38b), the particle has no subject, so the condition does not apply to it. The verb, on the other hand, has a subject; it must therefore have an object. The DP in SpecSC, to which the verb assigns Case, counts as a 'canonical object' under Taraldsen's definition (his page 240), so the subject of V is licensed. (38a), however, is bad; the verb has a subject, but has no object (either Danish does not have p-composition, or else the object of the preposition does not count as a 'canonical object' of P even if V and P are composed). Taraldsen suggests that Norwegian allows both subject-driven and object-driven linking, and can generate either of the structures in (38).

Taraldsen's analysis is appealing in a number of respects. The movement of a DP complement to a subject position is definitely called for in some cases, such as that in (39) (from Taraldsen 1983:203).

- (39) a. De lot sette krone på mannen. (Nor)  
 b. De lot mannen sette krone på.  
*they let the.man set crown on the.man*  
 'They had the man crowned,' i.e. they made him king

However, (39) is a frozen form; it does not represent a productive pattern. In most cases, the base-generation of the postverbal DP as a complement to P<sup>0</sup> is inconsistent with some facts about the argument structure of

<sup>12</sup> Åfarli 1985:26 disputes the data, with respect to the verb-particle constructions.

prepositions, which I will explore in detail in §4 below. There, I argue that while *the glass* may indeed be base-generated as the complement to *out* in (40a) (cf. (34)), *the milk* in (40b) must be base-generated in SpecPP; and since particle shift is possible there, too, Taraldsen's analysis is not adequately general.

- (40) a. Wilbur rinsed {out} the glass {out}.  
       b. Wilbur rinsed {out} the milk {out}.

The fact that Taraldsen's analysis does not capture the predicative nature of the particle is underscored by the fact that he must postulate a semantically vacuous SC; the main function of the SC node in Taraldsen's analysis is to block p-composition. It has no effect on interpretation at all, since the two structures in (38) are completely synonymous.

Some of the technical details of Taraldsen's analysis are also questionable. The definitions of 'canonical object' and 'canonical subject,' on which the analysis is crucially based, are not independently motivated; for instance, note that although the pre-predicate DP in the examples in (37) counts as a subject for purposes of binding *sin*, it must not for purposes of linking, or Swedish would allow the V-DP-Prt order. Furthermore, p-composition allows a verb and a particle to share a subject in an object-driven linking language, thereby licensing an object, but the same mechanism does not allow the same heads to share an object in a subject-driven linking language.

It is especially vital for Taraldsen's analysis that the conditions on, and formal properties of, p-composition be determined, since it must distinguish verb-particle constructions from prepositional constructions; i.e., the examples in (41), for Taraldsen, are distinguished only in that *on* p-composes with *tie* in (41a), but not with *rely* in (41b); both involve a PP complement to V.

- (41) a. Johann Olav tied on his skates.  
       b. Johann Olav relied on his skates.

Without any structural distinction between (41a) and (41b), we must have a clear notion of what p-composition is, since it is the only thing accounting for the differences between these two sentences in terms of the intonation problem, the constituency problem, the modifier problem, or the pronoun problem, as illustrated in (42).

- (42) a. \* It was on his skates that Johann Olav tied.  
       b. It was on his skates that Johann Olav relied.  
       c. \* Johann Olav tied right on his skates.  
       d. Johann Olav relied completely on his skates.  
       e. \* Johann Olav tied on them.  
       f. Johann Olav relied on them.

There are some obvious similarities between the notion of p-composition and the notion of head-chain formation. In the account developed in §3 below, I will make use of head-chains, and also postulate a layer of (semantically significant) functional structure for (41a) (and for its alternative *Johann Olav tied his skates on*), but not for (41b).

### 2.7. Den Dikken 1992: Reanalysis as LF head movement

Den Dikken 1992 provides an extensive discussion of verb-particle constructions. He is primarily concerned with complex constructions, like *They made John out (to be) a liar* (cf. also Kayne 1985, den Dikken 1990) and *They sent the schedules out to the shareholders*. I will not discuss complex constructions here; but some of den Dikken's arguments and observations are relevant here, and I outline them in some detail because I build on them in §3 below.

Den Dikken notes the possibility of a functional head in the particle construction, but opts not to make use of it; his analysis of particle shift involves leftward DP movement from complement to specifier, just like that of Taraldsen's just discussed, except that for den Dikken, the two orders involve the same structure (a PP small clause complement to V<sup>0</sup>). This is diagrammed in (43).

- (43) a. We threw [PP [P out the dog]].  
       b. We threw [PP the dog] [P out t<sub>i</sub> ].

According to den Dikken, the postverbal DP receives Case in (43b) from the verb, but in (43a) it cannot receive Case from the particle, the particle being by definition an intransitive preposition. In order to get Case to the postverbal DP, the particle must REANALYZE with the verb (his page 55). For den Dikken, reanalysis of the verb and the particle is defined as head movement of P to V at LF — this makes it identical to Stowell's 1991a restructuring, already discussed in Chapter 2; in order to avoid confusion with the different senses of reanalysis already introduced, I will call den Dikken's reanalysis restructuring.<sup>13</sup> The complex head formed by

<sup>13</sup> Cf. also Baker's 1988 analysis of Romance causatives, where "cosuperscripting" (continued next page)

restructuring is a Case assigner, since its subconstituent V is a Case-assigner, and it governs the DP complement of P by the GTC (the Government Transparency Corollary of Baker 1988, which entails that a complex head governs everything governed by a trace of one of its subconstituents), since the trace of its subconstituent P governs that DP. Thus the post-particle DP receives Case from the complex V-P constituent. If restructuring does not occur, the particle is not a Case assigner (cf. §4.3 below), and the DP must move to the Spec position in order to receive Case.

Den Dikken does not explain why particles should not be able to assign Case of their own in the verb-particle construction, given that they are perfectly capable of doing so in other contexts (e.g. in PPs such as *up the creek*, *on the counter*, etc.). In fact, constructions such as *kick the dog out the door* are particularly problematic for him, as *the dog* is supposed to originate as the complement to *out*, and there is no obvious place to put *the door*; den Dikken suggests (p. 94) that *the door* is an adjunct in such cases. I provide evidence against this in §4. Den Dikken's account falls prey to some of the same objections that I levied against Taraldsen's, particularly since the postverbal DP is not in general interpreted as if it were the complement of P; instead, the DP is the subject of P, which requires that the DP be generated in its Spec (note that den Dikken assumes Baker's 1988 UTAH (Uniformity of Theta-Assignment Hypothesis), cf. his p. 19); and the predication of that DP by P, following Bowers 1993, can only obtain with the assistance of a functional head.

Den Dikken's analysis also relies on certain problematic assumptions about Case assignment. If accusative Case assignment by V occurred at S-structure (i.e. before Spell-Out), then restructuring would have to occur overtly, as in the proposal in Svenonius 1992b, in order for the DP to receive Case in complement position, or the DP would have to raise to Spec position; den Dikken argues convincingly (pp. 87-90) that P does not move overtly to V (cf. the discussion in §2.5 above), but only at LF. This suggests that Case is an LF phenomenon, as in Chomsky 1993. But if Case is an LF phenomenon, then why does DP movement ever occur overtly? It seems that den Dikken can either motivate DP movement before Spell-Out, assuming that Case is checked early, or restructuring at LF, assuming that Case is checked late, but cannot account for optionality: if Case can be checked 'anywhere' (as in Johnson 1991), then principles of Economy (e.g. Procrastination) would require that it be checked as late in the derivation as possible.

(cf. Rouveret & Vergnaud 1980) of the causative verb and the embedded verb is allowed just when head movement occurs at LF.

Den Dikken addresses this matter briefly, in footnote 25 on page 56. He notes the possibility that Case is an LF phenomenon but does not explain why DP movement would then ever be motivated. Assuming that Case is checked at S-structure, on the other hand, he follows Baker 1988 in supposing that the verb and the particle which undergo reanalysis at LF are co-superscripted at S-structure, which in this case, he assumes, confers Case-assigning properties on P at S-structure. This is essentially equivalent to allowing a HEAD-CHAIN to be formed between V and P, and assigning Case to the complement of P by CHAIN GOVERNMENT (government by a member of a head-chain that includes the Case-assigner; cf. Chapter 1, §2.2 here, or Sigurðsson 1990). But if a head-chain can be formed, then it is again unclear why the DP should ever move, since principles of Economy should prevent unnecessary movement. Den Dikken, noting this, suggests (in footnote 26, p. 57, citing unpublished work by Eric Hoekstra) that English speakers might be "bilingual," using two different grammars to generate the two different options. This would require a sentence like *John threw out the garbage and took the laundry in* to be analyzed as code-switching; if this is possible, then the theory is seriously compromised. Consider the lack of predictive power if any speaker could entertain two grammars at once, each with a different setting for a particular parameter, and switch freely between them, even in mid-sentence.

Den Dikken's account for the obligatory movement of pronouns (i.e. the fact that they must precede the particle and can't follow it) is that pronouns cannot receive Case by chain-government. He provides support for this from other examples of non-local Case assignment, namely Locative Inversion and Dative Shift constructions, where pronouns are prohibited. However, he does not explain why pronouns should not be able to receive Case by chain-government. I return to this point in §3.4.

In §3 below, I adopt an account that is similar to den Dikken's in several respects; specifically, I assume that 'reanalysis' of V with P makes P a Case assigner (i.e. a Case-chain is formed between V and P) and allows it to assign Case to the postverbal DP, which is therefore not required to move to a higher specifier position. However, my analysis diverges from den Dikken's on a number of important points. For example, I assume that a layer of functional structure, motivated by the predication relation between the postverbal DP and the particle, crucially figures in to reanalysis, and that reanalysis is possible only after overt movement of P<sup>0</sup> to that functional head position.

### 2.8. Summary of previous works

The previous accounts discussed in this section fall into three general classes in terms of the base structure they posit: the complex V<sup>0</sup>-P<sup>0</sup>, as in Chomsky 1955, the triple-branching structure, as in Emonds 1976, and the small clause structure, as in Bolinger 1971. I place myself in the last camp; but within this camp there is a further division: Kayne, Taraldsen, and den Dikken all account for the word-order alternation by moving the DP (Kayne to the right, Taraldsen and den Dikken to the left), whereas I proposed in Svenonius 1992b that the word-order alternation should be treated as a matter of particle movement (to V<sup>0</sup>); this was intended to capture some of the insights of the complex V<sup>0</sup>-P<sup>0</sup> analysis, since a V<sup>0</sup>-P<sup>0</sup> complex appeared at some level of representation (S-structure, rather than D-structure as in Chomsky 1955 and Johnson 1991). However, problems for that analysis were pointed out, especially by den Dikken 1992.

In the account to be detailed below, two threads are combined: movement of the particle to a higher head position is still the basis for the V-Prt-DP order, as in Svenonius 1992b (though the higher head position is not V<sup>0</sup> but the functional head of the small clause), but DP movement is implicated in the V-DP-Prt order, as in Taraldsen 1983 and den Dikken 1992. The new analysis, I think, escapes the criticisms leveled at the old one, and in addition accounts for a much wider range of data than has hitherto been considered.

### 3. The analysis

In this section, I detail my own analysis of the verb-particle construction, illuminated by the work summarized in the preceding sections. As suggested briefly in the introduction to this chapter, I analyze the verb-particle construction as involving a small clause including the postverbal DP as its subject and the particle as the head of its predicate. Recall from Chapter 2 that the SC complement of want-type verbs, interpreted as a state of affairs, was independent in the sense that it could be interpreted independently of the selecting verb, while the SC complement to consider-type verbs, a proposition-denoting small clause, was dependent on features supplied by a higher node for its interpretation. Particle small clauses are like the complements to want-type verbs in that they denote states of affairs, rather than propositions, but they are like the complements to consider-type verbs in being dependent for their interpretation — although for a different sort of feature. The particle small clause and the verb enter into a very close relationship, which allows idiomatic interpretation (e.g. the meaning of *bring up* is only very abstractly related to the usual meanings of *bring* and *up*) and prevents displacement, just as in the dependency observed with propositional small clauses (e.g. clefting is impossible: \**It was a little monster up that we brought*).

In my analysis, which builds directly on those discussed in §2 above, the basic surface structure of a sentence containing a verb-particle combination is shown in (44), where the small clause is indicated as PredP, and its head as Pred<sup>0</sup> (based on Bowers' 1993 'Pr'; cf. Chapter 1, §1).

(44) [IPThe doctor [VP looked [PredP the file; Pred<sup>0</sup> [PP t; up]]]]

In (44), the subject of the small clause has been base-generated in SpecPP and moved to SpecPredP, where it receives Case from V. So far, the verb-particle construction is like any other construction where a small clause is complement to V. There is, however, one crucial difference: whereas verbs like *want* and *consider* simply take a state of affairs or a proposition, we cannot just say that the verb *look* s-selects or c-selects a state of affairs; if we said the same of *throw* in *Throw off your chains!*, we would falsely predict the grammaticality and interpretability of \**Look off your chains!*

Instead, *look* must be specified in the lexicon as having a special meaning when it combines with *up*. Now, recall the discussion of c-selection in Chapter 1, §2. The traditional conception of c-selection is that it is STRICTLY LOCAL, i.e. defined under sisterhood; Baltin 1989

argues that c-selection is better thought of as a head-head relation, a relation defined as LOCAL in Chapter 1, §2. Noting that many head-complement relations could be defined over head-chains, I suggested that c-selection could also be defined over head-chains; but since extended head-chains (i.e. those with more than one link) allow non-local relations, this would allow non-local c-selection, which is generally assumed not to exist (though I noted in Chapter 1 and argued in Svenonius 1993b that it does exist in some cases). There are, at this point, two options. One, we could assume that there is a special relation of c-selection that is local (we might use Pesetsky's term l-selection for this, as it would correspond closely to his use of that term). Or two, we could assume that conditions on head-chains rule out the non-existent cases of long-distance c-selection. In the interest of keeping to a minimum the number of mechanisms used in this work, I will attempt an account along the latter lines; but if it were stipulated that there IS l-selection, and that it is local, and then the rest of my account would go through as desired. I will quickly explain how, and then turn to constructing the account in which there is no l-selection, and c-selection is a function of head-chains.

Assume that there is l-selection, and that this means that a head (perhaps only a lexical head) has a subcat value which it checks against its sister (or the head of its sister) at LF. This is how *depend* ensures that its sister is headed by *on*. Now, if *look* l-selects *up*, then *up* must be the head of the sister of *look* at LF. In the structure I am assuming, in which the sister of *look* is PredP, the only way the l-selectional requirements of *look* can be satisfied is for *up* to move to Pred (either at LF or before then). This is all that is needed of l-selection for the account I develop here.

Now, what if there is no l-selection? Then *look* controls the head of its complement via a head-chain. Head-chains, it will be recalled, allow feature values to be shared among heads in the right configuration. What I will need, as it turns out, is to motivate the movement (at or before LF) of *up* to Pred. Observationally, what this means is that the kind of chain that requires *up* cannot cross Pred. Suppose, now, that this chain specifies the identity of *up*; it specifies a set of feature values that no other lexical item could satisfy. Given the assumptions about head-chains made in Chapter 1, each head in the chain must be unspecified for the feature being determined through the chain. Now, all we need to assume is that Pred has some categorial value; its category, after all, is Pred and not P. Therefore, this restrictive chain cannot cross Pred, and the only way to satisfy the requirements of *look* is for *up* to move into Pred.

I will argue below that particle shift is the result of pre-Spell-Out movement of the particle to Pred<sup>0</sup> (but not all the way to V<sup>0</sup>, contra

Svenonius 1992b); in addition I argue that this movement enables the postverbal DP to remain in SpecPP. Thus, the particle-shifted V-Prt-DP order of the sentence diagrammed in (44) above is as in (45) below, where *up* occupies Pred<sup>0</sup>.

- (45) [IPThe doctor [vplooked [PredP up<sub>i</sub> [ppthe file t<sub>i</sub> ]]]]

This analysis turns out to allow a straightforward account of various properties of the verb-particle construction.

### 3.1. The particle heads a small clause

As noted above, I take the complement of the verb in this construction to be a small clause consisting of the noun phrase and the particle, as in Bolinger 1971 and various later works. The primary argument for this, as Bolinger noted, is the fact that the particle is predicated of the postverbal DP. This is obvious in cases like those in (46); less obvious cases will be taken up in §5.

- (46) a. We scraped the melted cheese off (the toast).  
 b. They chased the kangaroos in (the house).  
 c. I pushed the cow out (of the house).  
 d. They sent rockets up.

According to the constructional view of predication outlined in Chapter 1, the predication relation between the postverbal DP and the particle entails that there is a PredP complement to the verb. Since the DP can in general receive a weak reading, we can conclude that the identity of Pred is 'Raising Pred.' This entails that the DP originates in the maximal projection of the particle; in at least some cases, the particle takes an optional complement, indicating that the postverbal DP must originate in SpecPP; this is shown in (47).

- (47) We scraped [PredP [PP the melted cheese [P off the toast]]]

The structure in (47) is, of course, the D-structure of the small clause structure already familiar. The various arguments raised in Chapter 1 to motivate the analysis of small clauses in general as involving a functional head apply as well to the particle small clause.

First, note that Williams' 1983 arguments for the maximal projection status of the small clause predicate hold in particle small clauses; the particle can take all the modifiers it takes in predicate position, as shown in (48).

- (48) a. The dog went {right/partway/completely/the hell} out.  
       b. I shoved the dog {right/partway/completely/the hell} out.

In addition, the particle can be extracted, as in (49).

- (49) a. How high up did she turn the volume?  
       b. They said they would throw the dog out, and out they threw him.

The acceptability of extraction of the particle is affected by various factors, for example the fact that the only way to question a predicate is typically with a degree phrase (*how high up*, *how far out*, etc.), and many particles are not gradable (\**How high up did you look the information?*); or the fact that topicalization is usually restricted to discourse topics, and particles do not usually have the right semantic content to act as discourse topics; but when such difficulties are overcome, as in (49), extraction is possible. This indicates that the particle in such examples is contained within a phrasal projection that excludes the postverbal DP, which must then be in some position external to the phrase, namely the Spec of a functional head, following the discussion in Chapter 1.

### 3.2. The nature of the particle small clause

I speculated in Chapter 2 that the nature of the heads of the proposition-and state of affairs-denoting small clauses were responsible for certain aspects of their interpretation (as in Raposo & Uriagereka 1993); the legitimacy of those particular categories was then strengthened by the fact that propositions and states of affairs are plausible members of a semantic ontology. What, then, is the particle small clause? I argue in §5 that it denotes a state of affairs; states of affairs are the kinds of things that one can have emotions about, as with the want-type verbs, and they are also the kinds of things that can be perceived, as with the perception verbs; and in addition to this, states of affairs can be brought about, as with the causative verbs (cf. Davidson 1967b, 1969). The resultative construction (e.g. *paint the house red*; cf. Hoekstra 1988, Carrier & Randall 1991, Fernald 1992) is a productive sort of causative construction, in which an Actor brings about a state of affairs. As noted by Dowty 1979, the verb-particle construction shares many features with the resultative construction (which Dowty called ‘factive’); I suggest that all causative constructions, including those with causative verbs like *make* and *have*, resultative constructions, and verb-particle constructions, involve a state of affairs SC complement to V. What is special about the verb-particle construction is that the verb c-selects a specific head for the predicate of the SC (cf. Pesetsky’s 1992 L-SELECTION, selection for a

particular lexical item). This requires the particle to move up to a higher head position, which, I will argue, accounts for the special properties of the construction.

### 3.3. Particle-shift: $P^0$ moves to Pred $^0$

The hallmark of the verb-particle construction is the alternation in word order. As noted in §1, particles do not in general alternate in order with the subjects of small clauses that they head; this is a special characteristic of the verb-particle construction. I propose here that particle shift is movement of the particle to the functional head position of the small clause. This in turn makes it possible for the small clause subject (the postverbal DP) to remain in SpecPP, rather than moving up to the Spec of the functional head (cf. den Dikken’s analysis summarized in §2.7).

Consider the small clause constructions in (50) (the first three were motivated in Chapter 2) (I label the small clauses SC rather than PredP, just for perspicuity since the complement of Pred will often be PP in the discussion that follows).

- (50) a. The Baltic republics consider [sc Zhirinovsky [AP dangerous]]  
       b. Yeltsin regards [sc Zhirinovsky as [DP a threat]]  
       c. The US wants [sc Zhirinovsky; [PP t; out of the race]]  
       d. Bulgaria threw [sc Zhirinovsky; [PP t; out]]

In (50a-b), the subject of the small clause is base-generated in SpecPredP, as discussed in Chapters 1-2; in (50c-d), the subject is base-generated in the maximal projection of the lexical head of the predicate, and moves into Spec of the functional projection. The usual assumption is that this is motivated by considerations of Case assignment: the DP needs Case, and needs to get close enough to the verb that the verb governs it and can assign it Case; this must happen at S-structure, assuming that structural Case is assigned at S-structure (e.g. Chomsky 1981). Let us proceed with this set of assumptions; an alternative will be brought up shortly.

Recall from §2.5 above that I argued (in Svenonius 1992b) that when the particle precedes the postverbal noun phrase, it has moved across it and attached to V $^0$ . The present proposal is a modification of that proposal: the particle does move across the noun phrase, but not to V $^0$ ; instead, it moves to the functional head position in the small clause. Just when it does this, the subject of the small clause stays in SpecPP. Thus the structure of (51a) is as in (51b).

- (51) a. Bulgaria threw out Zhirinovsky.  
       b. Bulgaria threw [sc out; [PP Zhirinovsky t; ]]

This analysis retains several of the advantages of the one outlined in §2.5; for example, the movement is subsumed under a widely accepted and relatively well-understood form of movement, namely head movement; the badness of (52a-b) is due to the fact that a moved head cannot drag modifiers or complements along with it; and the badness of (52c) is due to the fact that the VP-adjunct *over* is never in a position to undergo head movement (cf. §1).

- (52) a. \* Bulgaria threw right out Zhirinovsky.  
       b. \* The president of Bulgaria threw out of the country  
             Zhirinovsky.  
       c. \* Wallace sang over his song.

In addition, this analysis avoids some problems with the earlier analysis, particularly those raised by den Dikken (1992): the particle does not morphologically incorporate into the verb (cf. the Danish examples in §2.5 above), and is stranded by verb movement, as in the Norwegian example in (53a) (repeated from (20) above).

- (53) a. I går kastet Olaf ut hunden. (Nor)  
       yesterday threw Olaf out the.dog  
       'Yesterday Olaf threw out the dog'  
       b. \* I går kastet ut Olaf hunden.  
       yesterday threw out Olaf the.dog

However, we just saw in (50d) that the small clause subject moves to SpecSC, which would put it to the left of the head position that I am now postulating is the landing site for particle-movement. For some reason, movement of the subject is unnecessary just when particle movement has occurred, as indicated in (51b) above (I am assuming that if a movement is unnecessary, it does not occur, following general considerations of Economy).<sup>14</sup>

Assuming that DP movement to SpecSC is motivated by Case theory, the obvious conclusion is that, when overt particle movement applies, the particle in the SC head position acquires the ability to assign or transmit Case to SpecPP, via a head-chain. In other words, there are two ways for the postverbal DP in the D-structure in (54a) to receive Case; it can move to SpecSC, and receive Case from V<sup>0</sup>, as in (54b), or

<sup>14</sup> For this reason I do not make the stronger claim, that when P has moved, DP movement of the postverbal DP is impossible. In fact, it is difficult to tell whether it is impossible, since if both movements occurred, the surface order would be V-DP-Prt, just as if only the DP had moved (or nothing had moved at all).

the particle can move to the SC head position, and assign Case to the DP in SpecPP, as in (54c).<sup>15</sup>

- (54) a. chop [sc [PP the vegetables up]]  
       b. chop [sc the vegetables; [PP t; up]]  
       c. chop [sc up; [PP the vegetables t; ]]

There are reasons to believe that the D-structure in (54a) is not a valid S-structure; if it were, we might expect to find PP modifiers between the verb and the DP, as in (55a), and we might expect to see the DP-particle sequence undergo A-bar movement, as in (55b) (cf. (49), where the PP minus the subject was moved; cf. also §4.3 below).

- (55) a. \* Roseanne chopped {completely/right/the hell} the vegetables up.  
       b. \* They said they would turn the volume up, and the volume up they did turn.

The question immediately raised is, why can't a Case-chain be formed in general from V to Pred, without movement of a head into Pred? This would obviate DP movement into SpecPredP in the general case. Recall from Chapter 1, §2, that a head-chain can only specify values for unspecified features. Assuming that P is in general a potential Case-assigner, a Case-chain from V to P is possible, as P bears the feature 'Case-assignment'; the value for that feature is set to "+" or "Acc" when a head-chain is formed between V and P, if V is specified, say, [Case-assignment:+]. If Pred is not a potential Case-assigner, a chain of this sort could not cross it. It is impossible, then, for the verb to form a Case-chain with Pred, or with P-in-situ.

On this analysis, the postverbal DP receives the Case of the verb in both the V-DP-Prt and the V-Prt-DP orders, unlike the situation in Taraldsen's analysis (cf. §2.6) where P assigns Case to the verb in the V-Prt-DP order. (56) shows that this is correct. The Case on the postverbal DP is determined by V, or by the V-Prt combination, never by P. In (56a), the verb *henta* is a dative Case-assigner, and the postverbal DP is dative; in (56b), the verb *leggja* assigns accusative Case; the particle *ut*

<sup>15</sup> Movement of the particle in this case would violate Chomsky's 1993 principle of Greed; however, problems for this principle have already been pointed out, for example in Lasnik 1993 (though perhaps his principle of Enlightened Self-Interest would also be violated by particle movement in (54c), since an alternative derivation is available).

does not affect this, whether it precedes or follows the DP (in fact, *út* in Icelandic is not even a Case-assigner; cf. English *away*).

- (56) a. Við hentum {út} nokkrum hundum {út}. (Ice)  
*we threw out some.D dogs.D out*  
 'We threw out some dogs'
- b. Við lögðuð {út} nokkra bækur {út}.  
*we laid out some.A books.A out*  
 'We translated some books'

Notice, too, that English particles which govern *of* when they appear with complements cannot do so when they undergo particle shift.

- (57) a. We chased the cat out (of the house).  
 b. We chased out the cat.  
 c. \* We chased out of the cat.

What is happening in (57a) is that *the cat* receives Case directly from the verb *chase*; there is no Case chain. *Out*, used in this sense, does not assign Case but allows a DP complement marked with *of*. In (57c), *of* cannot appear, because the DP *the cat* is not the complement of *out*; *out* transmits the Case of the verb to *the cat*.

#### 3.4. Applying the account to the data

The account may seem unnecessarily complex, since each of the two possible surface structures requires some element to have moved, and in one case, the movement is string-vacuous. However, this extra complexity turns out to allow a natural account for many of the problematic facts noted in §1. In the following subsections, I discuss those facts in turn, as well as a few new ones.

##### 3.4.1. The optionality problem

For example, consider the optionality problem: given a principle like Chomsky's 1993 Procrastinate, which requires that movements not be made before they have to be, how is the optionality of particle shift accounted for? Under the current analysis, the answer is that in order for the postverbal DP to receive Case, some movement must occur prior to Spell-Out. Either the DP must move, so that it can receive Case from  $V^0$ , or the particle must move, so that it can assign Case to the DP. Neither of these moves counts as "shorter" than the other, so no principles of Economy are violated (cf. Chomsky's 1993 SHORTEST MOVE condition, which prevents a derivation from converging if a parallel derivation

involves a shorter move). Which option the speaker exercises determines which surface order results. Any account in which one of the two orders is basic, the other derived, will have a harder time accounting for the optionality problem (recall den Dikken's suggestion, mentioned in §2.7, that speakers of English are "bilingual", having one grammar that produces the V-DP-Prt order and another for the V-Prt-DP order).

This may be a slight oversimplification. If the particle is I-selected by  $V$  (i.e. its categorial features are checked via a head-chain), then it must move to  $\text{Pred}^0$  at LF. Let us take a possible derivation, and call it derivation A. In derivation A, the particle moves to  $\text{Pred}^0$  at S-structure, and assigns Case to the DP; there is one movement chain at LF. In derivation B, on the other hand, DP moves to  $\text{Spec}\text{PredP}$  at S-structure, and P moves to  $\text{Pred}^0$  at LF; then at LF there are two chains, the DP chain and the head-chain. Derivation B might then be ruled out by the Shortest move condition, since derivation A has fewer chains. However, consider the situation if the postverbal DP has to move to  $\text{Spec}\text{PredP}$  at LF anyway. This would be forced, for example, by the requirement that every predicate have a subject (Rothstein 1983), since  $\text{PredP}$  is lexical (cf. Chapter 1). Then, in derivation A, there is another chain at LF, namely a DP chain. The two derivations are identical at LF; they are therefore equally 'costly' (note that further movement of the DP to  $\text{Spec}\text{AgroP}$ , as in Chomsky 1993, will not affect these results, since it will occur in both derivations. This is discussed in §3.7 below).

##### 3.4.2. The modifier problem

The modifier problem is the following puzzle: why is it that the particle can only take modifiers in the V-DP-Prt order? Consider the data in (58).

- (58) a. Vincent sliced his ear completely off.  
 b. \* Vincent sliced completely off his ear.  
 c. Vincent sliced off his ear completely.  
 d. Vincent sliced his ear off completely.

(58a) shows that *off* can be modified by *completely*. (58b) shows that *completely* cannot modify *off* when it precedes the postverbal DP, as is expected under a head movement analysis. It appears from (58c) that *completely* can be stranded by  $P^0$  movement, though (58c) could also involve right-adjunction of *completely*, as in (58d). Given a restrictive theory of modification in which modifiers are XPs adjoined to XPs (the tenability of this position will be questioned in §4.3 below), there are only two possible adjunction sites for *completely*, if it is left-adjointed to some projection of the complement of *slice*. One, shown in (59a-b), is PP.

The other, shown in (59c-d), is SC. Only (59a) represents a substring of a grammatical sentence, as indicated.

- (59) a. sliced [SC his ear; [Pred' [PP completely [PP t<sub>i</sub>; [P off ]]]]]]
- b. \* sliced [SC [Pred off<sub>i</sub>; [PP completely [PP his ear [P t<sub>i</sub>]]]]]]
- c. \* sliced [SC completely [SC his ear; [Pred' [PP t<sub>i</sub>; [P off ]]]]]]
- d. \* sliced [SC completely [sc [Pred' off<sub>i</sub>; [PP his ear [P t<sub>i</sub>]]]]]]

First, note that the Adjunct Prohibition of Chomsky 1986 and McCloskey 1992 prohibits adjunction to XP selected by a lexical head. This immediately rules out (59c-d), as desired. Since nothing prevents DP movement across the adjoined modifier *completely* in (59a), the grammaticality of (58a) is perfectly consistent with this analysis. (59b) requires some further discussion, however. Head movement across an adjunct is usually assumed to be allowed, as in the Norwegian examples in (60).

- (60) a. De lesrer {alltid / egentlig/desverre /ikke} avisa (Nor)  
*they read always/actually/unfortunately/not the.newspaper*  
'They {always/actually/unfortunately/don't} read the newspaper'
- b. De lesrer desverre alltid avisa.  
*they read unfortunately always the.newspaper*  
'They unfortunately always read the newspaper'

Why, then, should (59b) be blocked? One possibility is simply that Case is assigned under adjacency (cf. Chomsky 1981, Stowell 1981), even when it is assigned by an element in a head-chain with a Case-assigner. The problem with this is that it is quite unclear why objective Case should be subject to this restriction; cf. Johnson 1991 for some discussion and a proposed solution. Another possibility is that head movement in (59b) is blocked; some adverbial adjunctions do interfere with head movement, despite the data in (60) (cf. Lasnik & Saito 1992). Consider the English examples in (61).

- (61) a. \* Will next year he go to Norway?
- b. \* Should in the meantime the board hire a replacement?

But if *completely* in (59b) makes PP into a barrier, shouldn't (59a) be blocked as well? It is plausible that in some cases, a barrier for head movement is not a barrier to DP movement. Compare the examples in (62) with those in (61); although the adjuncts are clearly phrasal, they seem to have a stronger effect on head movement than on WH-movement.

- (62) a. ? I wonder who next year they'll invite to Norway.
- b. ? I wonder what in the meantime the board should do.

These examples are marginal, but improve with the right intonation, whereas the examples in (61) are quite hopeless. Perhaps (62a-b) are just stylistically bad; there are, after all, many ill-understood restrictions on the placement of adverbials.

This is less than conclusive, which makes the Case account more attractive. I will return later to the issue of the overall plausibility of the Case account. One more remark needs to be made regarding the modifier problem: the modifiers *right*, *straight* and *the fuck* pattern with *completely* in (58a-b) (and (59a-d)), but cannot be right-adjoined, and so do not appear in the position of *completely* in (58c-d). There are many adjuncts which require left adjunction (for example the adjective *mere*, or the adverb *never*), so there is nothing particularly unusual about these modifiers in that respect. Some data will be considered in §4, however, below that suggests that at least *right* may be an X<sup>0</sup> modifier, that is, adjoined to X<sup>0</sup> and capable of moving with the particle under certain circumstances (cf. den Dikken 1992:104-8, who suggests that *right* is adjoined to X<sup>0</sup>, but argues that it cannot be moved along; it seems that at least some heads can be moved, however, for example *back* in *Take the top back down/Take back down the top*).

### 3.4.3. The DP complement problem

This account also provides a natural explanation for the DP complement problem noted in §1, that is, the fact that although a PP complement to a particle can be stranded by particle movement, as in (63a), a DP complement cannot be, as in (63b).

- (63) a. Max rolled up the ball over the ridge.
- b. \* Max rolled up the ball the hill.

According to the proposal outlined in this section, the sentences in (63) have D-structures like that in (64a), and S-structures like (64b-c).

- (64) a. Max rolled [sc [PP the ball up {the hill/over the ridge}]].
- b. Max rolled [sc up<sub>i</sub> [PP the ball t<sub>i</sub> over the ridge]].
- c. \* Max rolled [sc up<sub>i</sub> [PP the ball t<sub>i</sub> the hill]].

In (64b), the particle enters into a head chain with the verb, and assigns Case to SpecPP, as already discussed. The PP complement *over the ridge* remains in its original position. In (64c), on the other hand, the particle is the Case-assigner for *the hill*; this prevents it from entering into a Case-chain with the verb, following assumptions about head-chain formation

established in Chapter 1 (following Sigurðsson 1990). There is a single head-chain in (64) with a single Case-assigning potential (cf. also Holmberg 1986:202 for a similar observation).

It is interesting to note that a PP headed by *of* behaves like a DP in this context, as seen in (65).

- (65) a. The wind broke the branch off of the tree.
- b. \* The wind broke off the branch of the tree.
- c. The monster chased the children out of the house.
- d. \* The monster chased out the children of the house.

It seems that *of* is licensed by the particle under the same conditions that allow it to assign Case; since the particle moves to Pred<sup>0</sup> only in order to transmit Case from V, it cannot license *of* if it moves.

#### 3.4.4. The pronoun problem

Den Dikken 1992:101 suggests that pronouns cannot receive Case from a head chain; if this is correct, then the analysis sketched so far accounts for the pronoun problem as well (recall that this was the fact that unstressed personal pronouns must precede the particle).

- (66) a. Max put [sc it; [pp t<sub>i</sub> down]].
- b. \* Max put [sc down; [pp it t<sub>i</sub> ]].

In (66a), the pronoun *it* gets Case directly from the verb *put*; but in (66b), it can only get Case from *down*; if *down* in (66b) is inherently intransitive, and only becomes a Case-assigner by virtue of forming a head-chain with *put*, then *it* gets Case from a head-chain in (66b), which according to den Dikken's hypothesis is impossible. This account raises some questions, for example: why should pronouns not be able to receive Case from a head-chain?<sup>16</sup> And why should *down* not be able to assign Case of its own in (66b), since in other constructions it does assign Case (e.g. in *The hill was steep so we rolled down it*)?

<sup>16</sup> In support of his proposal den Dikken points out that pronouns are bad in other constructions where a DP is claimed to receive Case indirectly, such as locative inversion (in [ia]) and double-object constructions (in [ib]) (examples from den Dikken 1992:99).

- [i] a. Down the hill rolled {the baby carriage/\*it}.
- b. John sent the stockholders {the announcement/\*?it}.

I believe that constructions like [ia] are subject to heavy constraints having to do with the informational value of the final DP, and that pronouns are unlikely to satisfy those constraints. The same objection cannot be raised with respect to [ib], however.

The pronoun problem is clearly part of a larger problem having to do with the special placement requirements of pronouns not only in English but cross-linguistically. Consider the data in (67), from Zwicky 1986.

- (67) a. Martha told Noel {the plot of Gravity's Rainbow/\*it}.
- b. Across the plains came {the Twentieth Century Limited/\*it}.
- c. Posing on the couch was {Henry Kissinger/\*he}.
- d. "Gee whillikers!" exclaimed {Oona/\*she} with great feeling.

Zwicky points out that stress improves the status of pronouns in such examples; at least the verb-particle constructions can be made completely grammatical this way, as in (68a) (cf. also Jespersen's examples in fn. 1 above), and so perhaps can the quotation inversion example, as in (68b) (from Zwicky 1986) and the ditransitive, as in (68c).

- (68) a. They took in HER, and we took in HIM.
- b. "Gee whillikers!" exclaimed SHE, of all people.
- c. No, Noel didn't tell Martha those jokes, Martha told Noel THEM.

The same pattern is replicated in OBJECT SHIFT in Scandinavian (cf. Holmberg 1986, Vikner 1990, Diesing & Jelinek 1993, Josefsson 1992, 1993, and Holmberg & Platzack forthcoming). Object shift occurs when a main verb moves out of VP, as in a V2 structure; a light object pronoun moves to a position outside VP. This can be seen in (69a). If the direct object is coordinate or stressed, as in (69b), or if it is a full DP, as in (69c), it does not undergo object-shift.

- (69) a. Studentene leste {dem} ikke {\*dem}. (Nor)  
*the.students read them not them*  
'The students didn't read them'
- b. Studentene leste ikke DEM  
*the.students read not them*  
'The students didn't read THEM' (...'they read the other ones')
- c. Studentene leste {\*bøkene} ikke {bøkene}.  
*the.students read the.books not the.books*  
'The students didn't read the books'

I will assume that the pronoun problem is a prosodic issue; I will return to it in §3.5. However, nothing in the present account is compromised if den Dikken's analysis is adopted instead, and it is simply assumed that pronouns cannot receive Case from head-chains.

### 3.4.5. The problem of determining what can undergo particle shift

Consider another one of the problems mentioned in §1, the problem of determining what shifts (some of the examples in (17) in that section are repeated here as (70)). Ordinary prepositions do not shift, as noted in (70a). This is because there is no small clause, hence no functional head position for the preposition to move to (besides, the DP gets Case directly from P, so there's no motivation for movement).

- (70) a. Sam climbed {up} the tree {\*up}.
- b. Bernadette pushed {\*sideways} the latch {sideways}.

(70b) indicates that elements other than the basic locative prepositions do not participate in particle shift. This could be explained if, in order to transmit Case from  $V^0$ , an element must itself be a potential Case-assigner; *sideways* is not a Case assigner (\**sideways the path*; cf. *{down/up/on/off} the path*) and therefore cannot transmit Case from the head of SC to the Spec of the embedded predicate. This explanation leaves some facts unexplained; I will return to the matter momentarily.

Another problem raised in §1 was that particles in other small clauses do not shift, as indicated in (71).

- (71) a. The umpire considered {\*out} the runner {out}.
- b. I want {\*out} that dog {out}.
- c. We saw {\*on} the lights {on}.

This fact falls out from the current proposal, under the assumptions outlined so far. Recall that in general, the verb and the particle in the verb-particle construction combine to form an idiosyncratic meaning, whereas the kinds of small-clause taking verbs exemplified in (71) combine with their complements in a strictly compositional way. This means, for our purposes, that the verb in the verb-particle construction non-locally l-selects the head of the predicate of its complement. Above, I proposed that such cases of non-local l-selection became local at LF by head movement of the selected item. Since  $P^0$  moves to  $\text{Pred}^0$  at LF, it seems plausible that it may do so at S-structure, given some motivation to do so (in this case, Case assignment); the heads of the predicates in the SCs in (71) are not l-selected, and do not ever have to move to  $V^0$ .<sup>17</sup>

<sup>17</sup> This could actually be used as an argument against Stowell's restructuring account involving abstract head-movement. If Stowell were right, and the small clause head moves up to  $V^0$  in the general case, then I would have no explanation for the fact that it is not generally possible to form a Case-chain with a small clause head in  $\text{Pred}^0$ , and leave the small clause subject in the lexical XP.

This view of matters is supported by the fact that the class of elements that undergo particle shift is idiosyncratic, depending on particular lexical verb-particle combinations; consider the alternations in (72), which I believe are instances of so-called particle shift.

- (72) a. Walter brought {home} a puppy {home}.
- b. Frank put {together} a jigsaw puzzle {together}.
- c. The wind blew {open} the door {open}

Notice that unstressed pronouns must precede the particle, as shown in (73).

- (73) a. Walter brought {\*home} him {home}.
- b. Frank put {\*together} them {together}.
- c. The wind blew {\*open} it {open}

The secondary predicates in (72) do not productively make verb-particle combinations; the examples in (74) are all bad with the shifted order.<sup>18</sup>

- (74) a. Walter drove {\*home} a puppy {home}.
- b. Frank placed {\*together} the candlesticks {together}.
- c. The wind blew {\*closed} the door {closed}.

However, *Walter drove home his point* is acceptable, with the meaning 'Walter made his point understood.' This is exactly the pattern we expect: idiomatic combinations should, in general, allow shift (provided they are causative; cf. §5), while non-idiomatic ones, such as those in (74), may not.

Thus each of the combinations must be listed. This leads us to expect that licit verb-particle combinations will vary from dialect to dialect or even from speaker to speaker. For example, *let go* for many speakers allows the alternation in (75a), and *make clear* for another set of speakers (perhaps partially overlapping) allows the alternation shown in (75b), and similarly for (75c).

- (75) a. Let {\*go} my foot {go}!
- b. I would like to make {\*clear} my proposal {clear}.
- c. Jasper set {\*free} the bears {free}.

For speakers who allow the 'shifted' variants, I claim, the relative 'weight' of the postverbal DP is irrelevant (all speakers, presumably,

<sup>18</sup> Again, Heavy NP Shift must be controlled for.

have HNPS). Norwegian has similar examples, such as those in (76) (from Åfarli 1985:2 and 16; I retain his Nynorsk spellings).

- (76) a. Jon heiste {løs} bilen {løs}. (Nor)  
*Jon hoisted free the.car free*  
 'Jon hoisted the car free'
- b. Vi jaga {heim} hunden {heim}.  
*we chased home the.dog home*  
 'We chased the dog home'

Åfarli (1985) points out that the specific combinations which undergo particle shift vary from dialect to dialect; he provides the examples in (77), where the fronted variants of (77a) is acceptable in his dialect (Trøndelag), but not in Standard Norwegian (Oslo dialect). Only core color words undergo shift, apparently; thus even for Åfarli, the fronted order in (77b) is bad (the examples are from his page 6).

- (77) a. Vi måla {gul} bilen {gul}. (Nor)  
*we painted yellow the.car yellow*  
 'We painted the car yellow'
- b. Vi måla {\*fiolett} bilen {fiolett}.  
*we painted violet the.car violet*  
 'We painted the car violet'

Although there is considerable lexical variation in the verb-particle construction, it is not completely unconstrained. All cases of possible shift have a causative interpretation, as discussed in §5; and certain particles enter into completely productive patterns; this is also discussed in §5.

#### 3.4.6. Additional evidence from quantifier float

As an additional piece of evidence for the analysis, consider the pattern of quantifier float seen in (78) below (cf. Kayne 1975 and Maling 1976 for early discussion of this pattern).

- (78) a. Barchan cleaned all the bugs off.  
 b. Barchan cleaned off all the bugs.  
 c. Barchan cleaned the bugs all off.  
 d. \* Barchan cleaned off the bugs all.  
 e. \* Barchan cleaned the bugs off all.

The DP *all the bugs* may appear to the left or the right of the particle, as shown in (78a-b). When it appears to the left of the particle, the quantifier may be 'floated' to its right, as in (78c); this is impossible when the DP

appears to the right of the particle, as indicated in (78d). Nor can the quantifier be floated farther to the right, across the particle, as shown in (78e).

Sportiche 1988 proposes that quantifier float is the result of leftward movement of a subpart of a DP; if *all* is a DP-adjunct, or a quantifier taking a DP complement, then quantifier float is the leftward movement of a DP, e.g. *the bugs* in (78), stranding the quantifier *all* in some specifier position formerly occupied by the entire DP; in other words, the quantifier does not move at all. Now consider the structures assigned to (78a-c), assuming the analysis of the verb-particle construction developed in this section.

- (79) a. Barchan [vpcleaned [sc all the bugs; [Pred' Pred<sup>0</sup> [PP t; [Poff]]]]]]  
 b. Barchan [vpcleaned [sc [Pred'Off; [PP all the bugs [P t; ]]]]]]  
 c. Barchan [vpcleaned [sc the bugs; [Pred' Pred<sup>0</sup> [PP all t; [Poff]]]]]]

Recall that according to the analysis developed so far we have movement of a DP in those cases (such as (78c)) in which the DP precedes the particle. In the cases (such as (78b)) in which the particle precedes the DP, there is only head movement (of P<sup>0</sup> to Pred<sup>0</sup>). Since Q-float depends on DP-movement, this means that we expect Q-float to appear in the DP-Prt order, and not in the Prt-DP order. This is just what is seen in (78). The relevant structures are illustrated in (79).

In (79a), the DP *all the bugs* has moved to SpecPredP; in (79c), only *the bugs* has moved, and *all* is stranded in SpecPredP, to the left of *off*. When the DP is to the right of *off*, it has not moved; it remains in its base-position, as in (79b), and no quantifier float is possible. Thus exactly the grammatical patterns are possible, given my analysis, and there is no source for the ungrammatical examples in (78d-e). I am aware of no other account of the verb-particle construction that handles this data neatly.

#### 3.4.7. Pseudopassives

The assignment by proxy of the verb's Case by the particle is reminiscent of another construction, namely the pseudopassive, illustrated in (80).

- (80) a. This bed was slept in by George Washington.  
 b. The desk was sat on by a gorilla.  
 c. The solution has often been talked about.

Recall the standard GB analysis of passive: the external argument of the verb is suppressed, and (in accordance with Burzio's 1986 Generalization) the verb loses its ability to assign Case. Some accounts, such as that of Baker, Johnson, & Roberts 1989, link the loss of Case

directly to the passive morphology. In the pseudopassive, the verb shows passive morphology and loses its external argument, but it is the preposition that seems to lose its ability to assign Case.

Van Riemsdijk 1978, Hornstein & Weinberg 1981, and Chomsky 1981 argue that the verb and the preposition combine in cases like those in (80) by a process they call REANALYSIS; each of the works cited has a different conception of the extent of reanalysis, but they agree, I think, on the cases in (80). There are some restrictions on the pseudopassive; it does not apply in general to any verb and any preposition. One restriction that is usually assumed to apply to the construction is that the verb and preposition must be adjacent, as indicated in (81).

- (81) a. \* This bed was slept restlessly in by George Washington.  
 b. \* Gerard was given a book to.  
 c. \* The solution has been talked often about.

Possibly, then, the pseudopassive is made possible by the same thing that makes particle shift possible: P<sup>0</sup> forms a Case-chain with V<sup>0</sup>. However, the Case-chain in this case seems to be 'backwards' in a sense. Intransitive verbs are ordinarily assumed to have an unspecified value for the feature 'Case-assignment' (or perhaps they are specified negatively), but in English passive applies only to verbs specified as "+" (according to Baker, Johnson, & Roberts 1989, the passive morpheme needs Case). In the pseudopassive, a head-chain allows the verb (the 'initial' of the Chain, in Sigurðsson's terms) to receive the positive specification from the preposition (the 'terminus'). This is backwards with respect to the usual head-chain (cf. Chapter 1); in fact, the definition adopted there would not allow it, since it is stipulated that the terminus inherits the initial's specification.

There is another way to analyze the pseudopassive that would involve a 'forward' head-chain. Say that a transitive preposition must discharge its Case; this prevents A-movement from the complement of a preposition in the general case (there are no constructions like \*Mary seems to that it is raining). Passive morphology might specify a verb as "-" ('minus') for the feature Case-assignment; then the head-chain passes that value down to the preposition. But this violates another condition on head-chain formation, since non-initial members are supposed to be unspecified for the relevant feature. It seems that the pseudopassive must be regarded as slightly exceptional however it is analyzed. Perhaps this accounts for the cross-linguistic rarity of the construction (it is impossible in French and the other Romance languages, as well as in Dutch and German, cf. van Riemsdijk 1978; Icelandic, Maling & Zaenen 1985;

some varieties of Swedish, Ejerhed 1981; and in Danish, cf. Herslund 1984).

The fact that the chain is somehow exceptional might also account for the adjacency requirement. There are, however, some counterexamples to the adjacency requirement, such as those in (82) (van Riemsdijk 1978:220 notes (82c); (82b) is from Bresnan 1978:21).

- (82) a. You'll be taken good care of in the Sunshine Villa.  
 b. The closet was made use of.  
 c. The hapless tourists were really taken advantage of.  
 d. The doctors are always being made fun of.

The constructions in (82) involve idioms. Note that modification of subparts of the idiomatic strings *take (good) care of*, *make use of*, *take advantage of*, and *make fun of* reduces the acceptability of the passive forms.

- (83) a. ??You'll be taken excellent care of in the Sunshine Villa.  
 b. \*? The closet was made ingenious use of.  
 c. \*? The hapless tourists were taken great advantage of.  
 d. \* The doctors were always being made cruel fun of.

Possibly, a head-chain can be formed exceptionally in the constructions in (82) simply because they involve idioms, which are listed in the lexicon.

### 3.5. Prosody<sup>19</sup>

One problem that has not yet been discussed is the intonation problem, i.e. the fact that the particle (when it precedes the postverbal DP) forms an intonational unit with the verb, unlike an ordinary preposition. The data from (13) in §1 is repeated here in (84).

- (84) a. The 'passenger 'flew in the 'plane.  
 b. The 'pilot flew 'in the 'plane.  
 c. 'Maggie 'looked up the 'tree (to see if her cat was there).  
 d. 'Maggie looked 'up the 'tree (in her *Field Guide to North American Trees*)

It is generally accepted that syntactic constituency is relevant to prosodic constituency (cf., e.g., Selkirk 1984). On the face of it, then, the patterns

<sup>19</sup> I am indebted to Kari Swingle for very helpful discussion of the matters dealt with in this section.

in (84) would seem to support an analysis in which the verb and the particle form a syntactic constituent (cf. the discussions in §2 of Chomsky 1955 and Svenonius 1992b). Consider, for example, the prosodic parsing rules proposed in Hayes 1989; in (85) I give his rules for the formation of Clitic groups.

(85) Clitic group formation (Hayes 1989:208)

- a. Every content word (lexical category) belongs to a separate Clitic Group.
- b. Definition: The HOST of a Clitic Group is the content word it contains.
- c. Definition: X and Y SHARE CATEGORY MEMBERSHIP in C if C dominates both X and Y.
- d. Rule: Clitic words are incorporated leftward or rightward into an adjacent Clitic Group. The group selected is the one in which the clitic shares more category memberships with the host.

A CLITIC GROUP is a particular level of organization of prosodic structure; following Nespor & Vogel 1986, a Clitic Group is built up of Phonological Words, and a Phonological Phrase is built up of Clitic Groups (above the Phonological Phrase is the Intonational Phrase). The rule in (85d) refers to syntactic structure, because the definition of sharing category membership (in (85c)) refers to syntactic structure. Now, consider how example (84a) is parsed by the rules in (85). In (86a), each content word is set off with brackets, because each will define its own Clitic Group. In (86b) Clitic Groups are formed; the function words (Hayes' "clitic words") are incorporated into the Clitic Group defined by the closest content word, following the rule in (85d). In (86c), a single stress mark is assigned to each of the Clitic Groups, giving the stress pattern shown in (84a).

- (86) a. The [passenger] [flew] in the [plane]  
      b. [cthe passenger] [cflew] [cin the plane]  
      c. [cthe 'passenger] [c'flew] [cin the 'plane]

Now consider (84b). Parsing of (84b) will be identical to (86), if Hayes' rules are followed, given the analysis proposed here, since although P<sup>0</sup> has moved to Pred<sup>0</sup>, it still shares more category memberships with the DP than with the V (since Prt and DP are dominated by more nodes than are V and Prt). However, consider that complementizers in English often seem to associate leftward, with the verb (as in (87a)), rather than rightward, with the embedded subject; and that auxiliaries also typically

associate leftward (as in (87b)), unlike determiners and prepositions, even though this violates Hayes' rule. This is most clearly seen when the auxiliary actually cliticizes to the subject, as in (87c).

- (87) a. [I 'know that] [he 'said that] [you 'like him].  
      b. ['John is] ['leaving].  
      c. John's leaving.

The facts in (87) could be accounted for by augmenting Hayes' (85) with a special stipulation that function words of the categories C<sup>0</sup> and V<sup>0</sup> associate with the Clitic Group to their left; or, we could say that function words occupying C<sup>0</sup> or Infl<sup>0</sup> nodes associate with the Clitic Group to their left. By explicitly implicating the structural position, rather than the lexical category, we allow an account for the prosodic properties of the verb-particle construction: an element in Pred<sup>0</sup> associates leftward. This means we do not have to make a distinction between the category of *in* in (84a) and *in* in (84b); the different prosodic effects are the result of the same lexical element occupying two different structural positions, a distinction which is independently motivated. (84b) will then be parsed prosodically as in (88).

- (88) a. The [pilot] [flew] in the [plane]  
      b. [cthe pilot] [cflew in] [cthe plane]  
      c. [cthe 'pilot] [c'flew 'in] [cthe 'plane]

In (88a), the content words are identified; in (88b), the function words associate with the appropriate Clitic Group; the determiners follow Hayes' rule, and the particle is subject to our special auxiliary stipulation. In (88c), one main stress is assigned to each Clitic Group (I am simplifying matters by ignoring the construction of prosodic phrases and intonational phrases).

The prosodic account developed here might be used to explain some recalcitrant problems associated with the verb-particle construction. For one thing, prosody might be used to explain the pronoun problem; recall from §1 that when pronouns appear with contrastive stress, or when they are coordinated, they may follow the particle, as in (89b-c).

- (89) a. The bouncer threw {\*out} him {out}.  
      b. The bouncer threw out HIM.  
      c. The bouncer threw out him and her.

Den Dikken's account for the pronoun problem, that pronouns cannot receive Case from a head chain, seems to incorrectly prevent (89b-c); it is unclear why stress should have anything to do with Case assignment. If,

on the other hand, prosodic considerations dictated that the pronoun attach to a content word, and the particle does not qualify, then the pronoun problem would be accounted for. Stress is known to allow a function word to define its own Clitic Group, and a coordinate structure like the coordinated pronouns in (89c) would also be able to define its own Clitic Group.<sup>20</sup>

The prosodic account can also be extended to account for the coordination problem. Recall that the DP-Prt sequence can be coordinated, but that the Prt-DP sequence cannot, as in (90).

- (90) a. Turn the TV on and the lights off.
- b. \* Turn on the TV and off the lights.

On the analysis outlined in this section, both of the sentences in (90) should be coordinations of PredP; in (90a), there has been an internal movement of DP from SpecPP to SpecPredP in each half of the coordinate structure, and in (90b) there has been an internal movement of P<sup>0</sup> to Pred<sup>0</sup> in each half. Now, if the particle in Pred<sup>0</sup> were a clitic, and truly prosodically dependent on V<sup>0</sup>, then (90b) would be like (91a), in which a clitic auxiliary is leftmost in the second conjunct.

- (91) a. \* John's tired and 's going to be leaving soon.
- b. John's tired and is going to be leaving soon.

A left-leaning clitic cannot in general appear at the left edge of a right conjunct, nor at the left edge of a displaced constituent. Of course, the particles are not true clitics; they are more like the unstressed function word in (91b), which is perfectly licit at the left edge of a right conjunct.<sup>21</sup> Thus cliticization cannot by itself be the answer. However, an account is available within the literature on prosody.

Hayes' rules for the construction of phonological phrases from Clitic groups incorporates the observation (cf. Nespor & Vogel 1986) that a prosodically light complement may be incorporated into the phonological phrase of its immediately preceding head; 'prosodically light,' for Hayes, is defined as "consisting of only one Clitic group". This

<sup>20</sup> Recall that stress and coordination can also allow pronouns not to undergo Object shift.

<sup>21</sup> A problem is that if P<sup>0</sup> is going to move to V<sup>0</sup> at LF, then movement of two different P<sup>0</sup>'s to the same V<sup>0</sup> at LF must be allowed. This might suggest that the weaker of the two versions of c-selection suggested in Chapter 1 might be the right one (namely, that P<sup>0</sup> need only move to Pred<sup>0</sup> in order to be 'close enough' for V to check its categorial features). In any case, this issue does not seem to shed light on the coordination problem.

allows, for example, *comprehend everything* to be treated either as two phonological phrases or as one, because *everything* defines a single Clitic group and is complement to *comprehend*, while *comprehend Mary's problems* must be two phonological phrases (Swingle's 1993 example).

- (92) a. [φP [ccomprehend]] [φP [c everything]]
- b. [φP [ccomprehend] [c everything]]
- c. [φP [ccomprehend]] [φP [c Mary's] [c problems]]

Swingle 1994 notes, based on data from Right Node Raising (RNR), that small clause subjects (specifically consider-type SCs) do not appear to form a phonological phrase with their predicate; rather, the facts are more consistent if SC subjects optionally incorporate into the phonological phrase of the preceding verb as if they were objects of that verb. As Swingle notes, this could be taken as evidence against a small clause analysis of these structures (in fact Postal 1974 made this argument based on the assumption that the 'raised' material in RNR constructions is always a syntactic constituent, an assumption which Abbott 1976 shows to be false). However, this relies crucially on a very specific formulation of the rule for phonological phrase construction; for Hayes, a complement of X<sup>0</sup> is specifically mentioned in the formulation of the rule. If instead we adopted some notion like SELECTIONAL DOMAIN, then we could capture the observed facts: let the selectional domain of X<sup>0</sup> be a head that X<sup>0</sup> l-selects (i.e. a head that X<sup>0</sup> places categorical restrictions on; independent properties of head-head relations will require that that head be local to X<sup>0</sup> in the sense defined in Chapter 1; a head is local to X<sup>0</sup> if it is the head of the complement of X<sup>0</sup>, or adjoined to the head of the complement of X<sup>0</sup>). Assume that a head can form a phonological phrase with a head that it l-selects. Then *depend* can form a phonological phrase with *on, look with up, arrange with for*, etc. See *won't* form a phonological phrase with *the in see the dog*, because it doesn't place any l-selectional restrictions on *the*.

Now the account is almost in place; only one more observation is needed, namely the observation that the optional prosodic incorporation of light material to the preceding head is obligatory for unstressed pronouns unless they are the final element in the sentence; in other words, the incorporation rule is actually obligatory, but there is also a right-edge rule which allows a constituent at the right edge of a sentence to become a phonological phrase.

The result of this machinery, which is all independently motivated, is that an unstressed pronoun acting as a SC subject will be illicit at the left edge of a coordinate structure, because it needs to incorporate with the preceding V<sup>0</sup> (it is important to avoid stressing the pronouns):

- (93) a. Max saw Mary jump and John laugh.  
       b.\* Max saw her jump and him laugh.

The contrast is striking; (93b) can only be rescued by putting contrastive stress on the pronouns. Now, if we assume that a particle in  $\text{Pred}^0$  has the same prosodic status as an unstressed pronoun, the account extends naturally to (94).

- (94) a. I turned the oxygen on and the gas off.  
       b. \* I turned on the oxygen and off the gas.

Again, (94b) can be improved by placing contrastive stress on the particles; this promotes them to a status sufficient to form their own phonological phrases.

### 3.6. On the differences among the Scandinavian languages

I have outlined a proposal where the movement of some element in PP (either the DP in SpecPP or the  $P^0$  head) into the functional projection dominating PP is necessary in order for the postverbal DP to get Case. Now how to account for the Scandinavian problem noted in §1? Recall that Danish has no particle shift (the examples in (95) are adapted from Herslund 1993:56).

- (95) a. Boris skrudde {\*ned} musikken {ned}. (Dan')  
       *Boris screwed down the.music down*  
       *'Boris turned the music down'*  
     b. Boris flyttet {\*rundt} møblene {rundt}.  
       *Boris moved around the.furniture around*  
       *'Boris moved the furniture around'*  
     c. Boris skrev {\*under} kontrakten {under}.  
       *Boris wrote under the.contract under*  
       *'Boris signed the contract'*

We can model this in the current proposal by saying that Danish lacks the possibility of moving  $P^0$  to  $\text{Pred}^0$ , or that  $P^0$  in  $\text{Pred}^0$  does not gain the Case-assigning properties of  $V^0$ . Recall that Danish cannot form pseudopassives, which might indicate that it is generally unable to form a Case-chain between  $V^0$  and  $P^0$ . It does not seem that Danish is unable to form Case chains in general, as it has impersonal constructions, which might involve assignment of Case via a head chain, following Sigurðsson 1990. Thus we are simply stipulating that Danish has no rule of V-P reanalysis, much as previous work on reanalysis, e.g. van Riemsdijk 1978 or Hornstein & Weinberg 1981 stipulated for languages like French (cf. also Maling & Zaenen 1985 on Scandinavian languages).

Let us turn, then, to Swedish. Recall that Swedish has obligatory particle shift, as shown in (96) (examples adapted from Holmberg 1986:200).

- (96) a. Johan skrev {upp} numret {\*upp}. (Swe)  
       *Johan wrote up the.number up*  
       *'Johan wrote down the number'*  
     b. Han lämnade inte {in} uppgaven {\*in}.  
       *he handed not in the.assignment in*  
       *'He didn't hand in the assignment'*  
     c. Nyström spelade helt enkelt {ut} honom {\*ut}.  
       *Nyström played quite simply out him out*  
       *'Nyström quite simply outplayed him'*

As Holmberg points out, particle shift is obligatory even when the postverbal DP is an unstressed pronoun, as indicated in (96c) (though Swedish does have Object Shift; cf. Holmberg 1986, Josefsson 1992). We could say, then, that reanalysis (i.e. the formation of a Case-chain between  $V^0$  and  $P^0$ ) is obligatory in Swedish. Why should this be so? In the Minimalist program, obligatory pre-Spell-out movement is ordinarily forced by 'strong' features, which must be supported by overt lexical material. Could Swedish have strong head-features in (Raising)  $\text{Pred}^0$ ? At first sight this seems implausible, if any connection is to be made between strong features and overt morphology, since Swedish particles never show anything like agreement. However, the connection between strong features and overt morphology often turns out to be rather weak; consider the fact that in Chomsky 1993, English is supposed to have strong NP features in Agrs, in order to force an overt subject to move to SpecAgrsP prior to Spell-out; yet only five lexical items in English show anything that could plausibly be called overt Nominative m-case (namely *I, he, she, they, and we*). Now, the fact that Swedish has agreement on participles, in contrast to Danish and Norwegian, suggests that there might be some hope in analyzing Swedish as having a strong feature in  $\text{Pred}^0$ . This is shown in (97-98), where Swedish requires number agreement and Norwegian and Danish simply use the singular form (the plural form is only used as an attributive adjective; I have argued at length in Svenonius 1993b and 1993c that attributive adjective agreement is crucially different from Spec-head agreement, which is presumably what Swedish has in (97-98)).

- (97) a. Hunden är {bunden/\*bundna}. (Swe)  
       b. Hunden er {bundet/\*bundne} (Nor)  
       c. Hunden er {bundet/\*bundne} (Dan)  
*the.dog is tied.SG/tied.PL*

- (98) a. Hundarna är {\*bunden/bundna}. (Swe)  
       b. Hundene er {bundet/\*bundne} (Nor)  
       c. Hundene er {bundet/\*bundne} (Dan)  
*the.dogs are tied.PL/tied.SG*

(97-98) suggest that Swedish has a kind of strong agreement feature that is lacking in Norwegian and Danish. The examples in (99) show one kind of small clause structure that uses these participles, and here, too, Swedish shows obligatory agreement (here gender agreement is shown), while Norwegian and Danish make do with a single form (see Hedlund 1992 for extensive discussion of the construction type in (99a) and related constructions in Swedish).

- (99) a. Jag fick boken {skriven/\*skrivet} (Swe)  
*I got the.book written.M/written.N*  
       b. Jeg fikk boka skrevet (Nor)  
*I got the.book written*  
       c. Jeg fik skrevet bogen (Dan)  
*I got written the.book*  
*'I got the book written'*

Thus, for Swedish to have a strong inflectional feature lacking in the other MS languages is not utterly implausible; this would motivate the claim made above that particle-shift is obligatory in Swedish.

If strong agreement on participles motivates obligatory particle movement, then Icelandic should have obligatory particle movement, since Icelandic has overt agreement on participles, as demonstrated in (100).

- (100) a. Báturinn er farinn/\*farið (Ice')  
*the.boat is left.M.SG/left.N.SG*  
*'The boat has left'*  
       b. Skipið er farið/\*farinn  
*the.ship is left.N.SG/left.M.SG*  
*'The ship has left'*

However, Icelandic allows both word orders in the verb-particle construction, as seen in (101), with a number of different quantified DPs.

- (101) a. Við hentum út {mörgum/flestum/nokkrum/öllum} hundum.  
       b. Við hentum {mörgum/flestum/nokkrum/öllum} hundum út.  
*we threw out many most some all dogs out*  
*'We threw out {many/most/some/all} dogs'*

One possibility is that the particle obligatorily moves to Pred<sup>0</sup>, but then the DP optionally moves in addition to SpecPredP. This preserves the correlation between agreeing participles and obligatory movement.<sup>22</sup> But it raises another question: why should there be optional DP movement to SpecPP, if the DP gets Case in SpecPP from the moved P? It is possible that interpretive factors control this movement in Icelandic. That this is true is suggested by the following facts: when the postverbal DP is a simple definite, as in (102a), there is a preference, at least for some speakers, for it to precede the particle, and when it is indefinite, it is preferred that it follow the particle, as in (102b).

- (102) a. Við hentum {?út} hundinum {út}. (Ice)  
*we threw out the.dog out*  
*'We threw the dog out'*  
       b. Við hentum {út} hundi {?út}.  
*we threw out dog out*  
*'We threw out {a dog/the dog}'*

This pattern is reminiscent of Object shift, though not identical to it; Object shift is generally considered to be optional for definites, impossible for indefinites, whereas the placements in (102) appear to be preferences rather than absolutes.<sup>23</sup> Let us assume, however, that Object

<sup>22</sup> However, it is not clear that that is an important correlation. Icelandic in general has a very active agreement system; it is possible that the particles do not count as having strong agreement in that language, since they are not overtly inflected, even if they could pass as having strong agreement in Swedish. So it seems that the data in (100) is not decisive.

<sup>23</sup> Diesing & Jelinek 1993:24 claim that an indefinite DP in Icelandic can undergo Object shift if it has a strong reading, as in [i] (cf. their ex. (49)):

[i] Ég LES bækur ekki, ég bara kaupi þeir (Ice)  
*I read books not, I just buy them*  
*'I don't READ books, I just buy them'*

However, the contrastive stress in [i] is apparently crucial. In a non-contrastive context with a strong-reading indefinite, object-shift is impossible, as in [ii] (modelled on Diesing's 1992:108 German example, where scrambling of the direct objec forces a strong reading).

(continued next page)

shift is responsible for the preference in (102); the DP, being both light and definite, is preferred in the Object-shifted position; if that position is adjoined to PP, then the particle cannot have moved; if it is adjoined to PredP (in violation of the Adjunction Prohibition), then the particle may have moved. Indefinites, being new information, are preferred in sentence final position, which might account for the preference in (102b) (though it is strange that Icelandic should be so much more sensitive to this than English).

There is one last piece to this puzzle: Icelandic does not allow pseudopassives (Maling & Zaenen 1985, whence (103b)).

- (103) a. \* Hann var hlegið að  
*he was laughed at*  
 b. \* Ég tel refinn aldrei hafa verið skotið á.  
*I believe the fox never have been shot at*  
*'I believe the fox never to have been shot at'*

If the possibility of pseudopassives is any indication, Icelandic should not have particle shift. However, many speakers of Swedish have obligatory particle shift but no pseudopassives. It seems, then, that the possibility of forming a Case chain from  $P^0$  to  $V^0$  is a necessary condition for the possibility of forming pseudopassives, but not a sufficient one.

### 3.7. The Ghost of the Extended Projection Principle

In the Minimalist program of Chomsky 1993, accusative Case is checked at LF in languages like English and Norwegian, in SpecAgro. It is not assigned under government by V, as in Chomsky 1981. If we are to adopt the Minimalist conception of Case-assignment, then the analysis of particle shift outlined in §3.3 cannot be correct. In this section I will explore an alternative account, in which the structures and movements described in §3.3 are retained, but are motivated by considerations other than those of Case assignment.

- 
- [ii] Ottó les {alltaf} bækur um flóðhesta [\*alltaf] (Ice)  
*Otto reads always books on hippopotamuses always*  
*'Otto always reads books on hippos'*

The Icelandic example in [ii] has two readings, just like its English gloss (roughly, 'at any given time, Otto reads books on hippos,' and 'for any given book on hippos, Otto reads it'; cf. Diesing 1992 for discussion). Thus I conclude that the generalization that Object shift is only possible for definite DPs is correct for Icelandic, and that some additional statement needs to be made regarding [i] (cf. de Hoop's 1992 discussion of contrastive predicates).

Recall from Chapter 1 that the requirement that every clause have a subject, loosely referred to as the EPP, could not follow from any fact about argument structure, since subjectless predicates (such as weather predicates and intransitive passives in Germanic) take an expletive subject, with no θ-role (cf. Rothstein 1983, and the discussion in Chapter 1). Nor can the EPP follow from any fact about IP, since it applies to small clauses as well.

- (104) a. I've never seen there be so many roses on one bush.  
 b. I want it cold when I go skiing.  
 c. I consider it important for unpublished work to be summarized.  
 d. They found it out that we were impostors.  
 e. They played it up that they could arrest us.  
 f. They were getting it on.

(104a-c) show that small clauses in general can have expletive subjects. (104d-f) suggest that verb-particle constructions can have expletive subjects as well. (104d-e) are extraposition expletives; they may appear to be optional because of the alternative derivation in which the particle precedes the CP; i.e. extraposition only occurs when the CP precedes the particle, perhaps because of a general requirement that CPs be peripheral in S (cf. Ross' 1967 'Internal S Condition'). (104f) involves a possible dummy pronoun of the pseudo-argument type; see Rizzi 1990, Cinque 1991, Postal & Pullum 1988. *There* is generally excluded from verb-particle constructions because there is no verb, and *there* apparently always needs a verb. Only when a verb-particle construction appears where the particle takes a complement that can have a verb in it could *there* appear (cf. Lasnik's *I consider there likely to be a riot*), as in *They made there out to be more food than there was* (see Kayne 1985, den Dikken 1991, 1992 for extensive discussion of this construction).

Following Rothstein, the EPP is the result of a grammatical requirement that a grammatical predicate have a grammatical subject; in our terms, this just means that something must appear in SpecPredP. But in the Minimalist Program, such a requirement cannot be an S-structural requirement; it can only be an LF condition or a PF condition. Consider first the possibility that the EPP (i.e., the requirement that some DP occupy SpecPredP) is an LF condition. Then we would have to explain why it is that the subject of a Raising Pred structure cannot in general move to SpecPredP at LF. That this is not possible is indicated by the following pattern.

- (105) a. The stunt got the girls arrested.  
 b. \* The stunt got arrested the girls.  
 c. (With) the car fixed, we set out down the road.  
 d. \* (With) fixed the car, we set out down the road.

Alternatively, consider the possibility that the EPP is a PF condition. Compare V2, which is plausibly driven by some PF condition; for example, German and Icelandic have null expletives (as discussed in Holmberg & Platzack 1994) and references cited there; but these null expletives can never satisfy V2; an overt DP must appear in SpecCP in all V2 languages (note also that PRO never satisfies V2; cf. also Anderson 1992). If Warlpiri (see e.g. Hale 1983) is analyzed as a V2 language, it must also be subject to a PF condition, since it apparently has *pro*, but *pro* does not satisfy the need for an overt XP to occupy the pre-aux position. But the EPP is not quite this strict; there are various indications that a nexus, cross-linguistically, must have a subject, but it may be unpronounced (cf. Chomsky & Lasnik 1991, Lasnik 1993). All the same, let us proceed on the assumption that the EPP is a PF condition, although it may be satisfied by some null elements (including trace).

If the EPP is a PF condition, then what we need to explain is why it is that the movement of P to Pred calls this requirement off. One possibility is that the EPP is really an epiphenomenon of a more general requirement that a phrasal structure can only exist if it is filled with something; this is reminiscent of Emonds' 1985 Invisible Category Principle, which requires an overt element to license a syntactic projection; for example, for Emonds, overt morphological Case on a DP might license an empty preposition, allowing PPs with null heads in languages with overt Case (m-case) and prohibiting null Ps in languages with no m-case.

What is needed here is slightly different conception, along the following lines: if there is no overt element in the head position, then there must be an overt element in the Spec position. Call this the ICP account, because the intuition is the same as that behind Emonds' Invisible Category Principle, even though the specifics are different. It may be that the strongest version of this position cannot be maintained; for example, if we adopt the split Infl of Pollock 1989 or Chomsky 1991, then certain functional projections in the clause will have to be allowed without any overt morphological indication of their existence; but for the time being I will assume that the ICP in its strongest form holds at least of PredP: in order for a projection of a head Pred to be interpreted at PF, either Pred or SpecPredP must be filled with something that is interpretable at PF. If the entire PredP projection is empty at PF, the derivation crashes, in the sense of Chomsky 1993. If we do not adopt the

split Infl, then this holds of Infl as well. I would say that it holds of all categories except that allowances will have to be made for DP: such noun phrases as names and bare plurals are apparently DPs with null Ds, following Abney 1987, Stowell 1991b, and Longobardi 1993.

Now, Control Pred is not a problem as a subject is base-generated in its Spec; this subject must appear there prior to Spell-out as there is no access to the lexicon after Spell-out (cf. Chomsky 1993). In the usual case, a DP within the complement to Raising Pred will move up into SpecPredP, satisfying the ICP (i.e. licensing the PredP projection at PF). The movement of DP will be motivated by considerations of Case-assignment, whether we take the traditional view that Case is assigned by the verb (to SpecPredP in this case), or the Minimalist view that Case is checked in SpecAgroP; either way, the DP will have to move to SpecPredP (as a first step, in the Minimalist account). If nothing motivates the movement of the lexical head of the predicate of the small clause to Pred, then it will not be able to move, by Economy. But in the verb-particle construction, the particle must move, because of l-selectional considerations. This leads to the pattern already discussed, where either (106a) or (106b) is a possible surface structure (on the ICP account, either (106a) or (106b) licenses the PredP at PF).

- (106) a. Gregor ironed [sc the wrinkles; [pp t<sub>i</sub> out]].  
 b. Gregor ironed [sc out; [pp the wrinkles t<sub>i</sub>]].

The ICP account makes some predictions not made by the Case-based account of §3.3. For example, consider the situation when the external argument of the particle is optional, as in the cases in (107).

- (107) a. Boris gave (the battle) up.  
 b. Natasha threw (her dinner) up.  
 c. Mikhail called (Raisa's name) out.  
 d. Sonya towed (herself) off.

When the postverbal DPs in (107) are omitted, the constructions can be said to contain an IMPLICIT ARGUMENT (cf. Rizzi 1986, Fillmore 1986, Williams 1987, 1991, Safir 1987, 1991; cf. also my discussion of the *la* causatives in §3.4.5); this is different from PRO or *pro*, as Rizzi 1986 shows; PRO and *pro* occupy structural positions and behave as arguments in various ways (e.g., they can control PRO, as Rizzi demonstrates). Typically, they refer to humans, often generically. Implicit arguments, on the other hand, do not project syntactic structure; they are the effect of the 'tying off' of an argument position in the lexical representation of a verb (again, following Rizzi). The interpretation of an implicit argument is

lexically restricted and context-dependent; the implicit argument of intransitive *eat* is some contextually dependent amount of food, ordinarily a meal; and the implicit argument of *give up* in (107a) is some contextually dependent effort or enterprise, often a game or contest. The verb-particle combination *towel off* in (107d) is more lexically restricted; an overt DP may be non-reflexive (*Sonya toweled Seymour off*), but an implicit argument must be interpreted as a reflexive (cf. *shave*, *wash*, *bathe*, etc.). Note that just as with simple verbs, verb particle combinations do not freely occur with implicit arguments; this is an idiosyncratically specified feature of particular lexical entries (e.g., *eat* and *give up* take implicit arguments, but *devour* and *tear up* do not).

On a Case-theoretic account, when the postverbal DP does not appear, there is no motivation for movement of the particle, so it must remain in  $P^0$ . On the ICP account, on the other hand, when the postverbal DP does not appear, the only way to get lexical material into the functional projection is to move the particle, so it must move up from  $P^0$ . How are we to tell which is the case? There are at least two possible diagnostics for  $P^0$  movement, one being the possibility of modifiers (recall from the discussion of the modifier problem that a moved  $P^0$  cannot be modified), and the other being the possibility of DP complements (recall from the DP complement problem that a particle with a DP complement cannot move). These diagnostics do in fact seem to show that a particle must move when there is an implicit argument, that is, when there is no postverbal DP. I will discuss this evidence below.

#### 4. The argument structure of prepositions

In this section I discuss the argument structure of prepositions, showing that in general, the postverbal DP of the verb-particle construction must be base-generated in SpecPP, not in the complement position of  $P^0$ , as in the accounts of Taraldsen and den Dikken reviewed in §2. I also show some evidence from limitations on word-order in unaccusative verb-particle constructions for the particular proposal made in this chapter.

##### 4.1. Figure and Ground

Prepositions, like verbs, can denote one-place states (or locations) or two-place relations. For example, the preposition *on*, in the examples in (108), denotes an asymmetric relation between two objects which includes at least the following requirements: the two objects are in contact, and either the first one is spatially located above the other (as in (108a)) or the first one is smaller than the other (as in (108b)).

- (108) a. You're on my foot
- b. There's a bug on your sweater

Of course, this is only a very rough approximation of the notion *on* (for fuller discussion see Talmy 1985), but it captures two crucial facts about the relation: it is bivalent, or two-place (in the spatial sense, a thing cannot simply be "on" without being on *something*), and it is asymmetric (compare *My foot is on you* and *Your sweater is on a bug* with the sentences in (108)). Exploiting the parallel between prepositions and verbs, we might call the first element in the relation (the subjects in the examples in (108)) the "external argument," and the second (the complement of *on* in (108)) the "internal argument."

There are also non-spatial uses of *on*, and some of them might be characterized as (one-place) properties or states, rather than as relations; for example, *on* denotes a state enjoyed by motors and electric gadgets (*The headlights are on*). This may historically derive from a bivalent use, but seems to be treated as strictly one-place in Modern English (\**The headlights are on (the battery/power/electricity)*).

Similarly, the preposition *out* is typically a two-place relation: the external argument is an object, and the internal argument is a container, and the relation is such that the container does not contain the object. The relation might be one of movement (Case-assigning *out*), as in (109a), or location (non-Case-assigning *out*), as in (109b).

- (109) a. Seymour climbed out the window.  
       b. Wilma was out of earshot.

Other uses of *out* might be characterized as one-place or two-place; if someone is out, she is generally out of something: depending on context, she might be out of her office, or out of the game. There are other, more abstract, uses, for example *She's out cold* ('unconscious'), or *The fire's out*. Such examples are probably best considered one-place senses of *out*.

Some generalizations can be made about the expression of the arguments of a preposition. The typical use of prepositions is in a prepositional phrase (formed of a P and its complement), which is attached to some projection of some category as a complement or modifier. Some examples are given in (110).

- (110) a. On Saturday, Gina flew a kite.  
       b. Gina broke her kite on her knee.  
       c. The string on Gina's kite was yellow.

In each of the examples in (110), the preposition appears with its internal argument as its complement. The thing modified (plausibly, the IP in (110a), the VP in (110b), and the NP in (110c)) is interpreted as the external argument, at least in some sense. This pattern is never reversed; we never see *the sweater on the pattern* with the interpretation 'the pattern on the sweater.' Taking a modifier to be a kind of one-place predicate, we can make the generalization that a PP modifier always has an open place corresponding to the external argument of P.<sup>24</sup>

Talmy (1978 *inter alia*) uses the terms FIGURE and GROUND (taken from Gestalt psychology) for the arguments of prepositions in general; the Figure corresponds to the theta-role Theme (e.g. Jackendoff 1972) and is the entity whose location or movement is at issue, while the Ground is equivalent to the Goal, Location, or Source of earlier work on thematic roles; it is the relatively immobile object or location with respect to which the Figure is located or moving. In all of the cases which interest us, the external argument of a preposition, or the thing modified by or predicated of a prepositional phrase, is the Figure, and the internal

<sup>24</sup> For example, using the MOD value of Pollard & Sag 1993, the PP *on Saturday* has a MOD value <>, allowing it to modify a phrase by taking its (Davidsonian) event variable as its 'argument', roughly as in Parsons 1990; it seems to be a general principle of the interpretation of PP modifiers that e is to be interpreted as the external argument of the PP (in GB, it would get the external theta-role of P; in HPSG, the MOD value would be structure-shared with the value of SUBJ, or with the first item on the SUBCAT list of P). See also Gawron 1986a for an explicit proposal.

argument is the Ground. Thus we can make the descriptive claims in (111) (these are meant to hold of the spatial prepositions that appear in the verb-particle construction, and may not be appropriate for Agentive *by* or instrumental *with*, for example).<sup>25</sup>

- (111) When a preposition appears with a complement, the following hold:

- a. The complement is interpreted as the Ground
- b. The PP formed has an open place corresponding to the Figure

This is reminiscent of the pattern of argument structure seen with verbs: if there is an Agent and a Theme, the complement is always the Theme, and the external argument is always the Agent. In fact, Agents are never complements, and it is possible that Themes, or at least Undergoers, are never base-generated as external arguments; see Grimshaw 1990 or Jackendoff 1990 for recent discussion. Verbs certainly have more flexibility in their argument structure than is suggested by (111); possibly, verbs can specify that their internal argument be the Figure and their external argument the Ground (for example, in *Sweaters collect lint*, or *The boy learned the lesson*; cf. Emonds 1991); other differences include the fact that verbs can denote events or actions (with Actors or Agents). But (111) can be assumed to hold at least of the spatial prepositions under consideration here.

When prepositions appear as modifiers or as predicates with the copula, it is always the Figure (the external argument) that is available, and the Ground (the internal argument) that is implicit or suppressed; *X is out* can't possibly mean that something else is not contained in X; nor can *X is on* mean that something is in contact with X and is either above it or smaller than it. The same is true of *up*, *down*, *away*, *off*, and the other prepositions that commonly occur without complements. Some examples are given in (112).

- (112) a. Morris is {in/out/around/away/back}  
       b. \* Morris' office is {in/out/around/away/back}

The examples in (112b) only make sense if the office is interpreted as the Figure; *Morris' office is in* cannot mean that someone is in the office, for example. Thus it appears that we can make the strong claim that a PP

<sup>25</sup> For the purposes of this discussion it makes no difference whether θ-roles are seen as primitive relations linked with argument positions by some sort of mapping rules (e.g. as in Grimshaw 1990), or are derived from general rules of lexical structure (e.g. as in Jackendoff 1990).

always has an open place corresponding to the Figure, whether the PP consists of a preposition plus its complement or simply of a particle; this is a stronger claim than that made in (111); (111) is accordingly revised in (113) below.

- (113) For all prepositional phrases PP headed by a preposition P,
- PP has an open place interpreted as the Figure
  - A complement of P (if there is one) is interpreted as the Ground

(113a) might actually follow from more general principles of theta assignment, if every predicate must have a Theme or Figure (e.g. as in Emonds' 1991:395 principle of FIGURE SPECIFICATION).

#### 4.2. Evidence for the ICP account

I am now in a position to make good on a promissory note issued in §3. Recall that the ICP (Invisible Category Principle) account predicted that if there was no postverbal DP, the particle would have to move (in order to get some lexical material into PredP), whereas the Case account predicted that if there was no postverbal DP, the particle should not move (since it moved only in order to become a Case-assigner for the DP). I claimed that the evidence favored the ICP account, but postponed discussion of that evidence because of the complexity of the argument. Part of the problem was that I had not yet introduced unaccusative verb-particle structures. The superficial similarity of the strings in (114) belies their different structures.

- (114) a. Friederich cleaned up.  
b. The milk dried up.

In (114a), there is an implicit argument; Friederich cleaned up some contextually determined area (or perhaps himself). In (114b), there is no implicit argument; *dry* is unaccusative, and *the milk* is the so-called postverbal DP; it has raised to subject position, leaving a trace in SpecPP and another in SpecPredP. Now let us consider what the two competing analyses, the ICP and the Case account, have to say about these two structures. On the Case account, the particle should not move in either case, since it does not need to become a Case-assigner in either structure. Thus the structures are as in (115).

- (115) a. Friederich cleaned [sc [PP up]]  
b. The milk<sub>i</sub> dried [sc t<sub>i</sub> [PP t<sub>i</sub> up]]

On the ICP account, the particle should move in (114a), in order to identify PredP, but should not move in (114b), since the trace of the subject DP in SpecPredP serves to identify PredP. The structures of the two examples are as in (116), on the ICP account.

- (116) a. Friederich cleaned [PredP up<sub>i</sub> [PP t<sub>i</sub> ]]  
b. The milk<sub>i</sub> dried [PredP t<sub>i</sub> [PP t<sub>i</sub> up]]

There is evidence that the structures in (116) are correct, and that the structure in (115a) is not a possible surface structure.

One possible diagnostic for movement of P<sup>0</sup> is whether P<sup>0</sup> can take a DP complement (the DP complement problem from §1 above). Recall that P<sup>0</sup> in situ can take a DP complement, or a PP complement with *of*, as in (117a-c), but that P<sup>0</sup> in Pred<sup>0</sup> cannot, as in (117d-f).

- (117) a. Jack bailed water out of the boat.  
b. Mikhail yelled his name out the window.  
c. Jill helped Jack out of trouble.  
d. \* Jack bailed out water of the boat.  
e. \* Mikhail yelled out his name the window.  
f. \* Jill helped out Jack of trouble

The examples in (118) are all of the unaccusative type, and DP and *of* complements to the particle are perfectly acceptable.

- (118) a. The blood drained out (of his veins).  
b. Edgar got out (of jail).  
c. The ball rolled down (the hill).  
d. The drunk fell off (the bench).

This suggests, given (117), that there is no particle raising in the complements of unaccusative verbs, consistent with the ICP account, assuming that DP trace in SpecPredP is sufficient to license PredP (cf. the structure in (116b)).

In (119) it is shown that those verb-particle constructions which allow implicit arguments do not allow DP complements to the particle.

- (119) a. Jill helped out (\*of trouble).  
b. Mikhail yelled out (\*the window)  
(good only as a prepositional verb, not with verb-particle stress)  
c. Jack bailed out (\*of the boat).  
(good only on another reading, where Jack jumped out of the boat)

Note that PP complements to particles are always licit following a particle in  $\text{Pred}^0$ , and similarly they are licit following a particle with an implicit argument.

- (120) a. He drove (the car) away from the scene of the accident.  
 b. He called (Raisa's name) out to the passing crowd.

I conclude from the data presented above that the contrasts predicted by the ICP account are real. This does not entail that a Case-chain is not formed from V to P in  $\text{Pred}$ . The ICP account makes no independent predictions about when or how Case is assigned to the postverbal DP; it simply provides an additional motivation for overt movement of some element into the layer of functional structure dominating PP, a motivation which is needed if we are to adopt a Minimalist account in which LF movement is generally sufficient to satisfy such conditions as the need of DP for Case, or the need of P to be checked against the l-selectional features of V.

The possibility of modifiers to  $P^0$  is another possible diagnostic for movement of  $P^0$ ; recall that modifiers cannot be moved along with  $P^0$  under head movement. In (121), some unaccusative structures with modified particles are shown.

- (121) a. The blood drained completely out.  
 b. The branch broke partway off.  
 c. Humpty Dumpty fell all the way down.

These are unaccusative structures; the Case account and the ICP account assign to them identical structures ((115b) and (116b)). Now consider the transitive structures in (122). (122a-b) show some structures in which a post-DP particle is modified, with reasonably acceptable results;<sup>26</sup> (122c-d) show that the same modifier cannot occur with the same particle if the DP subject is omitted.

- (122) a. ? Boris gave his political aspirations completely up.  
 b. ? Sonya towed herself briskly off.  
 c. \* Boris gave completely up.  
 d. \* Sonya towed briskly off.

<sup>26</sup> As above, the problem in finding better examples is that the verb-particle constructions which allow an implicit argument are restricted in number, and only a small fraction of particles in general have the right semantic content to allow modification.

Notice that these modifiers are licit following the particle, with or without the postverbal DP, as in (123).

- (123) a. Boris gave up (painting) completely.  
 b. Sonya towed off (Seymour) briskly.

Of course, in (123) the adjuncts may be VP-adjuncts; but at any rate the pattern is consistent with the prediction made by the ICP account that if there is no postverbal DP, then the particle must move to  $\text{Pred}^0$ .<sup>27</sup>

It seems, at any rate, that although our diagnostics are limited, there is evidence for the claim that when there is no postverbal DP, Prt must move into  $\text{Pred}^0$ , consistent with the ICP account. That this movement has the effect that  $P^0$  enters into a head-chain with  $V^0$  which combines their Case-assigning properties is not a problem for the ICP account, only for the Minimalist theory of Case. In other words, the Case-based account by itself cannot account for all of the environments in which movement of  $P^0$  necessarily occurs.

<sup>27</sup> The sentences in [i] are a problem. They are not perfect, but not as bad as my analysis would lead one to expect.

- [i] a. ? Boris gave right up.  
 b. ? Natasha threw right up.  
 c. ? Mikhail called right out.  
 d. ? Sonya towed right off.

If the particles in [i] have moved to  $\text{Pred}^0$ , then it must be possible for the modifier *right* to move along with the particle, something which seems to falsely predict the grammaticality of the structures in [ii].

- [ii] a. \* Boris gave right up the game.  
 b. \* Natasha threw right up her dinner.  
 c. \* Mikhail called right out Raisa's name.  
 d. \* Sonya towed right off the children.

One possibility is that the account I gave in §3 above for the ungrammaticality of examples like those in [ii] was incorrect (though it still holds for full phrasal modifiers like *completely* and *all the way*). Instead, it might be the case that *right* can move along with a particle, to  $\text{Pred}^0$ , but if it does, the particle cannot act as a Case assigner; it is embedded under two segments of  $P^0$  and cannot enter into a head-chain with  $V^0$ .

## 5. On the semantics of the construction

It is important to the analysis developed in this chapter that there exists a close relation between the verb and the particle, one which I have sometimes referred to as l-selection, a special case of c-selection. This relation is behind many of the patterns of data observed in §1, for example the possibility of particle-shift. In this section I discuss some of the semantic properties associated with the verb-particle construction, and motivate the claim that only in that construction does the verb l-select the predicative head of its complement.

Recall that I suggested in §3 above that the small clause complement to the verb in the verb-particle construction is a state of affairs; more specifically, we might call this particular kind of state of affairs a CHANGE OF STATE. A Change of state is an event in which an entity moves in space or acquires a property, essentially the same events which are described by Dowty (1979) as ACHIEVEMENTS (Dowty adopts this term from Vendler, who used it to classify verbs; as shown by Verkuyl 1972, whether a sentence describes an Achievement or not depends not only on the verb, but on other parts of the sentence such as the direct object). Following Dowty 1979, when something causes an Achievement, the larger event including the causation is described as an ACCOMPLISHMENT. The sentence in (124a) describes an Achievement (the stick acquires the property of being broken), and (124b) describes an Accomplishment (John causes the stick to acquire the property of being broken).

- (124) a. The stick broke.
- b. John broke the stick.

Similarly, the event described by the sentence in (125a) is an Achievement: the branch acquires the property of being broken off. (125b) describes an Accomplishment: Linda causes the branch to acquire the property of being broken off.<sup>28</sup>

<sup>28</sup> This abbreviated description does not entail that Linda broke something; cf. the classic discussions of the difference between *Jill caused the stick to fall (by frightening Ed, who was holding it)* and *Jill dropped the stick*, e.g. Fodor 1970, Shibatani 1976, McCawley 1978 (related concerns go back to Hume and Mill and beyond). A better paraphrase might be *Linda caused the branch to be broken off by means of breaking*; cf. §5.3.

- (125) a. The branch broke off.
- b. Linda broke the branch off.

As Bolinger (1971) points out, it is a characteristic property of the verb-particle construction that it describes a change of state.<sup>29</sup> Thus, verb-particle constructions do not in general occur with stative verbs such as *know*, *hope*, *resemble*, and so on; in a few cases they do, but then they take on a non-stative sense, as in (126).<sup>30</sup>

- (126) a. Hear me out.
- b. We looked the answer up.
- c. His friends saw the traveler off.

There are small clause constructions which do not have this sense of change of state. *Keep your hands up* has only a stative reading, 'cause your hands to remain held up'; but notice that it does not undergo particle-shift: \**Keep up your hands*. Similarly, *Hold your hands up* is ambiguous; but *Hold up your hands* has only a change of state reading. It cannot mean 'keep your hands up.' The same applies to *Hold your hands out*.

Åfarli (1985) notes that the same is true of Norwegian. He cites the following examples (from his p. 9; I retain his Nynorsk spelling).

- (127) a. Marit kjørte bilen varm.  
*Marit drove the.car warm*  
'Marit drove the car warm'
- b. Jon ønska Petter bort.  
*Jon wished Petter away*  
'Jon wished that Petter wasn't there'

(Nor)

<sup>29</sup> "In its core meaning (though not necessarily in the figurative extensions discussed in Chapters 9 and 10) the particle must contain two features, one of motion-through-location, the other of terminus or result" (Bolinger 1971:85). I believe that even the "figurative extensions" of verb-particle combinations can be classified as describing changes of state, but that the resultant state (or location) is determined not by the particle alone, but by the combination of the verb and the particle.

<sup>30</sup> There is a small number of verb-particle constructions where the result-state might be interpreted as having a stative sense, with the meaning 'cause X to stay in state/location': for example in *{lock/keep/hold} the dog out*, the dog doesn't go out but stays out; similarly for *keep your head {up/down/out/in}*. But in each case the construction as a whole is interpreted dynamically, not statively; the change of state interpretation holds if the verb and the particle are together taken to determine the state: 'the dog becomes {locked-out/kept-out/held-out}'.

Åfarli notes that the most natural interpretations of (127a) have the predicate as a depictive adjunct, meaning either that Marit was warm when she drove the car or that the car was warm when Marit drove it (exactly as with the English translation, context can make one reading or the other salient); in addition, these sentences have a possible resultative reading, though (127b) only makes sense on that reading if Jon is some sort of wizard. (127b) involves a want-type small clause; as with (127a), there is no sense of causation. Now, Åfarli notes that if particle shift is forced on these structures, the only possible interpretations are resultative.

- (128) a. Marit kjørte varm bilen. (Nor)  
*Marit drove warm the.car*  
 'Marit drove the car warm' (resultative interpretation only)
- b. Jon ønska bort Petter.  
*Jon wished away Petter*  
 'Jon wished Petter away' (resultative interpretation only)

The question is why the construction should have these particular properties, given that it is easy to imagine a language very much like English or Norwegian but in which non-resultative constructions undergo particle shift. I will address this question in the following three subsections.

### 5.1. Result states

Notice that the particles themselves can denote states; in the sentences in (129), the particles are used as predicates, and the subjects are asserted to have the state denoted by the predicate.

- (129) a. The power is off.  
 b. The lights are on.  
 c. The temperature is up.  
 d. The Dow is down.  
 e. Big shoes are in.  
 f. The doctor is out.

The state use of the particles is retained in the bracketed small clauses in (130); there is no change of state asserted or implied; for example, (130a) could be used even if the car was manufactured with the hood up. Similar (unlikely) contexts can be constructed for each of the other examples, showing that any indication that a change of state has occurred is purely pragmatic and cancellable.

- (130) a. We drove with [the hood up].  
 b. With [the lights out], we'll have to read by candlelight.  
 c. The fans considered [the runner out].  
 d. I know they're home — I saw [the lights on].  
 e. I like [the TV off] when I read.

Thus the notion of a change of state is not something contributed by the particle, not even when it appears in a small clause in general. Instead, it is a constraint on the construction;<sup>31</sup> the verb-particle construction is a construction in which a verb c-selects a state of affairs-denoting small clause and l-selects a (particular) particle; the fact that this state of affairs-denoting small clause must denote a change of state (unlike the case with the want-type verbs discussed in Chapter 2) follows from other factors (discussed immediately below). It has been observed that there are non-causative combinations of a small clause-taking verb and a prepositional small clause predicate, such as the examples in (130c-e). However, notice that in no such case is the combination of the verb and the particle idiosyncratic; if the fans can consider the runner out, then they can think him out, believe him out, regard him as out, or prove him out. Clearly, there are restrictions on l-selection. I propose that although particles denoting result states can be l-selected, lexical heads denoting propositional predicates and perceived states or activities cannot. This presumably has something to do with lexical semantics; the item l-selected must denote something which can be specified in a verb's lexical semantics; result states clearly can, but perceived states cannot (cf. Jackendoff 1990, Levin & Rappaport Hovav 1991, Choi & Bowerman 1991, Gropen et al. 1991 for some recent discussion of constraints on the content of lexical entries).

### 5.2. Causation

Another observation that may be made about the verb-particle construction is that when it has an external argument, the external argument is always seen as the cause of the Change of state; that is, there are no verb particle combinations like 'see out' or 'like in,' as in (131).

<sup>31</sup> This sort of connection between a construction and an interpretation or a restriction on meaning made explicit in CONSTRUCTION GRAMMAR; see Goldberg 1991 for an account of resultatives and related constructions using concepts developed in construction grammar.

- (131) a. \* The fans saw out the runner.  
 b. \* I like in the money.

The intended meanings here would be 'The fans saw the runner become out' and 'I like the money to come in'; both involve a change of state, but both are bad. Compare the valid use of *see out*, which means something like 'to accompany [a guest] to the door.' Must we posit a restriction on verb-particle constructions that their external argument (if they have one) must be a Causer (or Actor or Agent)? I believe not. There are some general restrictions on the kinds of arguments that a verb may have; for example, there are a great number of verbs denoting changes of state (e.g. *go, mix, clear, break, freeze*), and many of them have optional causer subjects (the 'causative-inchoative' alternation); but (as far as I know) no change of state verb which indicates a resultant state in its lexical composition takes a non-causer subject. For example, consider the psychological predicates: they have long been noted to group into two general classes, the stative class with Experiencer subjects and Theme objects (e.g. *like, love, hate*) and the other class with Causer subjects and Experiencer objects (e.g. *please, delight, satisfy*); see Pesetsky 1992 for arguments that the former class is always stative and the latter class always causal. Now, consider that *please, delight, and satisfy* all specify resultant states: the states of being pleased, delighted, and satisfied, respectively. The verbs *like, love, and hate*, on the other hand, do not specify resultant states; they are more easily characterized as relations (for example, if you hate something, it may make you angry, or it might make you depressed; but if something delights you, it necessarily makes you delighted). Without attempting to delve further into restrictions on possible verb meanings, let me simply suggest that the restriction of the external argument of the verb-particle construction to the role of Causer is the product of a more general restriction: a verb which specifies a result state (as all verb-particle constructions do, by means of l-selecting the head of the predicate of their state of affairs complement) can only have a Causer external argument (cf. Ritter & Rosen 1993 on causation as determined by clause structure; or Choi & Bowerman 1991, who show that in Korean, transitive verbs indicating caused motion generally express Path of motion in their lexical conceptual structure, while intransitive verbs expressing spontaneous motion must express Path separately).

### 5.3. Lexical Subordination

It is possible to characterize the meaning of the resultative construction (see e.g. Jackendoff 1990) as follows: a resultative construction of the form 'X V Y P,' where X is a DP (an Actor), V an activity verb, Y a DP

(an Undergoer), and P a predicate (a state or location), has the interpretation 'X causes Y to go to/become P by means of V'; e.g. *The crowd booed the actor off the stage* means 'the crowd caused the actor to go off the stage by means of booing'; and *Sid painted the house orange* means 'Sid caused the house to become orange by means of painting.' As Levin & Rapoport 1988 point out, the activity described by the main verb becomes subordinate to the the primitive predicate CAUSE (they call this LEXICAL SUBORDINATION). The meaning of the main verb shows up in what looks like a manner or means adjunct (Jackendoff's 1990 SUPERORDINATE ADJUNCT).

The verb-particle construction has a very similar interpretation, with one crucial difference: the state attained by the Undergoer is not completely described by the particle alone, but is determined by the particle and verb in combination. *Alice looked the information up* means 'Alice caused the information to become looked up,' and *Edgar cut the vegetables up* means 'Edgar caused the vegetables to become cut up,' where *cut up* is a telic version of passive *cut*. The superordinate adjunct is (at least in some cases) still necessary; *Moira turned off the TV* does not appropriately describe a situation in which Moira caused the TV to be off by pulling the plug; it means that she turned a knob or pressed a button, i.e. 'Moira caused the TV to become turned off by means of "turning"' (where "turning" has an extended sense), where the means adjunct modifies the clause headed by CAUSE, of which Moira is the subject (if it modified the embedded clause, it would not entail that Moira did the turning).<sup>32</sup>

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<sup>32</sup> This brings us to a point where it is possible to speculate more vividly about the nature of the relation between the verb and the particle. Following up on the observation from the lexical semantics literature that inchoative verbs generally specify either manner of movement (e.g. *roll, slide*) or result state (e.g. *break, melt*), we could assume that there is a lexical restriction on predicate meaning that only manner or result can be specified on a single head, but not both. The verb-particle construction can be seen as a language-specific device for expressing both manner and result in the same clause, without using an adjunct phrase; since there are two lexical heads, both pieces of information can be supplied (this could be represented by allowing two θ-roles to be assigned to the single argument of the preposition, perhaps by allowing the ability to assign a θ-role to be a feature which can be passed down to the particle via a head-chain). In many cases, the combination is so thoroughly lexicalized that neither manner nor result can uniquely be associated with one lexical head.

#### 5.4. The interpretation of the particle

I have extensively used l-selection of the embedded predicate by the verb to account for various aspects of the verb-particle construction. L-selection is clearly motivated when a verb-particle combination is idiomatically interpreted, as those in (132) are; but is it also motivated for more compositionally interpreted combinations, such as those in (133)?

- (132) a. The distraction threw the pilot's timing off.
- b. We cashed all our traveler's checks in.
- c. They eked out a spartan existence.
- d. The announcement broke the meeting up.

- (133) a. We dried the dishes off.
- b. They dented the fender in.
- c. These sunglasses screen UV rays out.
- d. The announcement drove stocks up.

In order to answer this question, I will first briefly discuss the range of interpretations of the particle.

The various particles have taken on different special extended meanings in English. Thus, the particle *out* can mean 'unconscious', of a person, as in (134a), or 'to unspecified human recipients', as in (134b-c).

- (134) a. Tyrone {blacked/conked/was knocked/passed} out
- b. The Salvation Army {dishes/doles/ladles/gives/hands} food out.
- c. The company {lends/rents/hires/charters} planes out.

*Out* also takes on meanings in the verb-particle construction that are not easily paraphraseable without referring to the whole construction. For example, there are several verbs which, when in combination with *out*, mean 'insult' or 'chastize', as in (135a). In (135b), several verb-particle combinations are shown which act as psychological predicates.

- (135) a. The goalie {bawled/chewed/cursed} the referee out.
- b. The forward {psyched/faked/freaked} the goalie out.

Such examples are most easily described not by establishing separate idiosyncratic meanings for these uses of *out*, but by allowing *fake out* to mean 'fool', etc. This is even more apparent in the case of examples like those in (136), which depict events of creation or of revealing things to someone's perception, and those in (137), which depict events of destruction or of concealing things from perception.

- (136) a. They {carried/mapped/laid/worked/hatched/figured} out a plan.
- b. We {read/printed/sang/called/scratched/acted/carved} out the numbers.
- c. I {counted/measured/dealt/laid} out the beans.

- (137) a. They {hammered/ironed/rolled/cut/rubbed} out the bumps.
- b. We {drowned/blackened/inked/scribbled/scratched} out his answer.

A couple of minimal pairs are given in (138).

- (138) a. The two sides hammered out a truce. (created)
- b. The two sides hammered out their differences. (destroyed)
- c. We scratched out a symbol on the rock. (created)
- d. We scratched out the symbol on the rock. (destroyed)

It seems that *out* has taken an extended sense on the model of such examples as *pull a rabbit out (of a hole)*, where the rabbit comes into view, so that combinations with *out* can mean something like 'create' or 'provide'; and it has in addition taken an extended sense on the model of such examples as *chase the fox out (of the chicken coop)*, where the fox disappears from view, so that combinations with *out* can mean something like 'eliminate' or 'dispose of.' In English, this has become quite regular, so for example any verb of removal (in the sense of Levin & Rappaport Hovav 1991) which is perceived as affecting a location (the Ground) by the removal of some substance or objects (the Figure) can appear as a verb-particle combination with *off*, in the frames [V Ground off] or [V Figure off (Ground)]; for example *dry, clean, clear, wipe, scrub, buff, scrape, chisel, sand*, etc. This is quite productive; for example, if I choose to use *squeegie* as a verb, then if I can say (139a), I can say (139b-f).

- (139) a. Hey, Kid — squeegie my windshield.
- b. Hey, Kid — squeegie my windshield off.
- c. Hey, Kid — squeegie off my windshield.
- d. Hey, Kid — squeegie those bugs off my windshield.
- e. Hey, Kid — squeegie those bugs off.
- f. Hey, Kid — squeegie off those bugs.

Similar facts apply to *out*; verbs like *mop, sweep, rub, brush, or clear*, when understood as affecting a location by the removal of something, can be used with *out* in the same two patterns. For some reason, *in* and *on* are not so productive: \**spray the wall on* is quite impossible, though it fits

the frame [V Ground on], and the Ground is certainly affected by the activity, if for example the Figure is paint. This may indicate that sentences like those in (139) are made possible by lexical rules which specifically apply to *out* and *off*. This is consistent with the position taken here that the verb-particle construction requires the particle to be specified in the lexical entry for the verb.

Another productive construction involves aspectual *up*. *Up* can be added to an achievement or accomplishment construction to indicate a degree of thoroughness, or completeness. If you tear a piece of paper, it may just have a small rip in it; but if you tear it up, it must end up in small pieces.

My answer, then, to the question of whether it makes sense to say that even compositional verb-particle constructions involve I-selection is yes, they do, but in some cases that I-selection is derived (in the lexicon) by a productive lexical rule.

## Extraduction

In this dissertation, I have attempted to provide a workable analysis of a particular body of data. I have used the analytic tools developed in GB theory as a starting point, and have made some proposals and revisions regarding some of those tools. Here I will briefly summarize what I take to be the main points of the dissertation.

Chapter 1 is properly divided into three sections. Section 1 is a discussion of the notion of predication, with a focus on previous works on the topic. Drawing on these works, I adopt a notion of predication that is used elsewhere in the dissertation, specifically one which marries the syntactic structure-bound conception of GB work to the semantic considerations of the philosophers. Specifically, I adopt a notion of predication as mediated by a predicator, following Bealer, Chierchia, and others, and assume that this predicator has a syntactic status as a functional head, following Bowers.

The next section of Chapter 1 deals with the relations between a head and its complement. I discuss the history of the idea of c-selection, and provide a formal characterization of it and some other head-complement relations, cast in terms of head chains, based on work by den Besten and Sigurðsson. I argue that there are many morphosyntactic features whose values can be specified on a complement by a head, feature specifications which cannot be so influenced on subjects and adjuncts. The mechanism of head-chains captures this relation nicely, either defined using government as in den Besten and Sigurðsson, or defined in terms of locality, as here (in order to avoid the various ancillary assumptions that the notion of government carries with it).

In the third section of Chapter 1, I developed a notion of dependency. This notion makes crucial reference to the semantic interpretation of a node; if the node can be translated by the mapping rules for semantic interpretation as something of type e (in the extended sense of Chierchia & Turner 1988), then denotes an entity and can have properties predicated of it (it can be a subject), and it can bind variables (it can be displaced). Thus anaphoric variables which get bound by syntactic constituents are restricted to type e, in a way reminiscent of the restriction in first-order logic to functions over individuals. Constituents which do not translate as basic types are dependent; they cannot be coindexed with an anaphoric variable and therefore cannot be displaced.

In Chapters 2 and 3, I apply the concepts of predication, head-chains, and dependency from Chapter 1 to some data drawn from English and the Scandinavian languages. Chapter 2 treats a set of contrasts between epistemic verbs like *believe* and emotive or desiderative verbs

like *want* and *hate*. It is proposed that the denotation of the complement of an epistemic verb is a proposition, which is anchored to some set of possible worlds, in the sense of Farkas 1992b. This anchoring is provided by the epistemic verb, and mediated by the complementizer. The operator which must be anchored is located in Infl. In a small clause, there is no Infl, hence no modal operator; this makes it impossible for a small clause by itself to denote a proposition. However, a head-chain of the sort defined in Chapter 1 may be formed between the epistemic verb and the embedded Pred (the predicate in the small clause, as determined in Chapter 1), and the feature values for the modal operator may be copied onto the lower Pred. This allows a small clause to denote a proposition, when embedded under a verb such as *consider*.

Other small clauses denote states of affairs, in approximately the sense of Barwise & Perry 1983. States of affairs do not need to be modally anchored, and are not dependent on a higher head. In Chapter 2 I also explore the possibility that there are two kinds of Pred, corresponding to the two types of Infl proposed by Diesing 1992. I suggest various distinctions between the two predicates, one of which is ultimately associated with propositional interpretations, and the other of which is associated with descriptions of states of affairs.

In Chapter 3, I take up the verb-particle construction. The verb-particle construction is analyzed as involving a small clause, following Bolinger and Kayne; particle shift is analyzed as involving P movement to Pred, across SpecPP, where the postverbal DP resides. The movement of P to Pred is necessitated by the fact that V 1-selects P, a relation which requires sisterhood (at LF). Once P has moved, a head-chain can be formed between V and P, and P can assign Case to the postverbal DP. Various other features of the verb-particle construction are also explored.

The success of the analyses in Chapters 2 and 3 in accounting for the patterns of data provides indirect support for the notions of predication, c-selection, head-chains, and dependency developed in Chapter 1. It is to be hoped that these proposals will find credence elsewhere, in the analysis of other constructions and in other languages.

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