THE PHRASE STRUCTURE OF NON-PROJECTING WORDS

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Abstract

Linguists often encounter elements that are neither bound morphemes, nor full phrasal constituents. These elements are problematic for three reasons: first, they are difficult to categorize structurally; second, they do not form a uniform class; and third, they do not do not fit neatly into most theories of phrase structure. This dissertation focusses on Swedish verbal particles, which form a particular group of such elements. Swedish particles are exemplified by *upp* 'up' and *bort* 'away'.

I argue that the verbal particles in Swedish are syntactically independent words which do not project phrases. Particles then differ syntactically from other constituents and are therefore governed by different distributional constraints. Specifically, I argue, particles must adjoin to V^0. This explains the otherwise mysterious word order facts: verbal particles immediately follow the verbal position within the VP. The analysis advocated in this work also explains the fact that particles cannot take complements and modifiers. Since particles do not project phrasal levels, there is nowhere for other phrases to attach.

Particles are distinguished from other words *solely* by their phrase structure realization. In other respects, they may be semantically and functionally identical to fully projecting words. Phrase structure must thus be independent of other syntactic information and also of semantic information, as is generally assumed in the formal framework of Lexical-Functional Grammar (LFG). In LFG, the level of constituency and word order (constituent structure) is separated from other levels of linguistic representation, such as functional structure, argument structure, semantic structure, etc. Importantly, predicate-argument relations are not directly tied to the c-structural representation of a clause, and this is crucial for the analysis of Swedish particles, since particles can

correspond to more than one syntactic function.

C-structure in LFG is governed by X′-theory, which states that every word is embedded in (at least) three levels of syntactic structure: a lexical level (X^0), an intermediate level (X′) and a phrasal level (XP or X″). However, researchers often posit structures which violate X′-theory when trying to represent small words ('clitics'), which are similar to Swedish verbal particles, which, I argue, do not project beyond the pre-terminal (X^0) level. We therefore cannot accept X′-theory as it stands, and I modify the X'-theory of LFG in order to make it possible to accomodate non-projecting words in our structural representations.

The syntactic representation of verbal particles that I propose is very simple, but this does not mean that their semantic representation is equally straightforward. In fact, I show that particles divide into three groups semantically: they are resultative predicates, aspect markers, or part of verb-particle idioms. However, the structure of particles is the same regardless of their semantic function: no matter what their meaning is, particles are non-projecting words, adjoined to V^0.

In every Germanic language, we find a group of words that are clearly related to the Swedish verbal particles. However, although these words are related, their characteristics are not identical with those of Swedish particles. There are some well-known differences with respect to the word order, for example: in Danish, particles follow the direct object; in English, particles appear on either side of the object; and in Swedish, particles necessarily precede the direct object. I examine German, Danish, and English particles and show that the c-structure realization of verbal particles in each language is different. German is like Swedish, in that particles are head-adjoined to V^0. In Danish, there are no non-projecting verbal particles; the words that correspond to Swedish particles necessarily project full phrases. English has morphologically incorporated 'particles', in addition to fully projecting prepositions. Although these words are similar across languages with respect to their syntactic and semantic function, they differ in c-structural realization. The LFG model of parallel but distinct levels of structure provides the tools necessary to capture both the similarities and differences between the Germanic languages.

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Contents

Chapter 1

Introduction

The goal of this dissertation is to explore independent syntactic words which do not project full phrases. The main focus will be on Swedish verbal particles such as *upp* 'up', *bort* 'away' and *ut* 'out' in Swedish, exemplified in (1.1). Throughout this thesis, the particles will be boldfaced when they appear in example sentences:

(1.1) (a) *Pia sparkade* **upp** *bollen.*
P. kicked up ball.the
'Pia kicked up the ball.'

(b) *Ella lade* **bort** *vantarna.*
E. laid away mittens.the
'Ella put the mittens away.'

(c) *Sanna kastade* **ut** *alla böckerna.*
S. threw out all books.the
'Sanna threw all the books out.'

The Swedish verbal particles form a group of their own and are traditionally recognized by the criteria in (1.2) (Teleman et al. 1999, Volume 3: 417-435, Platzack 1998, Haider 1997, Norén 1996, Svenonius 1994, Ralph 1987, Taraldsen 1983, Hellberg 1976, Kjellman 1929):

(1.2) (i) A particle is stressed.

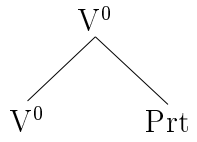
(ii) A particle immediately follows the verbal position within the VP.

(iii) A particle cannot have a modifier or a complement.

Criterion (i) distinguishes particles from prepositions, criterion (ii) distinguishes particles from adverbs and obliques, and criterion (iii) distinguishes particles from other words (like normal verbs, nouns, etc.), as will be discussed below in chapters 2 and 5. By these criteria, it is clear which elements belong to the group of particles and which do not, and the question is now: *What is the formal difference between particles and other words?*

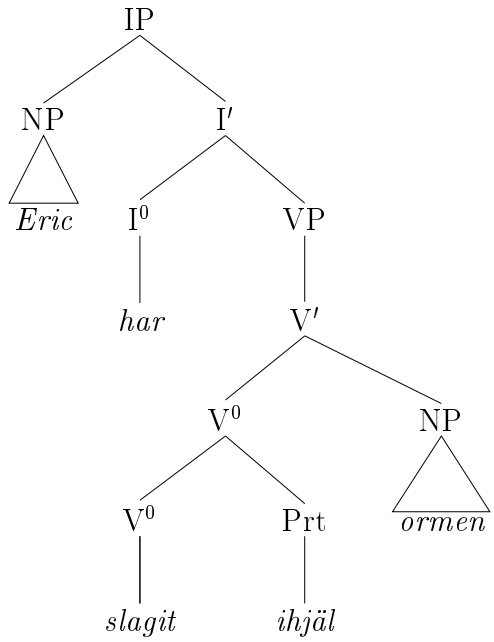
I will argue that what distinguishes particles from other words is their phrase structural realization. More specifically, I will argue that particles are non-projecting words, adjoined to V^0:

(1.3)



An example is given in (1.4):

(1.4)

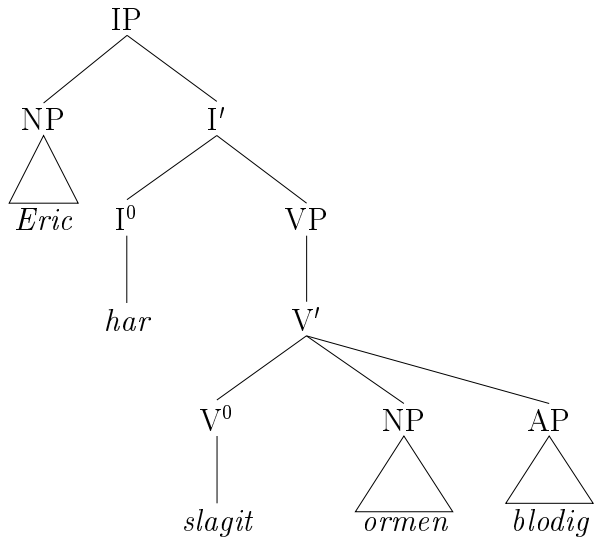


Eric	*har*	*slagit*	*ihjäl*	*ormen.*
E.	has	beaten	to.death	snake.the

'Eric has beaten the snake to death.'

The word *ihjäl* in (1.4) is a verbal particle. The structure in (1.4) can be compared to (1.5), which does not contain a verbal particle:

(1.5)



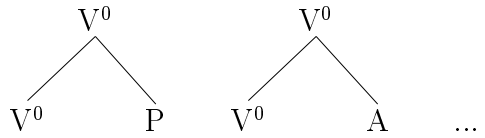
Eric	*har*	*slagit*	*ormen*	*blodig.*
E.	has	beaten	snake.the	bloody

'Eric has beaten the snake bloody'

The two sentences in (1.4-1.5) are very similar, as they only differ in the choice of one lexical item: *ihjäl* in (1.4) is replaced by *blodig* in (1.5). Since *ihjäl* is a particle and *blodig* is not, we see a difference in word order: particles are head-adjoined and must therefore appear in the 'particle position' immediately adjacent to the verbal position within the VP.

I will show that the phrase structural realization in (1.3) is the defining characteristic of particles. Importantly, Swedish particles do not form their own *word class* (i.e. syntactic category, such as nouns or verbs). Instead, words from different syntactic categories can appear in the particle position adjoined to V^0, as illustrated in (1.6). Throughout this work, I will adopt the following notation: a non-projecting word is a plain X (e.g., P) and a projecting word is an X^0 (e.g., P^0):

(1.6)



So, particles are not connected to a specific word class. They are also not associated with any one grammatical function: they can be resultative predicates or aspect markers. I

will argue that the only characteristic that unifies the particles and distinguishes them from other words is their phrase structural realization.

1.1 Particles and X′-theory

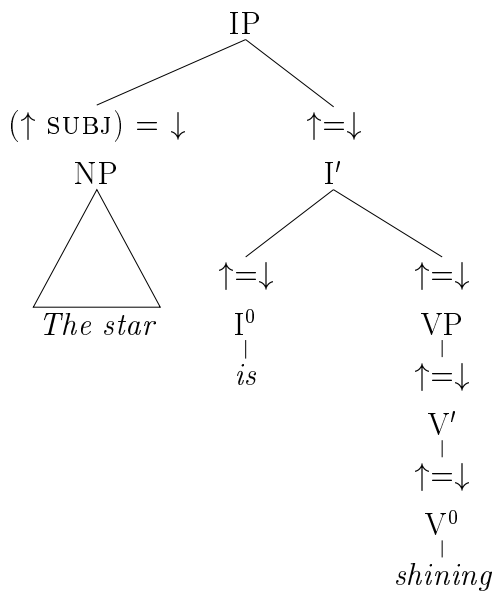
My analysis will be cast within the formal framework of Lexical-Functional Grammar (LFG) (Dalrymple et al. 1995, Bresnan 1982b, 2001, Kaplan and Bresnan 1982). The architecture of LFG includes several distinct but interrelated levels of grammatical information, among those c(onstituent)-structure, f(unctional)-structure, and a(rgument)-structure:[1]

[1] (1.7) is meant as an illustration of the kind of information that is represented at the different syntactic levels. It is not intended as a complete characterization of the sentence *The star is shining*. For example, the characterization of aspect is more complex than what is shown here. Aspect will be discussed in section 6.2.

A note on the notation: ↑ ('uparrow') refers to the immediately dominating node, and ↓ ('downarrow') refers to the node itself. The notation (↑ SUBJ) = ↓ on the NP node thus says that the NP is the subject of the IP. The notation ↑=↓ has the effect that the node's information maps into the same f-structure as the information contributed by the mother node.

(1.7) THE LFG ARCHITECTURE

c-structure:



lexicon:

star, N:	(↑ PRED)	=	'star'
	(↑ NUM)	=	SG
the, D:	(↑ DEF)	=	+
is, I:	(↑ TENSE)	=	PRESENT
	(↑ SUBJ NUM)	=	SG
	(↑ SUBJ PERS)	=	3
shining, V:	(↑ PRED)	=	'shine <(SUBJ)>'
	(↑ ASPECT)	=	DURATIVE

f-structure:

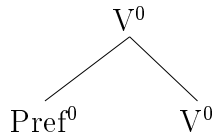
$$\begin{bmatrix} \text{PRED} & \text{`shine}\left\langle\left(\text{SUBJ}\right)\right\rangle\text{'} \\ \text{TENSE} & \text{PRESENT} \\ \text{ASPECT} & \text{DURATIVE} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{`star'} \\ \text{NUM} & \text{SG} \\ \text{PERS} & 3 \\ \text{DEF} & + \end{bmatrix} \end{bmatrix}$$

C-structure models the surface phrase structure and concerns word order and dominance; f-structure represents grammatical functions, such as SUBJ(ECT) and OBJ(ECT); and a-structure concerns thematic roles, such as agent and theme. The levels are interrelated through mapping principles. The LFG framework is ideal to model an analysis such as the one I will argue is correct for particles: particles differ from other elements in the c-structure, and in the c-structure only.

My proposal for the syntactic realizadion of particles is at odds with traditional X′-theory, which assumes that every word heads a phrasal projection of the same category. However, although non-projecting structures are disfavored by X′-theory, they are often assumed across theoretical frameworks and theories. Let me briefly review different contexts in which non-projecting words are typically appealed to in the literature. We will see that only one is relevant for LFG's X′-theory.

Morphological constructs are often modelled as subsyntactic tree structures, involving head-adjoined non-projecting words. For example, Zeller (1999) adopts the structure in (1.8) for German prefix verbs:[2]

(1.8)



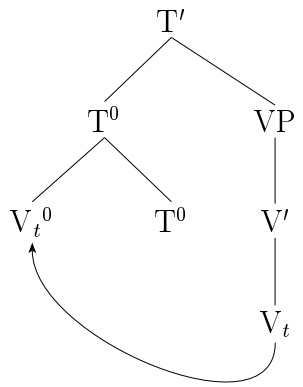
An example of a German prefix verb is given in (7.15) in chapter 7. The structure in (1.8) represents the internal morphological structure of a word. In LFG, the formation

[2]Zeller (along with many others) distinguishes between German prefix verbs and particle verbs. He does not assume that the particle verbs have the structure in (1.8).

of words is assumed to take place in the lexicon, which is not governed by X′-theory, so morphological head-adjoined structures such as that in (1.8) are handled differently and not of concern here.[3]

Non-projecting structures in the syntax are often posited as head-adjunction resulting from *head-movement*. LFG does not adopt the mechanism of movement, but I mention it here since it is a common source of head-adjunction encountered in the literature.[4] An example adapted from Radford (1997, p. 245) is given in (1.9):

(1.9)



Although V^0 does not project in its surface position, it projects in its base position. Since the verbal head does project a phrase at one point in the derivation, it does not violate X′-theory.

We can disregard morphology and movement structures, but base-generated non-projecting structures pose a real problem for the LFG X′-theory. Such structures have previously been proposed in theories other than LFG by Jaeggli (1986), Pulleyblank (1986), Poser (1992), Piñon (1992), Keyser and Roeper (1992), and others. Within LFG, non-projecting structures are posited by Zaenen (1983), Sadler and Arnold (1994), Sadler (1998a,b), and Sells (1994, 2001).[5] Swedish particles also provide evidence for

[3]The Swedish verb-particle combinations are clearly not morphological constructs, as will be shown in section 2.3.

[4]Movement analyses of the verb-particle constructions will be discussed in various places below (see section 2.2, for example).

[5]Zaenen (1983) call such structures 'minor categories', and specifically assumes that functional categories, such as determiners and complementizers, belong in this group. Sadler and Arnold (1994) propose a non-projecting structure for English adjectives and adverbs. Sadler (1998a,b) posits a similar analysis of Welsh possessive determiners. Finally, Sells (2001) proposes non-projecting structures to account for object-shifted pronominals in Swedish.

base-generated, non-projecting words, even though X′-theory does not allow them. Although previous researchers have made reference to non-projecting words, I am not aware of any explicit discussion of how such structures can be reconciled with X′-theory. One of my goals here is to modify X′-theory so that it accomodates non-projecting words, and also restricts their distribution.

1.2 Swedish clause structure

This section briefly sketches the phrase structure of Swedish. Swedish is a verb-second (V2) language, and the finite verb in the main clause is preceded by exactly one phrase. In (1.10a), the subject precedes the verb, but the initial element can be a topicalized phrase of any function, as in (1.10b-d):[6]

(1.10) (a) *Pojken läste boken.*
boy.the read book.the
'The boy read the book.'

(b) *Boken läste han inte.*
book.the read he not
'The book, he didn't read.'

(c) *[Ett muntligt prov] klarade hon lysande.*
an oral exam passed she brilliantly
'An oral exam she passed easily.' (PAR)

(d) *[Genom den öppna dörren] såg hon Anders och Hammou*
through the open door.the saw she A. and H.
fördjupade i spelet.
engaged in game.the
'Through the open door she saw Anders and Hammou deeply engaged in the game.' (PAR)

Finite verbs in main clauses appear in a functional projection outside the VP:

[6]Most of the examples used in this work are taken from the Swedish PAROLE corpus, which is available on the web at *spraakdata.gu.se/lb/parole* and *www.lexlogik.se/Demonstrations/svecorpus.htm*. The corpus examples are marked with (PAR) in this text.

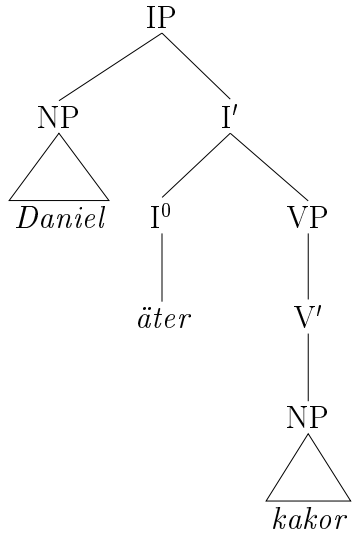
(1.11) (a) *Daniel äter inte [$_{VP}$ kakor].*
D. eats not cookies
'Daniel doesn't eat cookies.'

(b) *Sofia kastar ofta [$_{VP}$* **bort** *saker].*
S. throws often away things
'Sofia often throw things away.'

Negation words (such as *inte* in (1.11a)) and certain adverbs (such as *ofta* in (1.11b)) mark the left edge of the VP in Swedish (Holmberg (1986), Holmberg and Platzack (1995), Platzack (1998)).[7] Since the verb is to the left of these adverbs, it must be situated somehere outside the VP.

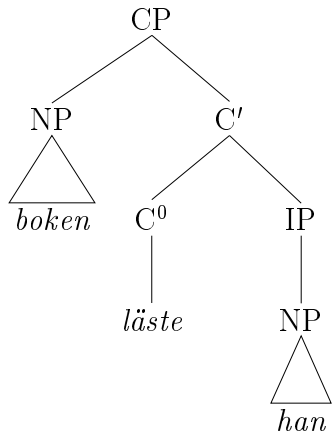
When the initial element is not a subject (as in (1.10)), the verb is assumed to be in C^0. However, the position of the verb in subject-intitial clauses is controversial. Holmberg (1986), Holmberg and Platzack (1995), Vikner (1995) and others assume that the verb is always in C^0, whereas Travis (1991), Zwart (1997), Sells (2001) argue that the verb is in I^0 when a subject precedes it, otherwise it is in C^0 (for a comparison of the two approaches, see Sells (2001)). I will assume the latter analysis, and the structure for (1.11a) is thus (1.12) and the structure for (1.10a) is (1.13) (I am excluding the negation, as I don't wish to take a stand on its phrase-structure realization here):

(1.12)



[7] Whether the negation is within the VP or outside the VP is controversial. See the discussion of Sells (2000), who assumes that the negation is outside the VP, but reviews the arguments for both views.

(1.13)



Even though I assume that subject-initial V2 clauses are IPs and non-subject-initial V2 clauses are CPs, nothing hinges upon this choice: my treatment of the verbal particles is equally compatible with both analyses.

Finite verbs in subordinate clauses and non-finite verbs are situated within the VP. This is illustrated by (1.14), where the negation precedes the verb:

(1.14) (a) *Oskar sa att han inte* [$_{VP}$ *äter kakor*].
O. said that he not eats cookies
'Oskar said that he doesn't eat cookies.'

(b) *Oskar vill inte* [$_{VP}$ *äta kakor*].
O. wants not eat cookies
'Oskar does not want to eat cookies.'

For further data and general discussion of Swedish phrase structure, see Holmberg (1986), Holmberg and Platzack (1995), Platzack (1998), Teleman et al. (1999), Sells (2001) and references cited in those works.

For present purposes, it is important to note that no matter where the verb is situated, the particle will always appear within the VP:

(1.15) (a) *Jan åt inte* [**upp** *kakorna*].
J. ate not up cookies.the
'Jan did not eat up the cookies.'

(b) *Jan vill inte* [*äta* **upp** *kakorna*].
J. wants not eat up cookies.the
'Jan does not want to eat up the cookies.'

(c) *Jan sa att han inte* [*åt* **upp** *kakorna*].
J. said that he not ate up cookies.the
'Jan said that he didn't eat up the cookies.'

When the verb is in I^0 or C^0, the particle is the first element within the VP, as in (1.15a). When the verb is in V^0, the particle immediately follows it, as in (1.15b–c). This indicates that the particle is always attached to V^0, as in (1.3) and (1.4).

1.3 Overview

This work is organized as follows:

Chapter 2 motivates the analysis for Swedish particles sketched above. I will specifically point out the problems that arise if particles are analyzed as full phrases. Chapter 2 also provides evidence that verbs and particles are combined in the syntax and not in the lexicon.

Chapter 3 shows that Swedish particles cannot be analyzed as clitics, at least not if we follow the standard clitichood definitions. I then go on to argue that the notion of non-projecting words argued for in this work is useful in classifying different types of 'clitic-like' elements; that is, the vast range of elements which have previously been referred to as clitics in the literature.

In chapter 4, I discuss and revise the LFG X′-theory of Bresnan (2001). The new version of X′-theory is more explicit and more restrictive. It crucially constrains the occurrence of non-projecting words by postulating that they must be head-adjoined.

Chapter 5 shows how the theory outlined in chapter 4 can be applied to Swedish, focussing mainly on VP-internal syntax. The machinery that was developed in chapters 2-4 is all we need in order to account for the syntax of verbal particles in Swedish. I also show that Swedish provides empirical evidence for the LFG Economy principle, which has previously been argued for solely on theoretical grounds.

Chapter 6 discusses the semantics of verb-particle combinations. I propose that verb-particle combinations in Swedish divide into three main groups: aspect markers, resultative predicates, and parts of verb-particle idioms. The fact that the particles can have different semantic functions, however, does not affect their syntactic realization:

no matter what their semantics is, their syntax remains the same.

Finally, chapter 7 discusses verbal particles in some of the other Germanic languages, specifically Danish, German and English. Danish and German are straightforwardly analyzed within the assumptions laid out here. However, English proves to be more complicated, because of the syntactic optionality we find in English verb-particle constructions. I will adopt an anlysis where the English pre-object particle is lexically adjoined to the verb. Chapter 7 also provides a discussion of the complex particle construction in English, exemplified by *bring him up a drink*. This construction poses an interesting problem for the present analysis, as an apparent non-projecting word is separated from the verb by the first object. I will introduce some new data which suggest that the complex particle construction is a type of constructional idiom.

Chapter 2

Empirical motivation

A verbal particle in Swedish consists of a single word. In other words, a full phrase (including a modifier and/or a complement) can never appear in the particle position. This basic fact motivates the main proposal of this chapter, which is that particles are non-projecting words. This chapter also discusses and rejects two alternative analyses. First, I consider an analysis where the particles project full phrases. This analysis runs into several problems. I will show that the problems cannot be solved with a simple movement analysis, as it is necessary to posit mandatory movement in some cases, optional movement in some cases, and in yet other cases we need to obligatorily *prevent* movement. Second, I consider a morphological analysis, where the verb and the particle are assumed to be combined in the lexicon. This hypothesis is rejected since the verb and the particle do not need to be adjacent, and since the verb-particle ordering goes against the rules of compounding in Swedish, which dictate that compounds are head-final.

2.1 Particles as non-projecting words

Both in traditional grammatical descriptions and in theoretical analyses of the Germanic languages, particles are widely recognized to form a class of their own (but see Lüdeling (2001) for a different view, which will be discussed in section 7.2). However, researchers differ in what formal status they attribute to particles.

One possibility that immediately comes to mind is to classify particles as a *grammatical function*, on a par with subject and object (Ejerhed 1978). This solution is problematic, however, since there is no function which is associated with *all* particles. A particle can be an aspect marker, a resultative predicate, or a directional complement. Moreover, there is no grammatical function that can *only* be realized as a particle. Aspectuality can also be expressed with an adverbial adjunct, a resultative predicate can be expressed with an AP following the object, and a directional complement can be expressed with a PP following the object, as will be demonstrated with numerous examples below, particularly in chapters 5 and 6 (see also Toivonen 2001).

Another possibility is that particles constitute their own *word class* or *syntactic category*, parallel to categories like verbs and nouns (Norén 1996). This position is problematic, since words from different syntactic categories can be particles:

Preposition:

(2.1) *Hon knäppte* **på** *teven.*
she clicked on TV.the
'She turned the TV on.' (PAR)

Adjective:

(2.2) *Sen började hon vicka* **loss** *foten.*
then began she wiggle loose foot.the
'Then she started to wiggle the foot free.' (PAR)

Verb:[1]

(2.3) *Rykten vill göra* **gällande** *att Håkan funderar på att ...*
rumors want make valid that H. thinks on to
'Rumor has it that Håkan is thinking about ...' (PAR)

Noun:

(2.4) *Jag ansåg mig oförmögen att köra* **bil**.
I considered me incapable of drive car
'I considered myself incapable of driving a car.' (PAR)

[1]The word *gällande* is a form of the verb *gälla* 'to hold, to be valid'.

The boldfaced words in (2.1-2.4) are drawn from four different syntactic categories, yet they are all particles. Swedish particles thus differ from the English particles, which have been claimed to all be prepositional (Jackendoff 1973). On the other hand, Zeller (1999) and Stiebels and Wunderlich (1994) show that German is like Swedish in that the particles are not necessarily prepositional. Particles from different word classes will be discussed further in chapter 5, and see also Ejerhed (1978), Teleman et al. (1999, Volume 3:417-435). Words such as those in (2.1-2.4) are traditionally called particles, since they have the characteristic particle properties listed in the introduction, and repeated here:

(2.5) (i) A particle is stressed.

(ii) A particle immediately follows the verbal position within the VP.

(iii) A particle cannot have a modifier or a complement.

I have no reason to reject the traditional analysis of these words. The prepositional and adjectival words are uncontroversial particles, but the nominal and verbal particles are not as well studied as the others. However, even if a non-particle analysis proves to be more appropriate for the verbs and the nouns, that is not a problem for the general theory of particles that I will argue for in this dissertation. For now, note that particles are drawn from different syntactic categories: that is, particles can be homophonous and synonymous with adjectives and prepositions, and at least seemingly also with nouns and verbs.[2]

Another reason to reject the hypothesis that particles form their own syntactic category is that syntactic categories are not limited in distribution the way particles are. For example, nouns can appear in many different positions within a sentence; the subject position, the object position, the prepositional object position, etc. Particles, however, are tied to the particle position (immediately adjacent to the verb).[3]

Finally, particles are limited to single words, and cannot have modifiers or complements. This is a problem both for the grammatical function and the syntactic category

[2]The nouns and verbs will be discussed more in chapter 5.

[3]The categories I consider are all lexical categories, since the particles are clearly not functional categories: functional categories are closed-class words with very limited semantic content. Particles have clear lexical content, as will become clear in chapter 7.

hypothesis: All other lexical categories allow their members to take complements and modifiers: it is true that there are examples of nouns and of subjects that are not modified and do not have a complement, but it is not a general fact about nouns or subjects that they cannot take modifiers and complements.

Particles thus cannot be classified as a distinct category or function. As was mentioned in the introduction, I will instead argue that their special status is due to their *phrase structural realization.* I will go over the arguments for this proposal immediately below.

First, verbal particles in Swedish precede the object (Haider 1997, Svenonius 1994, Taraldsen 1983):

(2.6) (a) *Peter sparkade (***bort***) bollen (*bort).*
P. kicked away ball.the away
'Peter kicked the ball away.'

(b) *Maria körde (***fram***) bilen (*fram).*
M. drove forth car.the forth
'Maria drove the car there.'

(c) *Simon kastade (***ut***) soporna (*ut).*
S. threw out garbage.the out
'Simon threw out the garbage.'

The pattern in (2.6) contrasts with Danish, where the particle follows the object (2.7). It also contrasts with Norwegian and English, where the particle can appear both before and after the object as exemplified in (2.8) for Norwegian and (2.9) for English:

(2.7) *Han knugede sine hænder sammen.* [Danish; Platzack 1998]
he clasped his hands together.PRT
'He clasped his hands.'

(2.8) *Vi slapp (ut) hunden (ut).* [Norwegian; Svenonius 1994]
we let (out) dog.the (out)
'We let the dog out.'

(2.9) *John threw (in) the garbage (in).*

Swedish thus differs from other Germanic languages with respect to the structural realization of particles.

The core proposal of this text is motivated by two distributional facts concerning the particles in Swedish. The first fact is that the particles appear in a position different from full phrases that have the same function in the sentence:

(2.10) (a) *Matts* *kastade* [$_{prt}$ **in**] *soporna.*
M. threw in garbage.the
'Matts threw in the garbage

(b) **Matts* *kastade* *soporna* *in.*
M. threw garbage.the in.

(2.11) (a) *Matts* *kastade* *soporna* [$_{PP}$ *i* *sopkorgen*].
M. threw garbage.the in garbage.can.the
'Matts threw the garbage in the garbage can.'

(b) **Matts* *kastade* *i* *sopkorgen* *soporna.*
M. threw in garbage.can.the garbage.the

The particle *in* in (2.10) has the same function as the PP *i sopkorgen* in (2.11): they both denote the place where the garbage is thrown. Even though their function within the sentence is the same, their distribution is different.

The second crucial fact is that particles cannot be modified:

(2.12) **Olle* *sparkade* [*längre* *bort*] *bollen.*
O. kicked further away ball.the

Recall that part of the definition of a particle is that it *immediately* follows the verbal position, and it must therefore precede the direct object. Some words are optionally particles—that is, they optionally appear in the particle position. It is possible to modify these words, but only when they are not in the particle position. Compare (2.12) to (2.13):

(2.13) *Olle* *sparkade* *bollen* [*längre* *bort*].
O. kicked ball.the further away.
'Olle kicked the ball further away.'

The corpus examples in (2.14) illustrate the same thing; *ut* precedes the object in (a) where is is unmodified, and it follows the object in (b) where it is modified:

(2.14) (a) *... och* *släpar* **ut** *honom.*
and drag out him
'... and drag him out.' (PAR)

(b) *Han* *vill* *inte* *säga* *det* *rakt* *ut.*
he wants not say it right out
'He does not want to say it straight out.' (PAR)

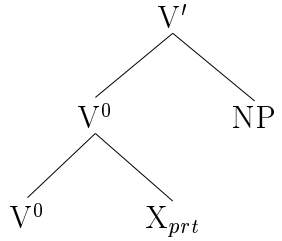
The examples in (2.12-2.14) demonstrate that a word in the particle position can never be modified, even if the same words can have a modifier elsewhere.

In sum, the data in (2.11-2.14) show that although single words can precede the object and appear in the particle position, this position is not available for full phrases. This can be accounted for if we allow for non-projecting words in the syntax. The key aspects of my proposal are given in (2.15):

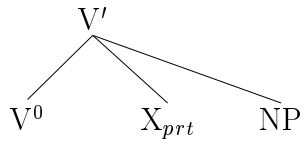
(2.15)
- Particles are non-projecting words; i.e. *X*s, which do not head X′ or XP.
- A particle can, in principle, be of any syntactic category (N, P, V, A).
- A non-projecting element is marked as such in the lexicon.
- Particles in Swedish are head-adjoined to V^0.

Each part of my proposal is empirically motivated. We have not yet seen evidence for the fourth claim of (2.15), that the particles are adjoined to V^0. The Swedish data we have seen thus far are equally compatible with each of the following two structures:

(2.16)



(2.17)



In chapter 5, I will provide evidence that the Swedish particles are, indeed, adjoined to V^0, as in (2.16). However, it is important to note that the issue of head-adjunction is actually orthogonal to the question of whether or not non-projecting words exist. Chapter 7 presents some English data concerning the complex particle construction that may be taken as evidence that it is possible for non-projecting words to be attached to V', as in (2.17) (although I also present an alternative analysis which does not force that conclusion).

There are theoretical reasons to prefer the structure in (2.16) over the one in (2.17). Allowing the presence of non-projecting words is a weakening of X'-theory. In order to keep the theory as restrictive as possible, I hypothesize in chapter 4 that the distribution of non-projecting words is governed by a constraint dictating that they are head-adjoined. As for Swedish particles, a simple phrase structure rule demanding that they are adjoined to V^0 easily accounts for their distribution. A structure like (2.17) leaves unexplained why the particles differ in distribution from PPs with the same function (see again examples (2.10-2.11)), since the particle (X_{prt}) could just as well follow the NP. If we require the particle to be head-adjoined to V^0, as in (2.16), it follows that it cannot appear after the object NP. These theoretical considerations favor structure (2.16) over structure (2.17).

The proposal in (2.15) will be spelled out in more detail in chapters 4 and 5. Before that, I will discuss three alternative analyses. Section 2.2 will lay out the problems with an analysis where the particles project full phrases, and section 2.3 will consider a morphological approach, under which the particles combine with verbs in the lexicon. Chapter 3 is devoted to a discussion of clitics, and I will show there that the particles do not fit under standard definitions of 'clitichood'.

2.2 Arguments against an XP analysis

In the previous section, we saw that only elements which do not take a complement and which are not modified may appear in the particle position preceding the object. These facts suggest that particles are words which do not project phrases, since phrases can normally contain complements and modifiers. This section provides a fuller discussion of problems that emerge if particles are treated as heads projecting full phrases, whether they are base-generated in surface position, or moved there.

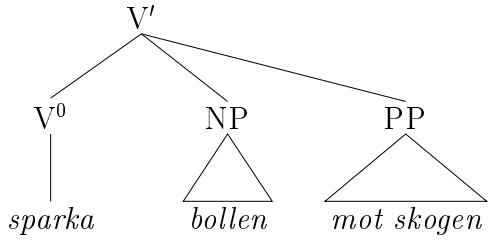
Emonds (1972) and Jackendoff (1973) and many others treat particles as intransitive, projecting prepositions. However, PPs differ from particles in distribution, even when the two appear to fulfill the same function. This was illustrated above in (2.10-2.11), and another example is given in (2.18):

(2.18) (a) *Petra försöker sparka (*mot skogen) bollen (mot skogen).*
P. tries kick (*towards forest.the) ball.the (towards forest.the)
'Petra tries to kick the ball towards the forest.'

(b) *Petra försöker sparka (**bort**) bollen (*bort).*
P. tries kick (away) ball.the (*away)
'Petra tries to kick the ball away.'

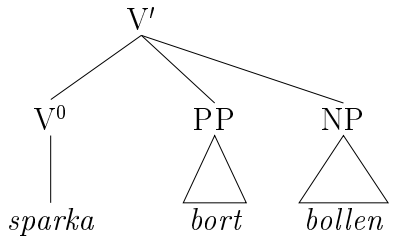
If we assume that the particle *bort* heads a phrase, the difference in distribution is difficult to account for. Compare the structures below:[4]

(2.19)



[4] I call *bort* a PP. The same point could be made claiming that *bort* heads an AP or AdvP, since both APs and AdvPs follow the DO in general. See the examples in (2.32-2.33).

(2.20)



The structures in (2.19-2.20) alone do not account for the data, since they also allow the ungrammatical versions of the sentences in (2.18), repeated here as (2.21):

(2.21) (a) **Petra sparkar mot skogen bollen.*
P. kicks towards forest.the ball.the

(b) **Petra sparkar bollen bort.*
P. kicks ball.the away

It is thus clear that it is not enough to note that (some) particles are intransitive prepositions: since *mot skogen* and *bort* in (2.18) have the same syntactic category and the same function, there is no way to rule out (2.21) if we assume the structures in (2.19-2.20).

In a framework which adopts transformation mechanisms, we could attempt to capture the difference with movement. However, a closer look at the data reveals that there is no straightforward movement mechanism that could capture the difference in distribution, given the assumption that particles project XPs.[5] Most movement accounts assume that the particles are intransitive prepositions, following Emonds (1972) and Jackendoff (1973). As has been pointed out above, not all particles are prepositional in Swedish, but for simplicity, the discussion here will mainly concern prepositional particles (although some of the examples at the end of the section contain adjectival particles).

Below, I will discuss some of the problems with a movement analysis. The main problems are (2.22):

[5]For the sake of simplicity, the discussion below refers to simple 'movement rules' (like those adopted in Emonds 1972) to account for the particle distribution in English. The same data would pose problems for theories where movement is a result of a general operation such as *Move* α, or where movement is forced by the need for feature checking.

(2.22)
- Some intransitive prepositions *must*, some *may*, and some *cannot* precede the object.
- The particle position and the post-object PP position may simultaneously be filled with lexical material.

I discuss the problems in (2.22) together with the relevant examples immediately below.

Most analyses assume a 'particle movement' rule, so the particle (and not the object NP) moves. I will consider such an analysis first. Let us assume the very simple movement rule in (2.23), bearing in mind that (2.23) is not the only possible formalization:

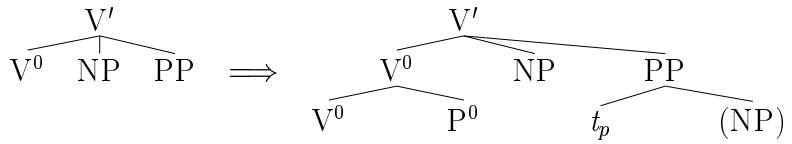
(2.23) Movement rule:
V NP PP $\Longrightarrow$ V PP NP

If obligatory, the movement rule in (2.23) would rule out sentences like the grammatical (2.11a), repeated here as (2.24):

(2.24) *Matts kastade soporna* [$_{PP}$ *i sopkorgen*].
M. threw garbage.the in garbage.can.the
'Matts threw the garbage in the garbage can.'

The rule in (2.23) is obviously not a valid solution, since it rules out grammatical sentences. Let us therefore consider a slightly more complicated movement rule:

(2.25) Movement rule 2:



The rule in (2.25) is intended to indicate that the prepositional head P^0 adjoins to the verbal head. Rule (2.25) stipulates that only a head (and not a full phrase) can precede the object NP. However, (2.25) allows stranding of the prepositional object (*skogen* in (2.18a)), which leads to the ungrammatical sentence (2.26):

(2.26) **Petra sparkar mot$_i$ bollen* t$_i$ *skogen.*
P. kicks towards ball.the forest.the

To rule out sentences like (2.26), we need a constraint preventing transitive prepositions from head-adjoining. This could be formalized in different ways, but for the present purposes we will just use the statement in (2.27):

(2.27) A transitive preposition cannot adjoin to the verb.

The constraint in (2.27) is problematic, since it makes particle movement seem different from other head movement. In verb movement, for example, there is no difference between transitive and intransitive verbs. Moreover, the constraint in (2.27) is not enough to rescue the movement analysis of (2.25), since there are intransitive prepositions which follow the direct object:[6]

(2.28) (a) *Fia ställer glaset där.*
F. stands glass.the there
'Fia puts the glass there.'

(b) *Markus kastade bollen uppåt.*
M. threw ball.the upwards
'Markus threw the ball upwards.'

If words like *upp* and *dit* are intransitive prepositions (see Emonds 1972, Svenonius 1994, den Dikken 1995 for English), *där* and *uppåt* should also be classified as such: *där* and *uppåt* are very similar in function and meaning to *dit* and *upp*, and *uppåt* can take a complement (it is optionally transitive) and form a PP such as *uppåt stigen* 'up the path'.[7] The rule in (2.25) then generates the ungrammatical examples in (2.29):

(2.29) (a) **Fia ställer där glaset.*
F. puts there glass.the

(b) **Markus kastade uppåt bollen.*
M. threw upwards ball.the

[6]The locational *här/där* 'here/there' and the directional *hit/dit* 'here/there' can never be nouns in Swedish. Swedish thus differs from English, where 'there' can be a complement of verbs that select for an NP. The Swedish equivalent of 'leave there' is thus ungrammatical.

[7]The option of having a prepositional complement is usually taken as evidence of prepositionhood (Emonds 1972).

The restriction in (2.27) cannot rule out (2.29), since *där* and *uppåt* are not transitive here.

There is one further problem. Our hypothesis, based on (2.25), predicts that (2.31) could be derived from (2.30):

(2.30) (a) *Maria sparkade bollen rakt upp.*
M. kicked ball.the straight up
'Maria kicked the ball straight up.'

(b) *Simon körde bilen ända fram.*
S. drove car.the all.the.way forth
'Simon drove car.the all the way there.'

(2.31) (a) **Maria sparkade* upp_i *bollen rakt* t_i.
M. kicked up ball.the straight

(b) **Simon körde* $fram_i$ *bilen ända* t_i.
S. drove forth car.the all.the.way

The restriction in (2.27) does not exclude *modified* prepositions, so the examples in (2.31) are incorrectly predicted to be grammatical.

An alternative movement analysis would be to move the direct object across the PP. The underlying structure is then V-PP-NP and the derived structure is V-NP-PP, caused by movement of the NP. This analysis runs into the same problems as the analysis positing movement of the intransitive PP. We need to prevent the NP from moving across PPs headed by *bort* in (2.18b) while it has to move across PPs headed by transitive prepositions, modified PPs, and also across PPs headed by certain intransitive prepositions, such as *där* (2.28a).

Labelling the particles adjectives and adverbs (which head APs or AdvPs) will not help the situation. We could hypothesize that the particles and PPs differ in distribution because particles are not prepositional, but instead adverbial or adjectival. However, 'regular' APs and AdvPs cannot precede direct objects any more than full PPs can:

(2.32) (a) *... och klöst (*blodig) honom (blodig).*
and scratched bloody him bloody
'...and scratched him bloody.' (PAR)

(b) *Birgitta strök (*torra) Runars kinder (torra).*
B. stroked dry R.'s cheeks dry
'Birgitta wiped Runar's cheeks dry.' (PAR)

(c) *Han skrek (*alldeles brinnande röd) sig (alldeles*
he screamed completely burning red himself completely
brinnande röd) ...
burning red
'He screamed himself completely red ...' (PAR)

The examples in (2.32) contain post-object APs. Some particles are adjectival in nature:

(2.33) (a) *Sandra sparkade* **ihjäl** *ormen.*
S. kicked to.death snake.the
'Sandra kicked the snake dead.'

(b) *Han knöt* **fast** *den med tre dubbla råbandsknopar och*
he tied stuck/tight it with three double square.knots and
tolv kärringknutar
twelve granny.knots
'He tied it up tight three double square knots and twelve granny knots.'
(PAR)

The examples in (2.32-2.33) mirror the prepositions in distribution: the adjectival particles precede the direct object whereas full APs follow it.

A final, quite serious problem for a movement analysis is the fact that the position where the particle is supposed to have originated can be occupied by other lexical material:

(2.34) (a) *... att dela* **sönder** *malmen i bitar...*
to break broken ore.the in pieces
'...to break the iron ore into pieces...' (PAR)

(b) *Charles häller* **upp** *det sista ölet i sitt glas.*
C. pours up the last beer.the in his.REFL glass
'Charlec pours the rest of his beer into his glass.' (PAR)

If we assume that *sönder* in (2.34a) originates in the position where full XP resultatives normally appear, and further assume that there is only one unique resultative position,

then it is difficult to explain how *i bitar* can also occupy that same slot. Similarly, it is difficult to explain how *i sitt glas* in (2.34b) can occupy the 'original' position of the particle *upp*.

This section has discussed the problems that arise if we assume that particles head full phrases, like PPs or APs. A base-generated account referring solely to XPs cannot capture the difference in distribution between 'particle XPs' and other XPs, since they do not (necessarily) differ in function, but only in form. A movement account runs into several empirical problems, which have been laid out above. A movement account is also initially unappealing, since it lacks motivation: there is no theory-independent evidence that particles originate in a position following the direct object. Moreover, the hypothesized original ('trace') position can be filled with lexical material.

This section has obviously not proven that a movement analysis is *impossible*. We can of course add machinery and idiosyncratic lexical features which would make it possible give a transformational analysis of particles. The purpose of the discussion above is simply to show that such an analysis is not as attractive or straightforward as it might first seem. For fuller discussions of different movement analyses, see Nicol (1999), Ishikawa (1999), Josefsson (1998), Klipple (1997), Collins and Thráinsson (1996), den Dikken (1995), Svenonius (1994), Taraldsen (1991), Guéron (1990), Kayne (1985), Emonds (1972, 1985), and references cited in those works, but see Booij (1990) for arguments aganst a movement analysis of the particles in Dutch.

Note that under any kind of movement analysis, some kind of arbitrary lexical specification will be necessary in order to distinguish particles from other intransitive prepositions: recall especially the examples in (2.28). The data seem to require an analysis where a word needs to be marked for whether or not it is a particle, and that is also in a sense what I assume. However, I specifically assume that each word is marked for whether it projects a phrase or not. If the hypothesis was instead that all words project (particles also), and some prepositions[8] are marked for whether or not they move to some position preceding the object, it would be completely accidental that the phrases that move happen to be intransitive, unmodified PPs.

[8] We will have to include other word classes here as well.

2.3 Arguments against a morphological analysis

In the previous section it was argued that particles do not project full phrases. I have taken this as evidence that particles are non-projecting words which are syntactically adjoined to the verb. However, the fact that particles do not project phrases would also be explained if the verbs and the particles were combined in the lexicon, as has been proposed by Neeleman and Weerman (1993; henceforth N&W) for Dutch.[9] In this section, I will argue that the Swedish verbs and particles are not inserted into c-structure as a single lexical word.[10] The main arguments are:

(2.35) (a) Verbs and particles can be separated in the c-structure.

(b) The particle follows the verb, and morphological constructs are head-final in Swedish.

I will discuss each of the arguments in (2.35) below together with relevant examples.[11]

Recall that the finite verb in Swedish generally appears in a functional projection outside the VP (IP or CP), although the particle must appear within VP. Other lexical material can then intervene between the verb and the particle:

(2.36) (a) *Niklas körde förmodligen* **dit** *bilen.*
N. drove probably there car.the
'Niklas probably drove the car there.'

(b) *Jonna läste aldrig* **ut** *boken.*
J. never read out book.the
'Jonna never finished the book.'

(c) *Slängde Peter* **bort** *boken?*
threw P. away book.the
'Did Peter throw the book away?'

[9]See Zeller (1999) and Müller (2000) for discussions of problems with N&W's analysis as it concerns Dutch and German. In section 7.3.3, I will argue that a morphological analysis is appropriate for English.

[10]There are different notions of what a word is (Matsumoto 1996, Ackerman and Webelhuth 1998). Here, I mean a terminal node in the c-structure tree.

[11]Discussing verbal particles in Dutch, Booij (1990) proposes an analysis similar to mine, and he also argues against a morphological analysis. Our analyses differ in that Booij does not assume that the particles are adjoined at the V^0-level, but rather at a level between X^0 and X'. Moreover, although Booij seems to assume that the particles do not project phrases, he does not explicitly discuss this.

The examples in (2.36) show that the particle may be separated from the verb; see, e.g., *körde* and *dit* in the (a) sentence. If we assume that *körde* and *dit* constitute one single word, the fact that they can be separated is a violation of the principle of lexical integrity, which is widely adopted across theoretical frameworks.[12] Two formulations of this principle drawn from the LFG tradition are given in (2.37-2.38):

(2.37) *The lexical integrity principle* (Bresnan & Mchombo 1995)
Words are built of different structural elements and by different principles of composition than syntactic phrases.

(2.38) *The lexical integrity principle* (Bresnan 2001:92)
Morphologically complete words are leaves of the c-structure tree and each leaf corresponds to one and only one c-structure node.

According to the principle of lexical integrity, the internal structure of lexical constructs is invisible to c-structure syntax, and parts of an individual morphological word cannot be separated in the c-structure.[13] The examples in (2.36) thus show that verbs and particles are not combined in the lexicon.

The second argument against a morphological analysis is based on the derivation of new words from verbs and particles. Morphological constructs are head-final in Swedish, but the kinds of verb-particle combinations in the examples we have seen until now are not head-final (the particle follows the verbal head). There are examples of verb-particle combinations where the verb is final. These are morphologically derived words. Examples are given in (2.39-2.40), where the (a) sentences are the corresponding underived verb-particle combinations:

(2.39) (a) *Karin* *lånade* **ut** *böckerna.*
K. lent out books.the
'Karin lent the books out.'

[12]N&W acknowledge the fact that their proposal violates lexical integrity, but they are willing to give up this notion. In my opinion, the arguments for a morphological treatment of verb-particle combinations are not strong enough to warrant such a step.

[13]Although mismatches between c-structure and f-structure 'words' are allowed (Andrews (1990), Bresnan and Mchombo (1995),Toivonen (2000c), Bresnan (2001) and references).

(b) *Böckerna är/blev* **ut***lånade.*
books.the are/got out.lent
'The books are/got lent out.'

(c) **Böckerna är/blev lånade* **ut***.*
books.the are/got lent out

(d) **Ut***låningen av böcker har ökat.*
out.lending.the of books.the has increased
'The lending of books has increased.'

(e) **Låningen* **ut** *av böcker har ökat.*
lending.the out of books has increased

(f) *... de ska träffa alla* **ut***lånare på kreditmarknaden.*
they will meet all out.lenders on credit.market.the
'... they will meet all the lenders on the credit market.' (PAR)

(g) **De ska träffa alla lånare* **ut** *på kreditmarknaden.*
they will meet all lenders out on credit.market.the

(2.40) (a) *Kalle skjutsade* **hem** *flickan.*
K. drove home girl.the
'Kalle drove the girl home.'

(b) *Flickan är/blev* **hem***skjutsad.*
girl.the is/got home.driven
'The girl are/got driven home.'

(c) *?Flickan är/blev skjutsad* **hem***.*
girl.the is/got driven home

(d) **Hem***skjutsningen av flickan gick bra.*
home.driving of girl.the went well
'Driving the girl home went well.'

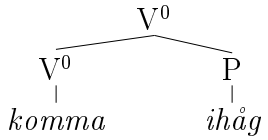
(e) **Skjutsningen* **hem** *av flickan gick bra*
driving home of girl.the went well

In the examples above, we see that a verb and a particle can be combined to form adjectival (passive) participles (*utlånade* and *hemskjutsad*) and nouns (*utlåningen, utlånare*

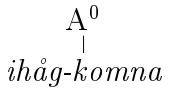
and *hemskjutsningen*).[14] Note the difference in particle-verb ordering: in the derived words the particle precedes the verb, although the particle normally follows the verb.[15]

The difference between verb-particle combinations (V+Prt) in the (a) examples in (2.39-2.40) and the particle-head combinations (Prt+X) in the (b) and (d) examples is that the former is a syntactic and the latter is a morphological construct, as illustrated in (2.41-2.42) below:

(2.41) c-structure V+Prt (two morphological words):



(2.42) c-structure Prt+X (one morphological word):



In LFG, morphological word formation is assumed to be governed by principles independent of syntactic combinataons of words, so it is not surprising that (2.41) is realized differently than (2.42).[16]

Let me repeat the two facts that support the distinction in (2.41-2.42). First of all, although the V+Prt combinations are separable in the c-structure, but the X+Prt combinations are not. Second, compounds are exclusively head-final in Swedish. For example, a newly formed compound like *hundhatt* 'dog hat' is necessarily a kind of hat, not a kind of dog. So the fact that the particle follows the verbal head in V+Prt combinations suggests that these are not morphological constructs. The Prt+X combinations however, are head-final just like other compounds.

[14] It sounds a bit funny to say *hemskjutsare* 'home-driver', but it is not ungrammatical. **Skjutsare hem* is impossible.

[15] Vinka (1999) reports passive participles such as *stängd av* 'turned off', and one of my informants also (marginally) accepts such examples (in addition to the Standard Swedish examples). Standard Swedish (as well as my own dialect) only allows *avstängd*, and in the PAROLE corpus, I found 195 instances of *avstängd* and no instances of *stängd av*. Although Vinka's dialect is very interesting, it will be set aside here, as it does not pose any problems for the general points made in this chapter.

[16] Kanerva (1987), Bresnan and Mchombo (1995), Matsumoto (1996) and others discuss the difference between morphology and syntax.

The head of a V+Prt combination can be a finite verb (as seen in (2.39a) and (2.40a)), a past participle (2.43a), or an infinitive (2.43b-c):

(2.43) (a) *... för hon och pappa hade redan rivit* **sönder** *dom*
because she and daddy had already ripped broken them
och kastat **bort** *dom.*
and thrown away them
'... because she and daddy had already ripped them up and thrown them away.' (PAR)

(b) *Då ska vi be henne att komma* **in**.
then shall we ask her to come in
'Then we'll ask her to come in.' (PAR)

(c) *Om folk kan komma* **ihåg** *ett namn som Schwarzenegger...*
if people can come to.mind a name like S.
'If people can remember a name like Schwarzenegger...' (PAR)

The head of a derived Prt+X combination can be of any word class. We already saw a few examples above, and some adjectives are given in (2.44):

(2.44) (a) **Sönder***brutna eller* **bort***kastade vapen låg i bråtar.*
broken.broken or away.thrown weapons lay in piles.
'Guns that had been broken into pieces or thrown away lay in piles.' (PAR)

(b) *... det nya datoriserade telefonsystemet styr den*
the new computerized telephone.system directs the
in*kommande trafiken till rätt tjänsteman.*
in.coming traffic to right employee.
'...the new computerized phone system directs the incoming traffic to the right employee.' (PAR)

(c) *Man försöker välja lätt* **ihåg***komna namn...*
one tries to.choose easily to.mind.come names
'One tries to choose names that are easily remembered...' (PAR)

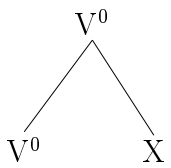
The examples in (2.44) are clearly the output of derivational morphology, as their word class has changed from verb to adjective.

Together, the data in this section show that verbs and particles can combine lexically. However, a lexical verb-particle combination can easily be distinguished from the verb-particle construct which are the main focus here: lexical combinations are head-final and cannot be separated in the syntax.

2.4 Summary

Verbal particles have two main characteristics which distinguish them from other words and phrases: 1) they cannot take modifiers and complements; and 2) they must be adjacent to the verbal position in the VP. These facts fall neatly out of an analysis where the particles are non-projecting words that are syntactically head-adjoined to the verb:

(2.45)



The difference between particles and other words is thus purely structural: non-particles project phrases whereas particles do not. Importantly, Swedish particles are not tied to any one syntactic category or grammatical function.

This chapter considered two alternative analyses. First, we considered the possibility that particles do project full phrases, just like other words. This approach was rejected, since there is no criterion by which we can distinguish particles from other words if we do not assume a structural difference between them.

Second, we considered the possibility that particles are adjoined to verbs in the lexicon. This hypothesis was rejected for two reasons: First, verbs and particles can be separated in the syntax. Second, morphological words are head-final in Swedish, but verbs generally precede their particles.

Chapter 3

Particles and 'clitics'

In the previous chapter, I proposed that particles are non-projecting words that are syntactically adjoined to the verb. Single words which are syntactically head-adjoined are often referred to as clitics in the literature (Keyser and Roeper 1992, Jaeggli 1986, Pulleyblank 1986 and others); in fact, Josefsson (1998:149) and Holmberg (1986:201) suggest that the Swedish particles are clitics, or 'clitic-like'. In this chapter, I will argue that particles cannot be considered *clitics* under standard definitions of clitichood, since they are not phonologically weak. In order to capture the similarities and differences between particles and prototypical clitics, I introduce a new typology of words, where the word 'clitic' is abandoned as a unifying theoretical term. Instead, words are divided up along two dimensions: syntactic projectivity (whether or not the word projects a phrase) and phonological dependence (whether or not the word is phonologically dependent on another word).

3.1 Testing particles for clitichood

The word *clitic* has been used to refer to a wide range of elements. Zwicky (1994) and Sadock (1995) show that it is impossible to come up with a definition of clitic that includes all the elements that have been labeled as such (see also van Riemsdijk (1999a), who makes a similar point). However, there is a strong tendency in the literature to use the label 'clitic' for elements which are equivalent to a word as far as the syntax is

concerned, but are phonologically dependent on a host; that is, it needs to phonologically attach to another word or phrase, although it is not a lexically bound morpheme of that host. But how do we know if a word is phonologically dependent on another word? Halpern (1995:14) offers the following 'rule of thumb' diagnostics for clitichood: 1) being (lexically) stressless/accentless; and 2) occupying one of a characteristic set of positions (second position, adjacent to the predicate of a clause, etc.). In this section, I discuss data that suggests that the particles are not clitics, at least not under the definition that is concerned with phonological dependence.

Swedish particles are stressed (Kjellman 1929, Norén 1996:214, Platzack 1998:176, Teleman et al. 1999). Compare (3.1a) to (3.1b), for example:

(3.1) (a) *Johan bröt áv pennan.*
J. broke off pencil.the
'Johan broke the pencil in two.'

(b) *Johanna fick pennan av Johan.*
J. got pencil.the from J.
'Johanna got the pencil from Johan.'

In (3.1a), the word *av* is used as a particle, and it is stressed (as indicated by the acute accent). In (3.1b), however, *av* is a preposition (with the complement *Johan*) and is not stressed (see Kjellman (1929), Hellberg (1976), and Ralph (1987) for further discussion of differences between prepositions and particles in Swedish). Since Swedish particles are stressed, they do not fall under Halpern's clitichood definition.

A second property of clitics is that they need to be adjacent to a particular host. This also does not hold true for particles. The particle and the verb seem to form a semantic unit (Norén 1996), and the 'natural' host for the particle would therefore be the verb. As we have already seen above, however, the particle does not need to appear next to the verb. The particle is always next to the verbal position within the VP, but the finite verb is often positioned higher up in the clause, since Swedish is a V2 language. This was discussed in section 1.2 above, and additional examples are given in (3.2):

(3.2) (a) *Chauffören slängde nonchalant* **ut** *sin fimp*
driver.the threw nonchalant out his.REFL cigarette.butt
genom fönstret.
through window.the
'The driver nonchalantly threw his cigarette butt out the window.' (PAR)

(b) *... när jag blev äldre så glömde jag* **bort** *dom där goda*
when I got older so forgot I away those there good
råden.
advice.the
'...when I got older, I forgot those pieces of good advice.' (PAR)

(c) *Hon sparkade inte* **ut** *honom.*
she kicked not out him
'She didn't kick him out.' (PAR)

It is clear from the examples in (3.2) that the particle does not cliticize to the verb in the phonological sense. In (3.2a), the adverb *nonchalant* comes in between the verb *slängde* and the particle *ut*. In (3.2b), the subject *jag* intervenes between *glömde* and *bort*. In (3.2c), the negation *inte* comes in between the verb and the particle.

It is also clear that the particles are not pro-clitics, cliticizing to the direct object. Consider the sentences in (3.3):[1]

(3.3) (a) *Boken slängde han* **bort**.
book.the threw he away
'The book is what he threw away.'

(b) *Pennan bröt hon* **av**, *men suddgummit sparade hon.*
pencil.the broke she off, but eraser.the saved she
'The pencil she broke in two, but the eraser she saved.'

In (3.3), the direct objects are topicalized and thus separated from the particles. Together, examples (3.2-3.3) make it clear that the particles do not need a fixed phonological host.

Note also that some particles can function as the main predicate of the clause. This is particularly common in imperative sentences:

[1] Thanks to Johan Persson for the example in (3.3b).

(3.4) (a) *Hit med smöret!*
here with butter.the
'Give me the butter.'

(b) *Upp med händerna!*
up with hands.the
'Hands up!'

The particles in (3.4) are stressed, and they are clearly not cliticized to the predicate (since they *are* the predicates) or the direct object.

A clitic is necessarily either a proclitic or a enclitic. The Swedish particles are neither, as is clear from the examples above: in (3.3), the particle has nothing on its right, and in (3.4), it has nothing on its left.

There is a further diagnostic that can be used to argue that an element is phonologically connected to another element: morphophonological alternations. The indefinite articles in English provide an example. They alternate between *a* and *an* preceding consonants and vowels, respectively. The Swedish particles do not undergo any such alternation, which might be expected if they were phonologically dependent.

To conclude, Swedish particles do not pass any of the traditional clitichood tests: they are not phonologically 'weak', nor do they need to appear next to a given host, or in second position. The particles therefore cannot be analyzed as clitics, although they are non-projecting words which head-adjoin syntactically.

3.2 A new typology of 'clitics'

A clitic has been defined here as a syntactically independent word which is phonologically dependent on another word. As mentioned above, the word *clitic* has been used in the literature with other definitions as well (see Zwicky 1994 for an overview of definitions of clitics). In fact, some authors define clitics as non-projecting heads, adjoined to another head (see Keyser and Roeper 1992, for example). A situation where the same label is used in connection with various distinct definitions should clearly be avoided. Instead of dividing words into clitics and non-clitics, I propose that words should be divided according to two parameters: whether they project phrases, and whether they

are phonologically dependent. Words can then be realized in four different ways in the phrase structure:

(3.5) The projection/dependence matrix

	non-projecting	projecting
phonologically dependent	**1**	**2**
not phonologically dependent	**3**	**4**

Swedish particles are non-projecting words which are not phonologically dependent; that is, they belong to type 3 in (3.5) above. In (3.6) we see a mini-typology, making use of the new classification:

(3.6)

	NON-PROJECTING	PROJECTING
PHONOLOGICALLY DEPENDENT	French 'clitic' pronouns Serbo-Croatian pronouns and auxiliaries	Kwakwala and Yagua determiners English reduced auxiliaries Swedish genitive marker Finnish, Russian and Bulgarian question particles
PHONOLOGICALLY INDEPENDENT	Swedish verbal particles Yoruba weak pronouns	English verbs Yoruba strong pronouns Estonian question particles

The formal status of non-projecting elements will be spelled out in detail in the following chapters, mainly focussing on the Swedish particles. I will devote the rest of this chapter to a brief discussion of some of the other cross-linguistic data referred to in (3.6), supporting its placement in (3.6).

3.2.1 Phonologically dependent and non-projecting

French 'clitic' pronouns such as *le* and *la* are non-projecting heads, since they are never modified or coordinated.[2] In addition, we know that they are phonologically dependent

[2]The French pronouns under discussion here are normally analyzed as clitics (Kayne (1975), Haegeman (1996), Zwart (1996) and references in those works). However, they have also been analyzed as

since they are unstressed, and they alternate with the allomorph *l* when they immediately precede a vowel:[3]

(3.7) (a) *Je la/*l' vois.*
I her see
'I see her.'

(b) *L'/*La as-tu vu?*
her have-you seen
'Have you seen him?'

The French clitic pronouns never appear alone without any morphological material to lean on:[4]

(3.8) (a) *Qui as-tu vu?*
who haveyou seen
'Who did you see?'

(b) **Le/*la/*les.* [intended as an answer to (a).]
him/ her/ them

The ungrammaticality of (3.8b) lends further support to the claim that the pronouns are phonologically dependent.

French clitic pronouns differ in distribution from full NPs:

(3.9) (a) *Je la/*Marie vois.*
I her/ M. see
'I see her.'

(b) *Je vois Marie/*la.*
I see M./ her
'I see Marie.'

bound morphemes by Miller (1992) and Miller and Sag (1995, 1997). For discussion, see Hirschbühler and Labelle (1999a,b).

[3]The examples in (3.7) and (3.9) are adapted from Zwart (1996:588). I have changed the masculine *le* in Zwart's examples to feminine *la*, since an unstressed schwa (the final vowel in *le*) is often dropped independently in many varieties of French. Thanks to Luc Baronian for help with these examples.

[4]The example in (3.8) is taken from van Riemsdijk (1999:3).

The pronoun *la* and the proper name *Marie* have the same function in (3.9): they are both direct objects of the verb *voir* 'see'. Yet they differ in distribution. This fact is explained if we assume that they differ not only phonologically but also in phrase-structural status: Fully projecting objects appear in the complement position of the verb, whereas non-projecting pronouns head-adjoin to the left of I^0.

The Serbo-Croatian 'clitic' auxiliaries and pronouns also fall into the non-projecting phonologically dependent class. For data and discussion, see Progovac (1996) and Radanović-Kocić (1996), who offer two different analyses of the clitics. Both analyses differ from the present account of the French clitics, but the data is compatible with such an analysis.

3.2.2 Phonologically dependent and projecting

Kwakwala and Yagua determiners (which consist of a demonstrative or a possessive, sometimes preceded by a case marker) project DPs, and are phonologically dependent on a host. An interesting fact about both Kwakwala and Yagua is that although the determiners take an NP complement on the right, they are phonologically 'enclitic', that is, dependent on a host on the left (Anderson 1984, 1993, Payne and Payne 1990, Spencer 1991). A Kwakwala example from Anderson (1984) is given in (3.10), where = denotes phonological attachment and [ ] marks syntactic constituency:

(3.10) *k^{w}ix?id[=ida bEg^{w}anEma][=x=a q'asa][=s=is t'Elwag^{w}ayu]*
clubbed=the man=OBJ=the otter=INSTR=his club
'The man clubbed the otter with his club.'

The following examples from Yagua (Payne and Payne 1990:365) show that it does not matter what the syntactic category of the phonological host is:

(3.11) (a)

sapṷṷchiy	*Pauro*	*roorivyiimuníí*	*Anita*
sa-pṷṷchiy	Pauro	rooriy-vɨɨmu-[**níí**	Anita]
3SG-lead/carry	Paul	house-inside-3SG	Anita

'Paul leads/carries Anita inside a/the house.'

(b)

siimyimaa	*Tomáásara*	*jásuchee*
sa-jimyiy-maa	Tomáása-[**rà**	jásuuchee]
3SG-eat-PERFECT	Tom-INANIMATE	manioc

'Tom has eaten the manioc.'

(c)

rąą	*jasítya*	*jáádiñíí*	*jiñuvṷ*
ray-ą	jasítya	jáádiy-[**níí**	jiy-nuvṷ]
1SG-IRREALIS	defeather	first-3SG	2SG-kill(noun)

'I will defeather your kill first.'

In (3.10-3.11), we see that the determiners, which (at least under some analyses) project a DP, are phonologically dependent on a host to their left, and that host is not restricted for syntactic category. In (3.11a), the determiner is adjoined to a postposition, in (3.11b) to a noun, and in (3.11c) to an adverb. Although the determiners attach to whatever precedes them, nothing can intervene between the enclitic and the nominal object (Payne and Payne, 1990:366).

Another class of words that are phonologically dependent even though they project phrases are English auxiliaries (Nordlinger and Sadler 2000, Bender and Sag 1999, Barron 1998, Sadler 1997, van der Leeuw 1997, Sadock 1991, Spencer 1991, Inkelas 1989, Kaisse 1985). It has been noted that there are systematic differences between two groups of reduced auxiliaries in English. Here we will focus on the group that Inkelas labels 'clitics'; that is, the 'idiosyncratic, lexically listed bound forms' and not reduced forms which are 'simply the derived surface form of function words in unstressed phrasal position' (1989:296). Inkelas lists the following forms of auxiliaries in English:

(3.12)

stressed form	clitic form
has	's
have	'v
is	's
will	'l

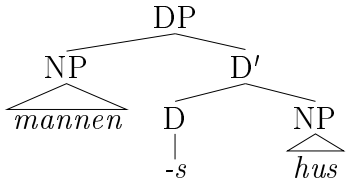
Inkelas notes that a clitic auxiliary cannot appear phrase-initially:

(3.13) **L Eric ever renew his ACLU membership?*
(intended: *Will Eric ever renew his ACLU membership?*)

The English 'clitic' auxiliaries are phonologically dependent on a host to their left. Given the additional standard assumption that all English auxiliaries occupy I^0, which projects an IP, we see that English auxiliaries are similar to the Kwakwala and Yagua determiners, in that they are projecting, phonologically dependent words.[5]

The Swedish genitive marker *-s* is a phonologically dependent projecting head which projects a DP:[6]

(3.14)



According to standard analyses of the Swedish genitive, the possessor is located in the specifier possition of DP, whereas the genitive marker *-s* is in D. If the possessor is a full phrase, the genitive marker goes at the end of that phrase, as we see in example (3.15), taken from Norde (1997: 68):

(3.15) *kungen av Danmarks slott*
king.the of Denmark-s castle
'the king of Denmark's castle'

For further discussion of the Swedish genitive, see Johannessen (1989), Delsing (1991), Perridon (1994), and Norde (1997:63-71).[7]

[5]Sadler (1997) and Barron (1998) argue that some English auxiliaries have in fact lost their status as independent c-structure words, and that they are now morphologically bound morphemes, bound to certain subject pronouns. It is however, uncontroversial that at least some of the auxiliaries in English are phonologically bound but syntactically projecting.

[6]The representation in (3.14) is adapted from Norde (1997:228). My representation is not exactly identical to Norde's, but the structure is the same. I have made some changes to make it consistent with my other tree diagrams.

[7]This is simlar to the structure that Barker (1995:6) assumes for English.

For evidence that the Finnish question particle *-ko/-kö* is a projecting head C^0 which is phonologically dependent, see Kanerva (1987), Vainikka (1989), and Rudin et al. (1995). For the Russian and Bulgarian particle *li*, see Rudin et al (1995).

3.2.3 Phonologically independent and non-projecting

As noted in the previous chapter, Swedish particles are not phonologically dependent, although they are non-projecting. Other examples of such words can be found in pronominal systems cross-linguistically. We will discuss Yoruba pronouns here, and all of section 3.3 is devoted to the pronominal systems of Germanic and Romance, as characterized by Cardinaletti and Starke (1996, 1999).

Yoruba pronouns are traditionally divided into *weak* and *strong* forms (Bamgboṡe 1966, 1980, Pulleyblank 1986). Some examples of the two pronominal sets are given in (3.16) (Pulleyblank 1986:43):

(3.16)

Strong series		Weak series	
èmí lọ	'*I* went'	*mo lọ*	'I went'
àwá lọ	'*we* went'	*a lọ*	'we went'

There are several important differences between the two types of pronouns. The strong pronouns can be modified and conjoined, whereas the weak pronouns cannot. Strong pronouns have the same syntactic distribution as nonpronominal nouns. Weak pronouns, however, are more restricted: they cannot head a cleft construction, and they cannot occur in topic position. These differences can be accounted for if we analyze the strong pronouns as projecting words and weak pronouns as non-projecting words.

3.2.4 Phonologically independent and projecting

The final group in the projection/dependence matrix consists of projecting words which are not phonologically dependent on a host. This group is the least problematic one, in that it falls neatly into the assumptions of X′-theory, which will be discussed further in chapter 4.

3.3 Weak pronouns

I will devote this section to a discussion of how the typology discussed in the previous section relates to the proposal made by Cardinaletti (1999) and Cardinaletti and Starke (1996, 1999), henceforth C&S. Based on evidence from Romance and Germanic languages, C&S show that there are three classes of pronouns.[8] They refer to these classes as *strong, weak* and *clitic* pronouns. The Olang Tirolese examples in (3.17-3.18) illustrate the three-way distinction between the pronouns. The examples are taken from C&S (1999:166), and they cite Oberleiter and Sfriso (1993):

(3.17) Olang Tirolese, subjects:

(a) **E:r** *isch* *intelligent.*
he is intelligent
'He is intelligent.'

(b) **Es** *isch* *toire.*
it is expensive
'It is expensive.'

(c) ***S** *isch* *toire.*
it is intelligent.

(3.18) Olang Tirolese, coordination:

(a) **E:r** *und* **si:** *sain* *intelligent.*
he and she are intelligent
'He and she are intelligent.'

(b) ***Es** *und* **es** *sain* *toire.*
it and it are expensive

(c) *... *dass* **z** *und* **z** *toire* *sain.*
that it and it expensive are

In Olang Tirolese, the masculine singular pronoun *e:r* (a strong pronoun) can be a subject, and it can be coordinated with other words; the neuter singular pronoun *es* (a

[8]Kiparsky (1991) also notes that pronouns divide into three groups. His discussion covers the binding properties of the pronouns.

weak pronoun) can be a subject, but it cannot be coordinated with other words; and the reduced neuter pronoun *s*[9] (a clitic pronoun) cannot be a subject and it cannot be coordinated. This illustrates the three-way distinctions that C&S make. For more data and discussion, I refer to their work, and also Bayer (1999), Diesing (1999), and Dobrovie-Sorin (1999), Haegeman (1996, 1999), Holmberg (1986, 1999) and Uriagereka (1999).

According to C&S, the weak pronouns are similar to the strong ones in that they can both appear in the initial positions in V2 clauses (German). On the other hand, the weak pronouns pattern with the clitics to the exclusion of the strong pronouns in the following three respects: the weak pronouns cannot appear outside of their clause (e.g., topicalized); and they cannot be modified or coordinated. C&S propose that the strong and weak pronouns are distinguished from the clitics in that that the former two are XPs and the latter are X^0s. C&S (1996) do not show a formal difference between the strong and the weak pronouns, but they list three descriptive differences:

(3.19) Cardinaletti and Starke (1996: 37)

strong	weak	clitic
XP	XP	X^0
	locality *modification *coordination	locality *modification *coordination

This tripartition lends itself easily to the typology laid out in this chapter. C&S's strong pronouns are projecting heads which are not phonologically dependent; the weak pronouns are not phonologically dependent and non-projecting; and the clitics are phonologically dependent and non-projecting:[10]

(3.20)

	non-projecting	projecting
phon. dependent	'clitics'	
not phon. dependent	weak pronouns	strong pronouns

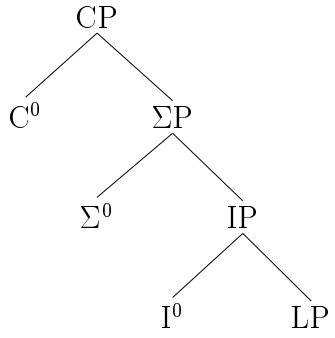
[9] With the allomorph *z*.

[10] Dobrovie-Sorin's (1999) proposal is similar in spirit, though it differs in theoretical assumptions.

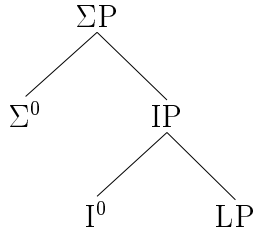
The syntactic placement of the clitics and the weak pronoun has to be 'local' in that they are normally close to the head, and they cannot appear outside their clause (they cannot be topicalized, for example). This is explained if their distribution is restricted to head-adjunction. The fact that they cannot be modified follows from the fact that they do not head a phrasal projection. C&S claim that weak and clitic pronouns cannot be conjoined. Under the account outlined here, that would follow from a parameterized constraint against coordinating non-projecting words. Some clitics (the Olang Tirolese *s*, for example) cannot be clause-initial, although strong and weak pronouns can. This can easliy be explained if we assume that those pronouns are phonologically dependent on a word on their left. Finally, C&S point out that clitics can never be stressed, whereas weak and strong pronouns can. This is what we predict under the partition in (3.20): the weak and the strong pronouns are independent phonological entities and can therefore carry stress.

C&S (1999) propose that the difference is structural: the strong pronouns are full nominal projections (which means they are embedded in three functional projections, as in (3.21a)); the weak pronouns lack the highest functional projection (3.21b); and the clitic pronouns lack the two highest functional projections (3.21c):

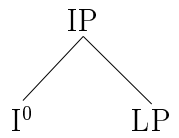
(3.21) (a) Strong pronouns



(b) Weak pronouns



(c) Clitic pronouns



The CP and IP are parallel but not identical to the functional projections of the VP. IP is a cover term for functional projections, Σ^0 holds the polarity and prosodic features, and C^0 hosts the case and referential information.

I have four reasons for preferring the analysis in (3.20) over the one in (3.21): First, the analysis in (3.20) is clearly simpler. Second, (3.20) straightforwardly captures the fact that there is a phonological difference between clitics on the one hand and weak and strong pronouns on the other (C&S and others point out that clitics are phonologically 'deficient'). Third, the analysis in (3.20) captures the fact that weak pronouns and clitics have head-like properties, whereas strong pronouns have phrasal properties. Fourth, the analysis in (3.21) is clearly incompatible with the LFG theory of c-structure, where empty structure is avoided (as will be discussed in detail in the next chapter; see also Bresnan 2001).[11]

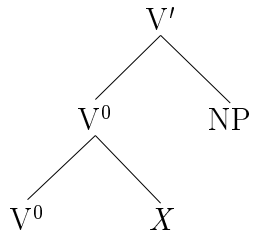
However, C&S argue convincingly that there are three kinds of pronouns. The two parameters argued for here (syntactic projectivity and phonological dependence) capture the differences between the three groups straightforwardly.

3.4 Summary

It was noted in the first two chapters that Swedish seems to have a special particle position, immediately preceding the direct object. Only members of a special class of words (often referred to as verbal particles) can appear in this position. It was also noted that this position is restricted to single words, which do not have complements or modifiers. The explanation offered was that some words are non-projecting, and the structure in (3.22) was proposed for Swedish:

[11] For discussion of various problems with C&S's (1999) analysis, see Bayer (1999), Diesing (1999), Dobrovie-Sorin (1999), Holmberg (1999) and Uriagereka (1999).

(3.22)



Clitics are often represented in the phrase-structure as non-projecting, head-adjoined structures, such as the structure we see in (3.22). However, the Swedish verbal particles are not prototypical clitics, since they are not phonologically dependent on another word. In this chapter, I have proposed a new way to look at clitics, as illustrated by the projection/dependence matrix in (3.5). I have argued that whether a word is phonologically dependent is orthogonal to whether it projects a phrase.

It has previously been pointed out that there is no precise, agreed-upon definition of what a clitic is. The projection/dependence matrix helps classify different types of words, some of which are 'cliticlike' and some of which are not. The non-projecting, phonologically dependent words are prototypical clitics. The non-projecting, phonologically independent words and the projecting, phonologically dependent words fall in between the prototypical clitics and completely independent words. Finally, the projecting, phonologically independent words share nothing in common with 'clitics'.

The new view of clitics advocated here can shed light on a generalization discovered by Cardinaletti and Starke (1996, 1999). They show that there are three different kinds of pronouns: strong, weak and clitic pronouns. The characteristics of each group are explained if we assume on the one hand that strong and weak pronouns are phonologically independent whereas clitics are dependent, and on the other hand that strong pronouns project phrases whereas weak pronouns and clitics do not.

Chapter 4

Phrase structure

4.1 Introduction

This chapter is concerned with the LFG c-structure theory in general, and non-projecting words within that theory in particular. C-structure representations in LFG are constrained by X′-theory (Chomsky 1970, Jackendoff 1977, Bresnan 1977, 1982a, 2001). In that sense, c-structure representations resemble the phrase structural representations of various other syntactic theories, for example Government and Binding Theory, some versions of the Minimalist Program, and the Optimality Theoretic syntax developed in Grimshaw (1997). The LFG c-structure represents the hierarchical organization within a sentence and also the linear order of constituents. One important feature of LFG is that it does not adopt any c-structure principle equivalent of the *Projection Principle* of Government and Binding Theory, and it is therefore not the case that the selectional restrictions of a verb need to be reflected in particular c-structure configurations.[1] Generalizations concerning thematic roles and grammatical functions are modelled in the argument structure and in the functional structure, respectively. The different levels are independent, though they are related through mapping principles. Given this general

[1] The Projection Principle ensures that lexical items appear in the necessary phrase structure positions (with respect to θ-marking, for example) at all levels of representation (D-Structure, S-structure, and LF, for GB). Chomsky's (1981:38) formulation is given in (i), where L_i and Lj are levels of phrase structural representation:
(i) If α selects[='θ-marks'] β in γ at L_i, then α selects β in γ at L_j.

architecture, it is possible that a given c-structure representation mirrors certain thematic properties of the head. However, this is an *indirect* consequence of the mapping between levels, since no c-structure principle says anything about thematic representations. For discussion and formalization of the different levels of syntax in LFG, as well as the mapping between those levels, see Bresnan (1982b, 2001), Kaplan and Bresnan (1982), Kaplan (1995), Falk (2000), Dalrymple et al. (1995), Sells (1985), and references cited in those works.

Since syntactic generalizations can be modelled on a-structure and f-structure as well as on c-structure, the burden on phrase structure in LFG is not as great as it is in some other theories. However, c-structure still hosts a lot of important information. In many languages, specific phrase structure positions are tied to given grammatical functions. For example, the specifier position of IP in English is associated with subjects. It is important to explore the nature of c-structure in order to understand its role in expressing grammatical relations, but also in order to understand how the superficial sentence structure is constrained.

This chapter describes and modifies the theory of c-structure in LFG. Bresnan (2001, chapter 6) formulates an X′-theory for LFG, and a large part of this chapter reviews the assumptions laid out and motivated there. Some aspects of the previous formulations are left unnecessarily vague, and this chapter makes the theory more specific and explicit.[2]

An important goal of this chapter is to make room for non-projecting words within the theory of phrase structure. In order to do so, I need to consider not only principles relevant for X′-structures, but also the inventory of syntactic categories. In addition, I will revise the principles which govern the mapping between functional and constituent structure.

[2] I indicate when I depart from Bresnan's assumptions. I do not review all of Bresnan's arguments and references.

4.2 X′-structure in LFG

Bresnan (2001:99) formulates the following endocentric constraints on phrase structure rules:

(4.1) (a) XP → X′, YP

(b) X′ → YP, X^0

In this text, I will follow Bresnan and make use of phrase structure rules as a convenient notation for constraints on structures. Note that these phrase structure rules are not meant to be rules generating structures, but rather constraints on possible structures. The rules in this chapter are intended as universal constraints on possible structures (schematic rules), and I will later make use of rules as constraints on language specific structures.

The schema in (4.1) dictates that each category will be realized in three levels. For example, V^0 projects a phrase V′, which projects a VP:

(4.2)

$$\begin{array}{c} \text{VP} \\ | \\ \text{V}' \\ | \\ \text{V}^0 \end{array}$$

An X^0 head shares properties with the phrasal category it projects.

It is commonly assumed that syntactic category labels such as N and V do not denote linguistic primitives. Bresnan (2001:100,120) assumes that the categories can be defined by the primitive features in (4.3):[3]

(4.3) **Kinds of categories:**

	'predicative'	'transitive'	
V	+	+	verbal
P	−	+	pre- or postpositional
N	−	−	nominal
A	+	−	adjectival

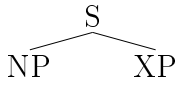
[3]Predicative categories require an external subject of predication, and transitive categories may take an object or a direct complement function (Bresnan 2001:120).

Since each head X^0 projects a phrase X', and each X' projects a phrase XP, X^0, X' and XP share the same predicative and transitive feature values.

The lexical categories (L) in (4.3), V, P, N, and A are adopted here (A can be an adjective or an adverb). In addition, we adopt the following inventory of functional categories (F): C ('complementizer'), I ('inflection'), and D ('determiner'), following Bresnan (2001:100).

This system looks very similar to other versions of X'-theory: we have the endocentric principles in (4.1) together with the classification in (4.3), with the added functional categories. There are also differences. First of all, LFG allows non-headed structures (we will see examples below). In addition, LFG allows for an exocentric and non-projective category S. The inclusion of S makes for a weaker theory, but its presence is supported by evidence from a large number of languages, such as Tagalog (Kroeger 1993), Warlpiri (Simpson 1991), and Wambaya (Nordlinger 1998) (see also Bresnan 2001 for discussion). S is a member of the inventory of universally available categories, but it does not conform to endocentric principles. S lacks a categorial head, and its syntactic category is thus not determined by that of its head. Although S is often appealed to in non-configurational languages, it can also dominate configurational structures.[4] Many languages have a subject-predicate construction like the one in (4.4), Welsh and Tagalog being examples (Kroeger 1993:11-12, Bresnan 2001, Sadler 1998a,b):

(4.4)



Configurational or not, S is not endocentric, since it lacks a categorial head.

Since LFG allows for non-headed structures and the category S, the endocentric principles in (4.1) cannot be absolute. That is, they cannot be postulated as unviolable, universal principles. Bresnan (2001) addresses the issue with an appeal to the notion of markedness:

[4] I assume the following definition of "configurational": A language is configurational if it has a VP, or some other projecting category distinguishing the subject position from the complement positions. For a thorough discussion of definitions of configurationality, see Nordlinger (1998).

> "Any c-structure pattern can be considered unmarked if it is an instantiation of these univeral endocentric constraint. By this means our theory allows the presence of marked constructions of irregular form and content alongside the instantiations of the universal endocentric patterns." (Bresnan 2001:101)

In Bresnan's system, structures that are in accordance with the endocentric principles need not be specified in a given language. A language only needs to specify the kinds of structures that override or add to the structures allowed by the universal principles. In that sense, less endocentric structures are marked.

The theory that will be developed here differs from that of Bresnan (2001) in that it does not make crucial use of the notion of markedness. Bresnan's theory allows structures which do not conform to her X′-theory, although such structures will be considered marked, whereas the present approach does not allow structures that violate X′-theory. Instead of calling the principles of X′-theory 'unmarked', I refer to them as universal, and universally available to the language learner. In this way, the theory of phrase structure constrains the inventory of language specific structures.

My proposal differs from Bresnan's in that the universal structures can be 'unlearned', based on positive evidence. I adopt the view that UG provides an initial state which is very rigid: all categories (functional and lexical) are available, and the phrase structure is fully configurational. I assume that no negative evidence is available to the child.[5] I also adopt the Subset Principle, which states that a child will opt for the most restrictive hypothesis possible, as long as this hypothesis accounts for the data.[6] Once the learner gets *positive evidence* that the present hypothesis is too restrictive, s/he loosens it up. I assume here that configurationality goes hand in hand with restrictiveness. The assumptions laid out above are compatible with views that are commonplace in generative grammar (Berwick 1985, Manzini and Wexler 1987, Wexler 1991, Marcus 1993, Hale and Reiss 1999, 2001, and references cited in those works). There is

[5]Negative evidence is taken to mean evidence which tells a child that a specific utterance is ungrammatical.

[6]The Subset Principle should not necessarily be interpreted as a principle of UG. The effect of the Subset Principle might follow from other aspects of acquisition, and the Subset Principle is then a descriptive generalization, rather than a principle.

much disagreement in the literature concerning these issues (for research that disputes aspects of these views include Bohannon and Stanowicz 1988, Morgan, Bonamo, and Travis 1995, Brent 1993, Pullum 1996, Seidenberg 1997, Lasnik (2000)). I therefore want to make clear that the model of X′-theory is not incompatible with other views of acquisition: my intent is only to show that the theory I develop does fit in with (what I perceive as) standard generative views.

Universal Grammar provides a few endocentric phrase structure principles, seven basic projecting syntactic categories, and the exocentric category S. These have been mentioned briefly above, but will be discussed in more detail in section 4.3 below. In addition, Universal Grammar provides a number of principles which constrain the c-structure to f-structure mapping (Bresnan 2001). These mapping principles will be discussed in section 4.4.

I assume that the language learner's initial hypothesis is that the grammar s/he is learning employs completely endocentric structures. The learner rejects this hypothesis only when direct evidence contradicts it. On the view adopted here, there are no 'unmarked' structures that do not need to be specified for a language. All the machinery needed for a given language is specified for that language. Some of the structure will be of the highly endocentric kind specified by UG, whereas other structures will be more permissive—they will ignore endocentricity and allow freer combinations of constituents. In other words, all structures can be seen as a 'subset' of what UG allows:

(4.5)

initial state	any one specific grammar
strictly endocentric phrase structure	may depart from endocentricity
all categories	a subset of the available categories, possibly S
mapping principles	the relevant mapping principles

The model outlined here makes non-configurationality the *marked* option in a sense. The learner initially attempts to assign a strictly configurational structure onto the linguistic string. Strict configurationality constrains the word order. Once it becomes clear through positive evidence that several word orders are allowed, the learner unlearns the strict configurationality and allows a freer, flatter structure. Note that if the

learner initially assumed a flat structure, no positive evidence would ever contradict that hypothesis.

Let us consider a concrete example: Imagine a language which has a VP which contains an object NP. The object must be adjacent to the verb. If a learner had assumed that there is no VP, and the object and the verb do not need to be adjacent s/he will never have been confronted with counterevidence to that. An object next to the verb would not contradict the child's initial hypothesis. In other words, if the child adopts a less restrictive hypotheis, no evidence will ever show that s/he is wrong.

In the learnability model that I have in mind, frequencies of occurrence of specific inputs is not significant.[7] However, many recent theories of learnability involve statistical information (see, e.g., Brent and Cartwright 1996, Seidenberg 1997, Christiansen and Curtin 1999, Boersma and Hayes 2001), and in such models, the advantage of a maximally restrictive initial state is not clear. However, I am not aware of any support for the claim that an unrestrictive initial state is superior. In either case, it is important to note that the the X′-theory laid out in this chapter is not dependent on any specific learning theory. The goal of the discussion above is simply to show that the theory laid out here is not problematic for orthodox views of acquisition.

4.3 Categories and X′-principles

Following Bresnan (2001), I adopt the structural constraints in (4.1), repeated here as (4.6):

(4.6) (a) $\mathrm{XP} \rightarrow \mathrm{X}', \mathrm{YP}^*$

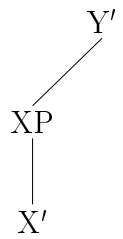
(b) $\mathrm{X}' \rightarrow \mathrm{X}^0, \mathrm{YP}^*$

I depart from Bresnan as to how the principles should be interpreted. In Bresnan's system, the constraints can be violated freely if they are contradicted by language specific constraints, or if they go against Economy (which will be discussed below). However, I hypothesize that they can be violated in one direction and not the other:

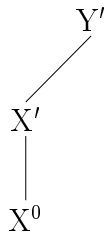
[7] Importantly, I assume that the learning strategy is *one-memory limited*; see Pinker (1984:31) and Osherson et al. (1982).

The X′-constraints are to be interpreted as contraints on *projections*. If an X^0 is present, it necessarily projects an X′, and if an X′ is present, it necessarily projects an XP. Moreover, an X^0 category can *only* project an X′, and an X′ can only project an XP. However, the presence of an XP does not entail the presence of an X′, and an X′ does not entail the presence of an X^0.[8] So, the structure in (4.7) is allowed (even if X′ does not dominate an X^0), but the structure in (4.8) is not:

(4.7)



(4.8) *



This will be discussed further in section 4.6.

The Kleene star is present, because it is assumed here that UG contains no binary branching requirement (this will be discussed further below).[9] Multiple specifiers might be ruled out by some independent constraint. We assume here that the learner assumes that all structure conforms to (4.6), until s/he is presented with evidence that contradicts that hypothesis.

The following syntactic categories are available (Bresnan 2001):

(4.9) F: C, I, D

L: V, A, P, N

[8] As we will see in section 4.6 below, an empty X^0 will be pruned away by Economy, even if an X′ is present.

[9] I use the Kleene star notation in (4.6), but since all nodes are optional in LFG, the Kleene plus notation could also be used.

The functional (F) and the lexical (L) categories cannot freely combine. Functional categories are often considered to be 'extensions' of lexical categories (Grimshaw 1991, 2000, Bresnan 1995, 2001). Following Bresnan (2001), I will use the term 'co-head' for such extended structures: if a c-structure node A maps into the same f-structure as a node B of a different category label, A and B are co-heads (annotated $\uparrow{=}\downarrow$). For example, if an auxiliary of category I^0 maps into the same f-structure as a verb of category V^0, they are co-heads. I propose that functional categories are constrained by the following principles as to what c-structure complements they can have as co-heads:

(4.10) **Constraints on co-heads:**

(a) $\mathrm{C}' \rightarrow \underset{\uparrow=\downarrow}{\mathrm{C}^0} \quad \underset{\uparrow=\downarrow}{\mathrm{IP}}$

(b) $\mathrm{I}' \rightarrow \underset{\uparrow=\downarrow}{\mathrm{I}^0} \quad \underset{\uparrow=\downarrow}{\mathrm{XP}}$

(c) $\mathrm{D}' \rightarrow \underset{\uparrow=\downarrow}{\mathrm{D}^0} \quad \underset{\uparrow=\downarrow}{\mathrm{NP}}$

The constraints in (4.10) do not force the presence of the functional categories CP, IP and DP, nor do they force those functional categories to have co-heads at all. The constraints in (4.10) specify all possible co-head combinations across categories.[10]

The restrictions in (4.10) leave us with very few possible co-head structures. When functional and lexical categories are co-heads, the functional category must always dominate the lexical XP. The mapping in (4.11a) is thus possible, but (4.11b) is not:

(4.11) (a) $\underset{\substack{\uparrow=\downarrow \\ \mathrm{NP}}}{\mathrm{D}'}$

(b) $\underset{\substack{\uparrow=\downarrow \\ \mathrm{DP}}}{\mathrm{N}'}$

[10] The constraints in (4.10) may ultimately be derivable from some specific theory of extended heads, but I will not take a stand here on what the details of such a theory would look like. For proposals and discussion, see Grimshaw (1991,2000) and Bresnan (1995,2001).

Furthermore, the co-head specifications do not allow a C^0 to take any co-head complement except IP, and D^0 can only take an NP co-head complement. There are also constraints on what specifiers functional categories can take. These constraints will be spelled out in connection with the discussion of mapping principles in section 4.4.

The categories in (4.9) are all projecting categories. In addition, the exocentric category S is available, but it will only be posited after a hypothesis involving an endocentric category has been rejected, as discussed in the previous section. Non-projecting categories are also allowed. A non-projecting category involves less endocentric structure and will only be posited if there is direct evidence for it. Again, the initial hypothesis is that a category conforms to (4.6). Recall the notational convention adopted here: projecting categories are represented as X^0 (X-zero), whereas non-projecting categories are X (p,ain X):

(4.12) X^0: V^0, P^0, A^0, N^0, C^0, I^0, D^0 **projecting categories**

X: V, P, A, N, C, I, D **non-projecting categories**

In addition to the structures in (4.6), I assume that the following adjunction structures are allowed:

(4.13) (a) $XP \rightarrow XP, YP^*$

(b) $X^0 \rightarrow X^0, Y^*$

Bresnan (2001:121) assumes the adjunction structures in (4.14):

(4.14) Bresnan (2001):

(a) $XP \rightarrow XP, YP$

(b) $X' \rightarrow X', YP$

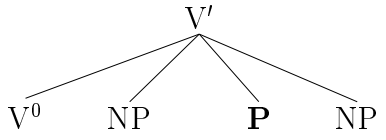
As we see, (4.13) and (4.14) both allow adjunction to XP. However, whereas Bresnan (2001) allows X′-adjunction, (4.13) does not (see Travis (1984) for evidence against X′-adjunction). Instead, (4.13) allows adjunction to X^0. Given only the possibility of the two adjunction structures in (4.13), the following generalization emerges:

(4.15) *Adjunction Identity:*
Same adjoins to same.

X^0 and X categories count as the same for adjunction: as far as projection is concerned, they are different, but they are identical in that they can directly dominate lexical material.

Why should the generalization in (4.15) be true? Or, more specifically relevant to the point at hand: why should (4.13b) be true? Something like (4.15) has been assumed across frameworks for a long time, implicitly or explicitly (see Platzack 1998 for an explicit discussion), so many linguists seem to share the intuition.[11] In chapter 3, we discussed phonologically deficient words, which need a phonological host. In parallel, it seems natural to think about non-projecting words as *syntactically* deficient words which need a syntactic host, as suggested by Joan Bresnan (p.c.). Strong empirical arguments for the existence of non-projecting words were offered in Chapter 2. However, why not assume that such words are simply adjoined at the X′-level? Non-projecting words gravitate towards head positions (the Swedish verbal particles provide a clear example of this), and I think this is what lies behind the intuition that many linguists share: they are head-adjoined. Postulating that X′-theory dictates non-projecting words to be head-adjoined is a very strong hypothesis. This position is of course empirically falsifiable, and future research will determine whether or not it is true. For example, if it is shown that structures like (4.16) exist, that would falsify the hypothesis that non-projecting words must be head-adjoined:

(4.16)

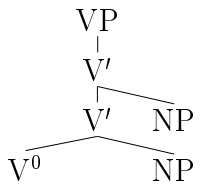


This prediction will be discussed further in chapter 7, since the English complex particle constructions could be taken as evidence that structures such as the one in (4.16) actually do exist.

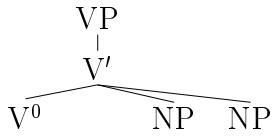
[11] See Sells (2000), van Riemsdijk (1999:19), Sadler (1998a,b), Keyser and Roeper (1992), Chomsky (1986), Jaeggli (1986), Pulleyblank (1986), and many others.

The Adjunction Identity hypophesis in (4.15) causes problems for a generalization which has been taken to be a fundamental principle by some researchers (see, ee e.g., Kayne (1984)): phrase structure should be binary branching. We know that certain heads may take more than one complement. Given the assumptions outlined so far, two possibilities emerge (with the additional assumption that complements are not immediate daughters of XPs, see the following section):

(4.17)



(4.18)



The structure in (4.17) obeys binary branching, but it does not obey (4.15), since an NP has adjoined to a bar-level category (V′). The structure in (4.18), however, is not binary branching, but it obeys (4.15).[12] Only the flatter structure in (4.18) is allowed under the present assumptions, whereas Bresnan's system allows both (4.17) and (4.18).

I do not know of any convincing empirical arguments for adopting binary branching as a basic principle of grammar. On the other hand, Travis (1984) and Jackendoff (1990a) present arguments against binary branching structures within the VP.[13] Binary branching is not generally taken to constrain c-structure in LFG, and I will not add (4.14b) to (4.13).

Note that Y^0 categories (that is, heads that *do* project) cannot adjoin; only Y (non-projecting) words are allowed to head-adjoin. This is because projecting words must

[12] I am ignoring here VP-shells as a possible structure for ditransitives (Larson 1988). Jackendoff (1990a) presents several arguments against Larson's VP-shells, and Jackendoff (2001a) argues against VP-shell treatment of the English verbal particles. See also Bresnan (1998, 2001), who shows that the binding data which Larson uses as evidence for his proposal is best treated with reference to linear order and hierarchical prominence. Note also that such structures lack motivation in a framework like LFG, where grammatical functions and theta-roles are not modelled primarily in the c-structure.

[13] And Barss and Lasnik (1986) provide arguments against the specific structure in (4.17).

be immediately dominated by an X′, which must be dominated by an XP, and XPs can only be adjoined to other XPs, not to X^0s. I assume that a word is marked in the lexicon for whether it projects or not; motivation for this is given in chapters 2 and 5. Consider the hypothetical lexical entries in (4.19-4.21):

(4.19) *back*: P^0 (↑ PRED)='back'
(↑ CASE)=OBL

(4.20) *back*: P (↑ PRED)='back'
(↑ CASE)=OBL

(4.21) *back*: $P^{(0)}$ (↑ PRED)='back'
(↑ CASE)=OBL

The lexical entry for 'back' in (4.19) is specified P^0 and cannot head-adjoin, but must project a phrase. The 'back' in (4.20) is specified P and cannot project a phrase, and must therefore head-adjoin. Both options are available for the 'back' in (4.21), with the notation $P^{(0)}$.

Let us take a look at some data that show that all three options (4.19-4.21) exist. There are clearly words that always project, and we have also seen examples of words which optionally project:

(4.22) (a) *Peter sparkade* **bort** *bollen.*
P. kicked away ball.the
'Peter kicked the ball away.'

(b) *Olle sparkade bollen längre bort.*
O. kicked ball.the further away
'Olle kicked the ball further away.'

Particles that can be modified and appear after the object optionally project. But are there words that *never* project? The answer is yes. The French 'clitic' pronouns mentioned in section 3.2.1 provide an example. They can never be conjoined, modified or stressed. And they can never appear in the normal, post-verbal object position. There are also a few Swedish particles which cannot be modified and can never appear

after the direct object (in the position for XP obliques and predicate complements). The particle *ihjäl* is an example (4.23):

(4.23) (a) *Han slog* **ihjäl** *en karl.*
he beat to.death a man
'He beat a man to death.' (PAR)

(b) **Han slog en karl ihjäl.*
he beat a man to.death

(c) **Han slog en karl helt ihjäl.*
he beat a man completely to.death

The word *ihjäl* can never project, and it must always be head-adjoined to the verb. Other examples include *an* 'on', *bi* 'by', and *ihåg* 'to mind' (Teleman et al. 1999: 417, Norén 1996).

4.4 C-structure to f-structure mappings

In LFG, grammatical functions are stated at f-structure. Bresnan (2001:97) develops the following classification of grammatical functions:[14]

(4.24) *argument functions:* SUBJ, OBJ, OBJ_θ, OBL_θ, COMPL
non-argument functions: TOP, FOC, ADJ

(4.25) *discourse functions:* TOP, FOC, SUBJ
non-discourse functions: OBJ, OBJ_θ, OBL_θ, COMPL, ADJ

In addition, Bresnan (2001) posits the following 'universal principles of endocentric structure-function association':

[14] COMPL designates the predicate complements COMP (which contains a subject) and XCOMP (which shares its subject with a higher clause).

(4.26) Bresnan (2001:102):

a. C-structure heads are f-structure heads.

b. Specifiers of functional categories are the grammaticalized discourse functions.

c. Complements of functional categories are f-structure co-heads.

d. Complements of lexical categories are the non-discourse argument functions.

e. Constituents adjoined to phrasal constituents are nonargument functions or not annotated.

Again, Bresnan defines these principles as being defaults, which can be overridden by language specific rules.

I will adopt principles (a), (b), (d), and (e) as they stand. Principle (a) ensures that a head in the c-structure is annotated with (↑=↓), and thus maps into the same f-structure as its mother. Principle (b) restricts the specifiers of functional categories to TOP, FOC and SUBJ. Note that the discourse functions are syntactic ('grammaticalized') entities, not discourse entities (see Bresnan 2001). Principle (d) restricts the complements of lexical categories to OBJ, OBJ_θ, OBL_θ and COMPL. Principle (e) states that a constituent adjoined to a phrasal constituent cannot be an argument funtion. However, it can be left unannotate (Bresnan (2001, chapter 9) gives motivation for the possibility of not annotating nodes).

Principle (c) will not be adopted as it stands. It is very similar to the co-head principles in (4.10), the difference being that the ones in (4.10) are more specific. The principles in (4.10) will replace (c).

The head-adjoined mapping possibilities (that is, the mapping possibilities of non-projecting words) are also restricted. I propose that the restrictions on what can adjoin to a lexical heads differ from the restrictions on what can adjoin to a functional head:

(4.27) *Non-projecting words:*

(a) Words adjoined to *lexical* heads are co-heads or argument functions.

(b) Words adjoined to *functional* heads are argument functions, or a non-argument non-discourse function (ADJ).

Only TOP and FOC are excluded from head-adjunction by (4.27). Examples we have already seen in sections 3.3-3.4 make it clear that non-projecting words can correspond to argument functions. In chapters 5 and 6, I will argue that the Swedish aspectual particles are co-heads.

We have not yet seen examples of non-projecting ADJUNCTS. Certain common English adverbs, such as *always* and *really*, might serve as examples. Other examples are the Swedish (modal) discourse particles *ju, väl* and *nog*. These words are traditionally referred to as particles, since they are short, unable to have modifiers or complements, and their syntactic distribution is different from that of other adverbials (Aijmer 1977, Platzack 1998). These particles are similar to the German *ja* and *doch*, and they are often described as 'pragmatic connectives' (Andersson 1975, Aijmer 1977).

The principles adopted here are repeated in (4.28):

(4.28) *Mapping principles:*

a. C-structure heads are f-structure heads.

b. Specifiers of functional categories are the grammaticalized discourse functions.

c. Complements of lexical categories are the non-discourse argument functions.

d. Constituents adjoined to phrasal constituents are nonargument functions or not annotated.

e. Words adjoined to *lexical* heads are co-heads or argument functions.

f. Words adjoined to *functional* heads are argument functions, or a non-argument non-discourse function (ADJ).

g. The following cross-categorial co-head combinations are allowed:

$$\begin{array}{lcll} C' & \rightarrow & C^0 & IP \\ & & \uparrow=\downarrow & \uparrow=\downarrow \\ I' & \rightarrow & I^0 & XP \\ & & \uparrow=\downarrow & \uparrow=\downarrow \\ D' & \rightarrow & D^0 & NP \\ & & \uparrow=\downarrow & \uparrow=\downarrow \end{array}$$

The principles are unidirectional: Specifiers of functional categories are necessarily TOP, FOC, or SUBJ. However, a grammaticalized discourse function is not necessarily a specifier; it can also be adjoined to some category. The principles are inviolable, in the sense that *if* the grammaticalized discourse functions are tied to a specific phrase-structural position in a language, that position will be a specifier of a functional category. Likewise, if the non-discourse argument functions are phrase-structurally defined, they will appear as complements of lexical categories. However, grammatical functions are not necessarily phrase-structurally defined.[15] In a language which has a non-configurational S, for example, the mapping principles are not applicable.

The mapping principles put very specific constraints on how c-structures map into f-structures. For example, the mapping principle (e) constrains the non-projecting words: words adjoined to heads cannot have a focus or topic function. Recall that non-projecting words are often called 'clitics' in the literature. It has often been noted that clitics cannot be topicalized or focussed, so the formulation of (e) seems to be correct.

Whether the mapping principles are adequate as they stand is an empirical question. if true counterexamples are found,[16] the exact formulation of the principle must be

[15]See Nordlinger 1998, Lee 1999, and Sharma 1999 for discussions of how morphological case markers can determine grammatical function.

[16]For example, Icelandic subjects can be sisters of V^0, according to some researchers (see Sells (2001), and also Rögnvaldsson (1984)). If this is indeed the correct analysis, it is a counterexample to mapping

modified until they correctly cover the cross-linguistic data.

4.5 Linear order

UG does not say anything about linear order. For notational convenience, I will sometimes conflate the ordering and the dominance generalizations within a specific language in a phrase structure rule by removing the comma. However, it should be understood that these two types of information are distinct (Falk 1983, Gazdar, Klein, Pullum and Sag 1985). When I discuss linear order specifically, I will use the following standard notation:

(4.29) SUBJ < OBJ

(4.29) should be read: 'the subject precedes the object'.

Even though UG does not involve specific constraints on how elements should be ordered, the nature of X′-theory itself limits the possible orderings. Consider an element X^0, which takes two complements. Assume that the complements are expressed by Y^0 and Z, where Y^0 projects but Z does not. Since Z must be head adjoined to X^0, we know that X^0 and Z must be adjacent. The possibilities are thereby restricted, no matter what the language particular ordering constraints are. In other words, a theory of hierarchical structure with restrictions on the way elements can be combined has indirect effects on the word order. The X′-principles together with the universal mapping principles thus influence patterns seen in word order cross-linguistically.

4.6 Economy of Expression

Many different theoretical frameworks assume a principle of *Economy*. Grimshaw (2001) discusses Economy in Optimality theory. Economy is also assumed in the Principles and Parameters framework (Chomsky 1989 and elsewhere).[17] Chomsky's version of

principle (c).

[17]See also Radford (1997), Cardinaletti and Starke (1999), Collins (1997), Fox (1999).

Economy is intended to constrain movement as well as structure, and it is of course the structure part that is most similar to the LFG version of Economy:

> "The analogous principle [analogous to economy of derivation - I.T.] for representation would stipulate that, just as there can be no superfluous steps in derivations, so there can be no superfluous symbols in representations. This is the intuitive content of the notion of Full Interpretation (FI), which holds that an element can appear in a representation only if it is properly 'licensed'." (Chomsky 1995:151)

The basic intuition behind FI is that every symbol in phrase structure must be semantically interpreted. As we will see, the Economy principle in LFG is quite similar in spirit to Economy in Principles and Parameters Theory.

The Economy principle is not usually motivated on empirical grounds. Instead, the motivation is philosophical: empty structure is seen as superfluous and inelegant. By Occam's Razor, unnecessary structure will be pruned away.

Bresnan posits the following formulation of Economy for LFG:

(4.30) **Economy of Expression** (Bresnan 2001:91)
All syntactic phrase structure nodes are optional and are not used unless required by independent principles (completeness, coherence, semantic expressivity).

So, the Economy principle basically says 'avoid structure', whereas the model outlined in this chapter says 'assume maximal structure', and this is a contradiction. I therefore propose the following reformulation of Economy of Expression, including an X′-clause:[18]

(4.31) **Economy of Expression** (preliminary version)
All syntactic phrase structure nodes are optional and are not used unless required by independent constraints (X′-constraints) or principles (completeness, coherence, semantic expressivity).

[18] The Economy principle will be further modified, and the final version is given in (4.38).

Completeness states that an f-structure must contain all the grammatical functions that the predicate requires. The subject node in the structural representation for *John walks* can therefore not be pruned away, since just *walks* does not provide the f-structure with the SUBJ function required by the predicate. *Coherence* states that only the grammatical functions required by the predicate can be contained in the f-structure for that predicate. This is why the structure **Linda sleeps Sarah* is not allowed: *sleep* does not require an OBJECT function. There is no opposition between coherence and Economy (both punish superfluous material). I therefore remove coherence from the formulation of Economy:

(4.32) **Economy of Expression** (pre-final version)
All syntactic phrase structure nodes are optional and are not used unless required by independent constraints (X′-constraints) or principles (completeness, semantic expressivity).

Let us now consider 'semantic expressivity', which is mentioned in the formulation of Economy in order to avoid ruling out sentences like (4.33):

(4.33) *John likes pretty flowers.*

Completeness refers to the arguments required by predicates. The verb *like* requires a subject and an object. Compare sentence (4.33) to (4.34), which involves less structure (is more economical), although it still obeys completeness:

(4.34) *John likes flowers.*

According to Bresnan (2001:91), the reason why (4.34) does not rule out (4.33) is that (4.33) adds the extra information that the flowers are pretty; in other words, (4.33) is more semantically expressive than (4.34).

However, Economy is in general only intended to target superfluous c-structure material: nodes are pruned away only if they are devoid of content. The statement in (4.35) makes explicit how Economy is restricted:

(4.35) Economy only holds over c-structures with identical f-structure, semantic interpretation, and lexical forms.

The restrictions in (4.35) should be interpreted in the following way: Economy does not have the power to change any information other than c-structure information.

It is now clear why *John likes pretty flowers* does not compete with *John likes flowers:* they have different semantic interpretation and involve different lexical forms. The f-structures also differ: compare (4.36), the f-structure corresponding to (4.33), to (4.37), the f-structure corresponding to (4.34):

(4.36)
$$\begin{bmatrix} \text{PRED} & \text{`like <(}\uparrow \text{SUBJ) (}\uparrow \text{OBJ)(}\uparrow \text{XCOMP)>'} \\ \text{TENSE} & \text{PRES} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{`John'} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{`flower'} \\ \text{NUM} & \text{PL} \end{bmatrix} \end{bmatrix}$$

(4.37)
$$\begin{bmatrix} \text{PRED} & \text{`like <(}\uparrow \text{SUBJ) (}\uparrow \text{OBJ)(}\uparrow \text{XCOMP)>'} \\ \text{TENSE} & \text{PRES} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{`John'} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{`flower'} \\ \text{NUM} & \text{PL} \\ \text{ADJ} & \{[\text{PRED} \quad \text{`pretty'}\ ]\ \} \end{bmatrix} \end{bmatrix}$$

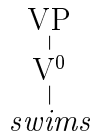
It is easy to see that (4.36) is less specific than (4.37), and (4.33) and (4.34) therefore do not compete under Economy. We then do not need to appeal to semantic expressivity to make sure that Economy does not rule out (4.33). Given (4.35), Economy can be stated as (4.38):

(4.38) **Economy of Expression** (final version)
All syntactic phrase structure nodes are optional and are not used unless required by X′-constraints or completeness.

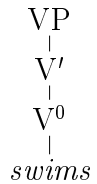
This Economy principle is formulated a bit differently from the one in Bresnan (2001), but it remains similar in spirit: extra structure is avoided.

As far as I can tell, the consequences are the same under both formulations of Economy, except for the fact that (4.38) cannot override X′-principles. The new version of Economy in (4.38) is in that sense less powerful than the old version, since (4.38) requires each structure to conform to the X′-constraints. Compare (4.39a) to (4.39b):

(4.39) (a)



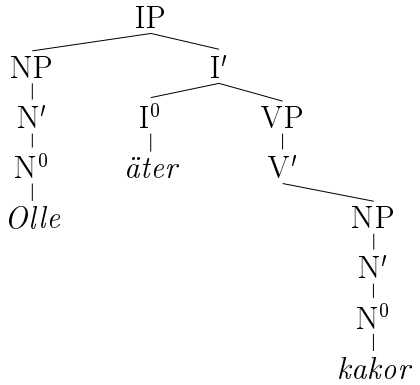
(b)



The old version of Economy would favor (4.39a), but the new version selects (4.39b).[19]

Let us consider a concrete example where Economy influences the structure of a given string of words. In V2 languages, the verb is situated in a functional projection outside the VP, but the object appears within the VP:

(4.40)



Olle äter kakor.
O. eats cookies
'Olle eats cookies.'

[19]Recall that X′-constraints are to be interpreted as contraints on *projections*: the presence of an X^0 entails the presence of an X′, but an X′ does not entail an X^0. Similarly, X′ necessarily projects an XP, but an XP does not necessarily dominate an X′ category. If there is no lexical head to fill X^0, it will be pruned away by Economy, even if an X′ is present, and if an X′ does not dominate anything, it will be pruned away.

There is no lexical material within the VP which requires the presence of V^0, so no V^0 node is present, by Economy.

Even though the new Economy principle is less powerful than the old one, it still has the effects which motivated the principle in the first place; for example, it disfavors empty categories. Empty categories are in principle allowed in LFG, but their use is highly restricted, as discussed in Bresnan 1998.[20] The Economy principle rules out empty categories if they are not needed by independent principles.

In the next chapter it will be shown that Economy plays an important role in the analysis of verbal particles. It was mentioned above that Economy is usually motivated on philosophical grounds, but we will see that the Swedish verbal particles provide actual empirical evidence for such a principle.

4.7 Summary of the c-structure theory

This chapter set out to establish an explicit theory of c-structure, which constrains the possible cross-linguistic structures. This can be compared to Bresnan's (2001) system, which allows any kind of structure to emerge in specific languages, under the label 'marked'.

An underlying assumption here is that UG provides a set of tools (categories, constraints and principles), and each grammar needs to conform to UG in the sense that it cannot contradict or add to the machinery provided. Some of the machinery can be unlearned in the following ways:

- A specific grammar can be less endocentric than, or equally endocentric as, UG.
- A specific grammar can have equally many or less categories than UG. Never more.
- A specific grammar can ignore one or more of the configurational mapping principles provided by UG. A language-specific phrase structure rule can never carry annotations that are not specified by the universal principles.

[20] Some versions of LFG do not allow empty categories at all (Dalrymple et al. 2001).

I will summarize the specific principles and constraints that were proposed above.

Constraints on X′-structures

Our X′-theory allows the following endocentric X′-structures:

(4.41) (a) XP → X′, YP*

(b) X′ → X^0, YP*

In addition, we allow the adjunction structures in (4.42):

(4.42) (a) XP → XP, YP*

(b) X^0 → X^0, Y*

Adjunction is not allowed at the X′-level.

Categories

The following categories are allowed:

(4.43) F: C, I, D

L: V, A, P, N

In addition, there is an exocentric, non-projecting category S.

C-structure to f-structure mappings

The structure-function mapping is constrained by the following principles:

(4.44) *Mapping principles:*

a. C-structure heads are f-structure heads.

b. Specifiers of functional categories are the grammaticalized discourse functions.

c. Complements of lexical categories are the non-discourse argument functions.

d. Constituents adjoined to phrasal constituents are optionally non-argument functions.

e. Words adjoined to *lexical* heads are co-heads or argument functions.

f. Words adjoined to *functional* heads are argument functions, or a non-argument non-discourse function (ADJ).

g. The following cross-categorial co-head combinations are allowed:

$$\begin{array}{lcll} C' & \rightarrow & C^0 & IP \\ & & \uparrow{=}\downarrow & \uparrow{=}\downarrow \\ I' & \rightarrow & I^0 & XP \\ & & \uparrow{=}\downarrow & \uparrow{=}\downarrow \\ D' & \rightarrow & D^0 & NP \\ & & \uparrow{=}\downarrow & \uparrow{=}\downarrow \end{array}$$

Economy

(4.45) *Economy of Expression*
All syntactic phrase structure nodes are optional and are not used unless required by X′-constraints or completeness.

Economy cannot affect any information external to the c-structure.

4.8 Non-projecting words in other frameworks

In chapter 2, I argued on empirical grounds that Swedish particles are best analyzed as non-projecting words in the syntax. In this chapter, I have discussed how such words can be incorporated into the X′-theory of LFG. However, since my conclusion that non-projecting words do exist was based on empirical evidence, it should hold true across theoretical frameworks. In this section, I provide brief discussions of two proposals which appeal to the possibility of allowing for non-projecting words in the phrase-structure. First, I will discuss Baltin's (1989) proposal, which is cast within Government and Binding theory. Then I discuss two Head-Driven Phrase Structure Grammar proposals: Sag's (1987) analysis of English verbal complements, and Abeillé and Godard's (2000) account of French complements. I will point to a few problems

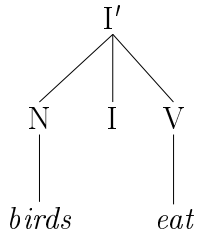
which have to be solved, but those problems do not seem insurmountable to me. In essence, then, the proposals by Baltin and Sag make it clear that it is in principle possible to appeal to non-projecting words also in frameworks other than LFG.

4.8.1 Principles and Parameters Theory: Baltin (1989)

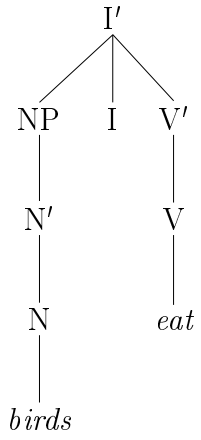
Baltin (1989) lays out a proposal cast in the Government-Binding theory of Chomsky (1981). He suggests that no superfluous non-branching structure occurs in a phrase-marker. In his system, the structure of (4.46) is (4.47) rather than (4.48):[21]

(4.46) *Birds eat*

(4.47)



(4.48)

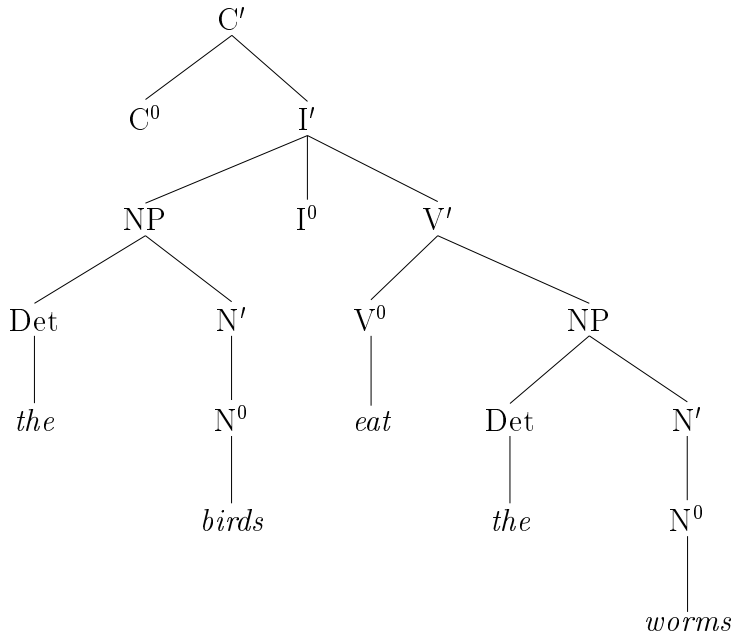


The structure of a sentence like (4.49), however, would be (4.50):

(4.49) *The birds eat the worms*

[21]Examples (4.46-4.50) are adapted from Baltin (1989:1).

(4.50)



The phrase structure trees in (4.47) and (4.50) would not be allowed by the LFG X′-theory outlined above. For example, there would be no I^0, since it is not filled with lexical material, and the N^0 and V^0 in (4.47) would necessarily be dominated by intermediate and maximal projections. Also, only words marked as such can be non-projecting. However, Baltin's theory and the theory outlined here are similar in one important respect: non-projecting words are allowed, and particles can be analyzed as such words.

Baltin makes several important assumptions. First of all, maximal projections only appear when they contain specifiers. Second, ordering restrictions are not stipulated. Instead, ordering restrictions are due to independent principles of the grammar. For example, NP objects must be immediately adjacent to the verb in English. This follows from the following theoretical assumptions:

(4.51)
- The Case Filter: a lexical N must receive Case.
- Case assignment takes place under government.
- In English, the Case assigner and Case assignee must be adjacent.

Baltin's definition of government goes as follows:

(4.52) A governs B if B is contained within the first maximal projection dominating A and A and B bear the same argument index.

A head indexes each of its complements.

Baltin rejects Emonds's (1972) idea of particle movement, although he adopts Emonds's proposal that particles are intransitive prepositions. Baltin assumes that unmodified intransitive prepositions are plain non-projecting Ps that are not governed by any ordering constraint (since such constraints do not exist). In GB, prepositions may assign Case. Baltin proposes that when particles intervene between the verb and the direct object, the particle (which is a preposition) assigns Case to the DO. When the particle is dominated by a maximal projection, as in *she threw the garbage right out*, the particle cannot assign Case to the object NP, since the DO is not contained within the first maximal projection (PP) that dominates P (by the definition of *government*). A modified particle cannot precede the object, since a full PP intervening between the verb and the object would block Case assignment from the verb (this follows from the adjacency requirement).

Although our proposals are cast within different frameworks, they are quite similar: our proposals both adopt the idea that syntactic structures are sometimes non-projecting, and that particles do not project phrases. My proposal differs from Baltin's in that I assume that particles are necessarily head-adjoined. Another important difference is that I assume that there are restrictions on word order that are independent of other syntactic principles. Baltin assumes no independent word order restrictions. Although the ordering relations between particles and direct object to some extent fall out of Baltin's independent syntactic principles,[22] the ordering of verbs and direct objects pose a problem. As far as I can tell, nothing in Baltin's account prevents verbs from following objects, just like (in his account) a non-projecting particle can precede or follow the object it case marks. This is not a desirable consequence, since (4.53) is ungrammatical in English:

(4.53) **Sam the ball kicked.*

[22]Although whether a non-projecting preposition follows or precedes the direct object is left undetermined.

A further problem is that Baltin's analysis will not extend easily to Swedish. First, not all intransitive prepositions can precede direct objects, (see examples (2.28-2.29)). Since prepositions can assign Case, and since intransitive prepositions do not project phrases, all intransitive prepositions should be able to precede direct objects, following Baltin's analysis. Second, particles (that is, non-projecting words) necessarily precede the object in Swedish (examples (2.6-2.10)). If there are no ordering restrictions, as Baltin proposes, the Swedish particles should also be able to *follow* the objects. Third, not all particles are prepositional in Swedish. As we saw in (2.1-2.4), adjectives, nouns and verbs can also be particles. However, nouns and adjectives cannot assign Case, so in a sentence like (4.54), the object NP is left without Case and should be ungrammatical:

(4.54) *Johan sparkade sönder leksaken.*
J. kicked broken toy.the
'Johan kicked the toy broken.'

Some of these problems are solved if we assume that there is no adjacency requirement for Case assignment in Swedish. But then we cannot explain why *only* particles (and not projecting PPs, for example) can precede the direct objects.

I will not discuss Baltin's proposal further here, since many aspects of the theory he adopts are no longer generally assumed within the Principles and Parameters framework.[23] However, I do want to note here that the attempt to do away with extra structure has recently been revived under the name Bare Phrase Structure (Chomsky 1994). Bare Phrase Structure is as of yet not a fully articulated theory, and I will therefore not discuss here what such an analysis would look like. I do want to note, however, that some of the basic ideas of that approach are compatible with my idea, given that non-projecting structure is allowed for (in fact favored) by Bare Phrase Structure. In constructing such a theory, the challenge will be to differentiate between projecting and non-projecting intransitive prepositions, keeping in mind that the difference between particles and other words is purely structural, separate from grammatical function or syntactic category.

[23]For example, the theory of Case assignment has been replaced by a theory of Case checking.

4.8.2 HPSG: Sag (1987) and Abeillé & Godard (2000)

This section discusses two Head-Driven Phrase Structure Grammar (HPSG) proposals which try to capture linguistic elements similar to the ones that I have discussed under the label 'non-projecting words'. The first proposal (Sag 1987) analyzes English verbal particles, whereas the second (Abeillé and Godard 2000) is concerned with verbal complements in French. HPSG does not have a separate level of c-structure and does not assume an X′-theory, so the formal analysis is necessarily quite different from the LFG analysis presented above.

Sag (1987)

Sag (1987) discusses the verbal particles in English within the theoretical framework of HPSG. HPSG does not adopt X′-theory. However, Sag uses a feature, LEX, which distinguishes between words and phrases. [LEX: +] refers to lexical categories, and [LEX:−] refers to nonlexical categories. Lexical forms are specified [LEX: +], and mother nodes of phrasal constituents are [LEX: −].[24] Sag also posits two linear precedence (LP) rules for English (1987:324):[25]

(4.55) LP1: HEAD[LEX: +] < {COMPLEMENTS, ADJUNCTS}
'Lexical heads must precede complements and adjuncts.'

LP2: COMPLEMENT[HEAD:[MAJ: ∼V]]<< X[LEX:−]
'All complements other than VPs and Ss must precede more oblique phrasal categories.'

The formulation of LP rules in (4.55) makes sure that the order of complements obeys the obliqueness hierarchy for phrases, but words (marked [LEX: +]) are exempt from this requirement.

Sag does not discuss the Swedish data, but his analysis could be extended to Swedish if we added the extra LP rule in (4.56):

[24] See also Sadler and Arnold (1994) for discussion of the [LEX] feature.

[25] The symbol < is used to denote linear precedence rules, regardless of the obliqueness hierarchy. The symbol << denotes *hierarchic* linear precedence rules: they require a constituent to precede another constituent only if the former is higher on the obliqueness hierarchy than the latter (less oblique than the latter) (Sag 1987:323).

(4.56) LP3: [LEX:+]<[LEX:−] (Swedish)

This rule is not an optimal solution, since Sag tries to appeal to the obliqueness hierarchy precisely in order to get away from rules such as the one in (4.56). However, it seems to me that it is necessary to posit a rule like (4.56) for a language like Swedish, where the particle always precedes the direct object.

Let us briefly consider the obliqueness hierarchy which Sag appeals to in order to capture the word order facts of English (1987:303):

(4.57) SUBJECTS > DIRECT OBJECTS > SECOND OBJECTS > NONARGUMENTS

Sag's appeal to the hiearachy is problematic, because of the way we determine where an element should be placed on the obliqueness hierarchy: the word order is supposed to be determined by the obliqueness hierarchy and this is specified on the SUBCAT list (the argument list of a lexical entry), but the way we determine the order of elements on the SUBCAT list is through the word order. This seems circular to me.

Consider (4.58-4.59) for illustration:

(4.58) *Mary sent the flowers out.*

(4.59) *Mary sent John out the flowers.*

In (4.58), the NP *the flowers* is a less oblique argument than the PP *out*, whereas in (4.59), the NP *the flowers* is a *more* oblique argument than *out*. As far as I can tell, the only way we can determine this is through the word order, which is supposed to be determined by the obliqueness hierarchy.

These are general issues that any theory of argument realization that appeals to the notion of obliqueness need to deal with, and not specific problems for Sag (1987) (see Rappaport Hovav and Levin (2000) for a survey and discussion of different hierarchy proposals). The main point here is that Sag's analysis shows that it is in principle possible to appeal to non-projecting words within HPSG.

Abeillé and Godard (2000)

Abeillé and Godard (2000) (henceforth A&G) introduce a two-value feature WEIGHT, with the features *lite* and *non-lite*. I will present some of their data and main conclusions below, and then I will show that the words that they call *lite* can be thought of as non-projecting.

A&G discuss word order in French. They note that complements in French are not in general ordered with respect to each other:[26]

(4.60) (a) *Paul donne un livre à son fils/ donne à son fils un livre.*
P. gives a book to his son to his son a book
'Paul gives a book to his son.'

(b) *Cette musique rend mon fils fou de joie/ rend fou de joie mon fils.*
this music makes my son crazy of joy makes crazy of joy my son
'This makes my son really happy.'

However, bare common nouns must precede phrasal complements:

(4.61) (a) *La course donne soif à Jean/ * donne á Jean soif.*
the race gives thirst to J. gives to J. thirst
'The race makes Jean thirsty.'

(b) *Ce livre fait plaisir à Marie/ * fait à Marie plaisir.*
this book makes pleasure to M. makes to M. pleasure
'This book gives Marie pleasure.'

If we add material to the bare noun, the ordering is free. This is illustrated in (4.62). Example (4.62a) includes a determiner, (4.62b) includes a complement, in (4.62c), the noun is modified, and in (4.62d), the noun is conjoined with another noun:

(4.62) (a) *La course donne [une grande soif] à Jean/ donne à Jean [une grande soif].*
the race gives a great thirst to J. gives to J a great thirst
'The race makes Jean very thirsty.'

[26] All the examples in this section are adapted from Abeillé and Godard (2000). I have added word-by-word glosses.

(b) *Ce livre fait [le plaisir de sa vie] à Marie/ fait à Marie [le plaisir de sa vie].*
this book makes the pleasure of her life to M. makes to M. the pleasure of her life
'This book gives the pleasure of her life to Marie.'

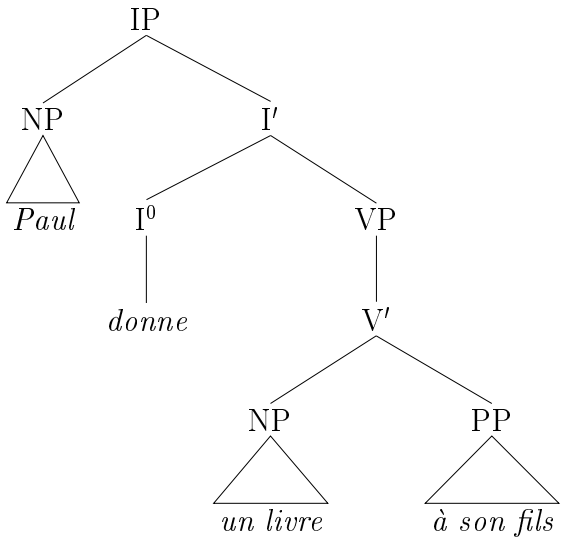
(c) *La course donne [vraiment soif] à Jean/ donne à Jean [vraiment soif].*
the race gives really thirst to J. gives to J. really thirst
'The race makes Jean really thirsty.'

(d) *La vitesse fait [peur et plaisir] à Marie/ fait à Marie [peur et plaisir].*
the speed makes fear and pleasure to M. makes to M. fear and pleasure
'Speed gives Marie fear and pleasure.'

A&G propose that the bare nouns in (4.61) are *lite*, whereas all the complements in (4.60) and (4.62) are *nonlite*.

The parallel between A&Gs proposal and my proposal is obvious: ge both recognize the difference between full-fledged phrases and smaller elements. A&G assume that the difference lie in a [WEIGHT] feature, whereas I attribute the difference to whether or not a word projects a phrase. A&G note that *lite* complements must precede *nonlite* complements. They get this through an ordering constraint requiring *lite* elements to precede *nonlite elements*. In my account, the ordering of elements is explained by the fact that non-projecting words must head adjoin. Compare the structures in (4.63), where (4.63a) corresponds to (4.60a), and (4.63b) corresponds to (4.61a):

(4.63) (a)



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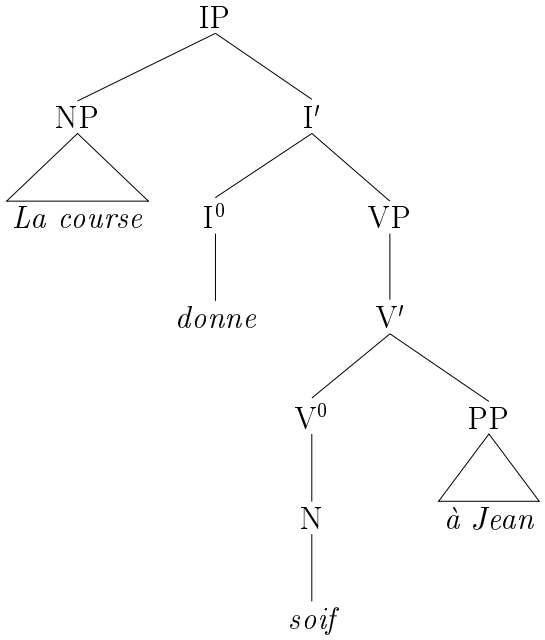


Ordering restrictions hold within V^0: the verb precedes other material, if present (following Pollock (1989), I assume that the tensed verbal element is hosted by I^0). V^0 must precede the verbal complements, which are not ordered with respect to each other. These restrictions, together with the assumption that *'lite'* eleeents are head-adjoined, get the correct ordering generalizations: verb–*lite*–*nonlite*.

A&G conclude that there is a "*lite* cluster around the head" (2000:354). Under their assumptions, this is an arbitrary fact. Their formalism could just as well express the opposite generalization: it would not be surprising if *lite* elements appeared as far away from the head as possible. On the X′-account adopted here, this is not accidental: non-projecting words are adjacent to the head because they must be head-adjoined.

4.9 Conclusion

The basic idea argued for in chapters 1-3 is very simple: some syntactically independent (i.e., not morphologically bound) words do not project phrases. We need to make room for such words in our theory of phrase structure. The X′-theory that I have presented in this chapter allows for non-projecting words in the syntax, but it also restricts the distribution of such words: they must be adjoined to a head.

Many of the assumptions laid out here are directly imported from the theory of phrase structure developed in Bresnan (2001). However, there are some differences, the main difference being that the present theory is more restrictive than the theory of Bresnan (2001). Bresnan allows for a language to employ *any* type of structure, although certain structures will be considered 'marked'. The new X′-theory makes clearer predictions, and is therefore easier to test empirically.

This chapter focussed on the specific theory of phrase structure that is assumed within LFG. The idea that non-projecting words exist has been explored in other theories of phrase structure as well, as we saw in section 4.8. However, the proposals discussed in that section involve making assumptions that are unconventional within their respective framework. The verbal particles and other *lite* categories (to use Abeillé and Godard's term) call for an analysis where the c-structure is thought of as a separate level of grammar, not dependent on semantic notions, or grammatical functions. This is natural in the LFG architecture of grammar, but not so natural in other frameworks. In Principles and Parameters, information about syntactic categories, grammatical function, thematic roles, and semantic relations are all expressed in tree-configurational terms, so it is difficult to tease apart facts that hold only with respect to one type of linguistic information. HPSG also conflates syntactic and semantic information, and

constituent structure is not recognized as an independent level of representation. We can conclude that it is indeed possible to appeal to (some form of) non-projecting words across frameworks. However, the multi-structure architecture of LFG syntax is particularly well-suited for separating out information relevant only at one level: in this case, the c-structure level.

Chapter 5

The Swedish VP

This chapter discusses Swedish VP-internal syntax, with a focus on verbal particles, and I will show that Swedish is easily accounted for within the theory laid out in the previous chapter. The ordering of the particles in relation to the VP-internal XPs follow straightforwardly from the assumption that the particles are head-adjoined to V^0. Sections 5.1 and 5.2 lay out the c-structure specifications, the lexical specifications and the c- to f-structure mapping principles for the Swedish VP. Section 5.3 presents evidence that the particles are attached at the V^0 (and not the V') level. Section 5.4 addresses the possibility of recursion and the appearance of multiple particles. Finally, section 5.5 discusses the notion of Economy, which will be shown to play an important role in the analysis.

5.1 The c-structure

Swedish particles are adjoined to V^0 by the language specific constraint in (5.1):[1]

(5.1) $V^0 \rightarrow V^0$ X
where X = a lexical category

By Economy of Expression, a V^0 node which does not contain lexical material will not be present. The VP-internal structures of the sentences in (5.2) are thus (5.3). Recall

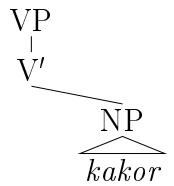
[1] Recall that the linear order generalizations can be separated from the dominance relations, although the two are conflated here.

from section 1.2 that *inte* and *ofta* mark the left edge of the VP:

(5.2) (a) *Daniel äter inte* [$_{VP}$ *kakor].*
D. eats not cookies
'Daniel doesn't eat cookies.'

(b) *Sofia kastar ofta* [$_{VP}$ **bort** *saker].*
S. throws often away things
'Sofia often throw things away.'

(5.3) (a)



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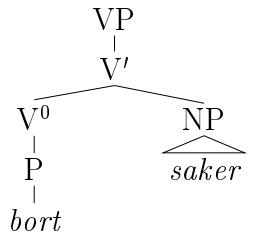


By (5.1), a particle is adoined to V^0. Particles thereby force a V^0 node. This is true even when there is no pre-terminal V^0 filled with lexical material, as in (5.3b). In this case, the particle is not strictly speaking *adjoined* to, but rather *attached* to V^0. However, for the sake of simplicity, I will keep referring to this as V^0-adjunction.

The rule in (5.1) specifically singles out V^0-adjunction. The particle in (5.2b) can therefore not adjoin to C^0 or I^0, even if the verb is hosted by one of those nodes. The example in (5.4) is therefore ruled out:

(5.4) **Sofia kastar* **bort** *ofta* [$_{VP}$ *saker*].
S. throws away ofta things

Any lexical category (not just prepositions) can adjoin to V^0. This was illustrated in examples (2.1-2.4), and some more examples are given in (5.5-5.8):

(5.5) **Preposition:**

Torsten	*slog*	**i**	*champagne*	*i*	*glasen.*
T.	poured	in	champagne	in	glasses.the

'Torsten poured champagne into the glasses.' (PAR)

(5.6) **Adjective:**

...	*tvåårige*	*Adrian*	*fick*	*riva*	**sönder**	*det*	*silverfärgade*	*bandet.*
	two-year-old	Adrian	got	rip	broken	the	silver.colored	ribbon

'...the two-year-old Adrian got to rip the silver-colored ribbon.' (PAR)

(5.7) **Noun:**

Fem	*av*	*föräldrarna*	*höll*	**tal**.
five	of	parents.the	held	speech

'Five of the parents made a speech.' (PAR)

(5.8) **Verb:**

Gamle	*farbror*	*Adrian*	*lät*	**bygga**	*den*	*lilla*	*villan.*
old	uncle	A.	let	build	the	little	house

'Old uncle Adrian had the little house built.' (PAR)

The examples above contain particles of four syntactic categories. Prepositional and adjectival particles have been discussed in some detail in the preceding chapters (and see also chapter 7). We have not, however, devoted much attention to the non-projecting nouns and verbs which appear in the particle position.

How do we know that *tal* in (5.7) is a particle? Why not simply treat it as a normal object NP? The reason why these nouns are generally considered particles is that they show the traditional particle properties. They bear the same stress, first of all. Second, they appear in the particle position. Third, they consist of a single word. Plain singular nouns such as *tal* in *hålla tal* (example 5.7) or *bil* in *köra bil* (example (2.4)) are not normally permitted in Swedish (or English):

(5.9) **Han älskar* **bil**.
he loves car

In order for (5.9) to be grammatical, we need to add an article, like *en* 'a', or a possessive pronoun, like *min* 'my'; or else we can pluralize the noun, *bilar* 'cars'. The 'bare' nature of the nouns exemplified in (5.7) and (2.4) is explained if we assume that they are particles; that is, non-projecting words. But if *bil* can be a particle, why is (5.9) ungrammatical? The occurrence of nominal particle seems to be highly restricted, and they do not seem to occur very frequently. Other examples include *köpa hus* 'buy house', *skaffa barn* 'get child', and the idiomatic *äga rum* 'happen' (literally: 'own room'). In all of these examples, the reading of the noun is highly generic, rather than specific. Consider (5.10):

(5.10) (a) *Lena höll* **tal** *på festen.*
L. held speech on party.the
'Lena spoke at the party.'

(b) *Lena höll ett tal på festen.*
L. held a speech at party.the
'Lena made a speech at the party.'

(c) *Lena höll flera tal på festen.*
L. held several speeches at party.the
'Lena made several speeches at the party.

Example (5.10a), where *tal* is a particle, makes it clear that Lena engaged in public speaking at the party, but leaves it vague whether she gave one or more speeches. Examples (5.10b-c), where *tal* is not a particle, are not left vague in that way. Let us consider one more example:

(5.11) *Kalle kan inte köra* **bil**.
K. can not drive car
'Kalle cannot drive.'

The example in (5.11) crucially means that Kalle cannot drive at all; it does not mean that there is one particular car that he cannot drive. The restrictions on nominal

particles brings to mind noun incorporation, which is characterized as follows by Mithun (1984):[2]

> "...a V stem and a N stem are combined to form an intransitive predicate denoting a unitary concept. The compound is more than a description; it is the name of an institutionalized activity or state. The IN [incorporated noun – I.T.] loses its individual salience both semantically and syntactically. It no longer refers to a specific entity; instead, it simply narrows the scope of the V. It is thus unaccompanied by markers of definiteness or number, or by demonstratives." (Mithun 1984:856)

It is striking that Mithun's description of noun incorporation seems to hold over the Swedish nominal particles as well: the verb and nominal particle together denote an institutionalized activity (such as *car-driving*, but not *car-loving*), and the particle is not marked for number or definiteness.[3] The two phenomena are clearly distinct, however, since the particle is not morphologically incorporated into the verb (see section 2.3).

Let us now turn to verbs which are particles. Taraldsen (1991) argues that the *la*-causative construction (of which (5.8) is an example) mirrors the verb-particle constructions in the Scandinavian languages. His main argument for this is that the verb which is the complement of the causative verb 'let' appears in the same position as the particle in each language. In Swedish, the infinitive precedes the direct object, in Danish it follows the object, and in Norwegian, its placement is optional. If Taraldsen is right, the infinitive should be treated as a non-projecting word, on a par with the prepositional particles. A piece of evidence that supports this assumption is the fact that the infinitive in the *la*-causative construction is necessarily a plain infinitive, and cannot appear with the infinitive marker *att*:

(5.12) *Gamle farbror Adrian lät (*att) bygga den lilla villan.*
old uncle A. let to build the little house

I adopt the traditional assumption that verbal and nominal elements such as the ones discussed above are particles. However, I want to point out that this is an area of

[2]The quote refers specifically to Mithun's noun incorporation of type I.

[3]See Asudeh and Mikkelsen (2000) for a discussion of a similar phenomenon in Danish. Although the Danish facts are not identical to Swedish, there are many interesting similarities.

Swedish grammar that has not received much attention, and further research needs to be done. I also want to note that it is not crucial for my analysis that the verbs and nouns be considered particles. I propose that Swedish verbal particles are non-projecting words that are head-adjoined to the verb. If future research shows that the relevant nominal and verbal elements should not be analyzed in that way, that does not mean that my analysis is incorrect for prepositional and adjectival particles.

Above, I have laid out arguments which indicate that it is possible for a word of any lexical category to be non-projecting. However, it is not the case that all words are optionally non-projecting. For example, it is *possible* for a preposition to not project, but it is not the case that all prepositions can have that structual realization. Compare (5.13), which contains non-projecting secondary predicates to (5.14) where the secondary predicates project phrases:

(5.13) (a) *Jonas lade (**dit**) boken (*dit).*
J. lay there book.the there
'Jonas put the book there.'

(b) *Olle sparkade (**ihjäl**) ormen (*ihjäl).*
O. kicked to.death snake.the to.death
'Olle kicked the snake to death.'

(5.14) (a) *Jonas lade (*där) boken (där).*
J. put there book.the there
'Jonas put the book there.'

(b) *Olle sparkade (*blodig) ormen (blodig).*
O. kicked bloody snake.the bloody
'Olle kicked the snake bloody.'

The (partial) lexical representations for *dit, där, ihjäl* and *blodig* are given in (5.15):

(5.15) (a) *dit*: $P^{(0)}$ (↑ PRED)='there'
(↑ CASE)=OBL_{dir}

(b) *där*: P^{0} (↑ PRED)='there'
(↑ CASE)=OBL_{loc}

(c) *ihjäl*: A (↑ PRED)='dead'

(d) *blodig*: A^0 (↑ PRED)='bloody'

The word *ihjäl* never projects, and the words *där* and *blodig* always project full phrases. The word *dit*, on the other hand, sometimes projects a phrase and sometimes it does not. In (5.16), it is modified and projects a full phrase:

(5.16) *Alexander offrade där till gudarna, de trofasta grekiska gudarna*
A. sacrificed there to gods.the, the faithful Greek gods
som hade fört dem [$_{PP}$ ända dit].
who had brought them all.the.way there
'Alexander made offerings to the gods there, the faithful Greek gods, that had brought them all the way there.' (PAR)

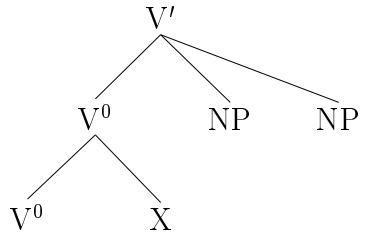
Words like *dit* which optionally project will be discussed further in section 5.5 below.

Let us now turn to phrases with more than one object. The rule in (5.17) constrains the distribution of verbal (V′) complements:

(5.17) $V' \rightarrow V^0 \quad NP \quad NP \quad XP$

The combination of (5.17) and (5.1) allows the following structure in Swedish:

(5.18)



The structure in (5.18) would be a particle cooccurring with two objects. Swedish indeed allows for such phrases. Examples adapted from Teleman et al. (1999) are given in (5.19):

(5.19) (a) *sätta* **på** *barnen* *varma* *tröjor*
set on.PRT children.the warm sweaters.the
'put warm sweaters on the children'

(b) *kasta* **av** *sig* *kläderna*
throw off.PRT SIG clothes.the
'throw one's clothes off'

(c) *ta* **ifrån** *eleven* *pennan*
take from.PRT student.the pen.the
'take the pen from the student'

(d) *säga* **till** *personalen* *att* *komma*
say to.PRT staff.the to come
'tell the staff to come'

There are several facts which show that *på, av, ifrån* and *till* in (5.19) are particles and not prepositions. First, they are stressed, just like regular particles. Prepositional intonation is impossible. Second, the double NPs in phrases like (5.19) can alternate with NP-PP structures, just like regular double NPs, and the particle is unaffected. The examples in (5.20) show the NP-NP/NP-PP alternation with double object verbs without particles, and the examples in (5.21-5.22) show that double object constructions with particles behave the same way:

(5.20) (a) *John* *gav* *flickan* *pengarna.*
J. gave girl.the money.the
'John gave the girl the money.'

(b) *John* *gav* *pengarna* *åt* *flickan.*
J. gave money.the to girl.the
'John gave the money to the girl.'

(5.21) (a) *Maria* *satte* **på** *pojken* *kläderna.*
M. put on boy.the clothes.the
'Maria put the clothes on the boy.'

(b) *Maria* *satte* **på** *kläderna* *på* *pojken.*
M. set on clothes.the on boy.the
'Maria put the clothes on the boy.'

(5.22) (a) *Hunden sliter* **av** *husse mössan.*
dog.the tears off dog.owner hat.the
'The dog tears the hat off of the dog owner.'

(b) *... och slita* **av** *mössan på husse.*
and tear off hat.the on dog.owner
'...and tear the hat off of the dog owner.' (PAR)

Third, particles in double object constructions behave like normal particles in that they prefix to the verbal adjective in adjectival passive formations:

(5.23) (a) *Dom tog* **ifrån** *fången friheten.*
they took from prisoner.the freedom.the
'They deprived the prisoner of his freedom.'

(b) *Fången blev* **ifrån***tagen friheten.*
prisoner.the was from.taken freedom.the
'The prisoner was deprived of his freedom.'

The examples above show that particles can indeed cooccur with double NP objects.

5.2 The structure-function mapping

This section briefly outlines the structure-function mapping within the Swedish VP. Further discussion, examples, and motivation for the annotation of the particles will be given in chapter 7. The annotated V′ rule in Swedish is (5.24):

(5.24) $$\begin{array}{lcccc} V' & \rightarrow & V^0 & NP & NP \quad XP \\ & & \uparrow{=}\downarrow & (\uparrow \text{OBJ}){=}\downarrow & (\uparrow \text{OBJ}_\theta){=}\downarrow \end{array}$$

The V^0 head is annotated ↑=↓ by the mapping principle in (4.28a). The category and the function of the XP will depend on the lexical specification of the verbal head, and the mapping principle (4.28c), which states that complements of lexical categories are non-discourse argument functions.

The phrase-structure rule in (5.1) was left unannotated. The annotated version is given in (5.25):

(5.25) $V^0 \rightarrow \begin{array}{cc} V^0 & X \\ \uparrow=\downarrow & \uparrow=\downarrow \\ & \vee\ (\uparrow \textsc{xcomp})=\downarrow \end{array}$

Resultative particles are annotated $(\uparrow \textsc{xcomp})=\downarrow$, and aspectual particles are annotated $\uparrow=\downarrow$, as will be discussed in chapter 6.[4]

I assume that the non-projecting nouns and verbs form *complex predicates* with the verbal head, and are annotated $\uparrow=\downarrow$. Consider the examples in (5.26), where (5.26a) is a noun and (5.26b) is a verb:

(5.26) (a) *Mamma kör ofta* **bil**.
mom drives often car
'Mom often drives (cars).'

(b) *Lisa lät* **riva** *garaget.*
L. let tear garage.the
'Lisa had the garage torn down.'

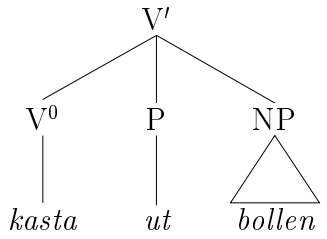
The expressions *köra bil* and *låta riva* are of course complex predicates of different types: (5.26a) resembles noun incorporation (as discussed above), whereas (5.26b) is a causative. For discussions of complex predicates in LFG, see Matsumoto (1996), Butt (1995), Andrews and Manning (1999), Ackerman and Webelhuth (1998), Webelhuth and Ackerman (2001), and for analyses of causatives, see Matsumoto (1996) and Alsina (1996).

5.3 Head-adjunction

We now return to the claim that the verbal particles are head-adjoined to V^0. Most data that we have seen so far is compatible with both structures in (5.27):

[4] I treat all predicative particles as XCOMPs. Another possibility is that the adjectival particles are XCOMPs and the prepositional ones are obliques. The predicative status of the prepositional particels would then be modelled in the semantics only, and not in the syntax. For a discussion of phrasal XCOMPs and obliques, see Bresnan (2001, Chapter 12).

(5.27) (a)



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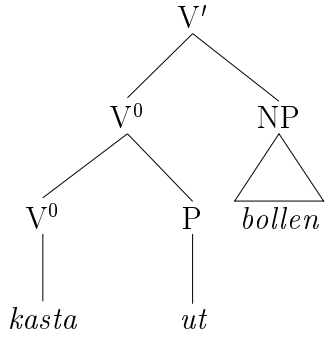


This section presents data supporting the structure in (5.27b): the verb and the particle form a constitent which excludes the NP object.

5.3.1 Topicalization

Topicalization is normally considered a solid constituency-test: only constituents can appear in the topic position. This section will show that topicalization data support the structural representation in (5.27b) above, but let me first briefly present some facts concerning VP-topicalization in Swedish.

When a VP is topicalized in Swedish, an auxiliary verb *göra* 'to do' is necessary, even though Swedish does not normally have English-style *do*-support:

(5.28) (a) *Tappar humöret gör han bara om han inte får mat.*
loses temper.the does he only if he not gets food
'Lose his temper he only does if he doesn't get food.' (PAR)

(b) *Trivs i studion gör han dock.*
likes.it in studio.the does he however
'He does, however, enjoy himself in the studio.' (PAR)

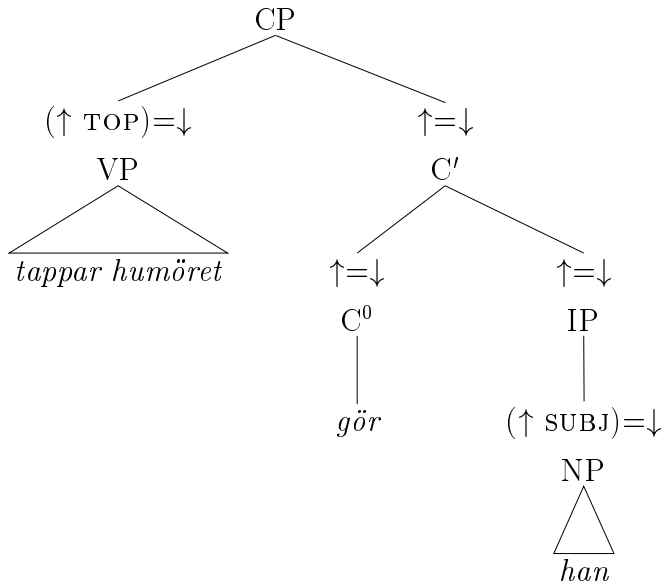
(c) *... erkände den gjorde hon inte.*
admitted it did she not
'... admit it she did not. (PAR)

(d) *Men applåderade gjorde vi ändå.*
but applauded did we anyway.
'But applaud we did anyway.' (PAR)

Note that both the auxiliary and the topicalized verb is tense-marked in Swedish, although only the auxiliary verb is tensed in English. Tensed verbs normally appear in I^0 or C^0 in Swedish (section 1.2), but in topicalization structures, we find a tensed verb in V^0, like in subordinate clauses.[5] The structure I assume for a topicalized VP is given in (5.29); I illustrate using example (5.28a):

[5]It is clear that the topicalized VPs in (5.28) *are* indeed VPs, and not IPs, even though the verb is tensed. There are two facts that show this. First, the subject is in SpecIP, and it is not part of the topicalized structure. Second, the negation marks the left edge of the VP, and it is left behind (as we see in (5.28c)).

(5.29)



The topicalized phrase is a specifier of CP, the auxiliary verb is a C^0, and the subject is a specifier of IP.

Let us now turn to data that involve particles. Many speakers only allow topicalization of a full VP. However, some speakers allow topicalization of a verb and a particle together, as shown in (5.30), which corresponds to (5.31):

(5.30) (a) *%Sköt* **ner** *gjorde hon* [$_{VP}$ *alla fienderna].*
shot down did she all enemies.the
'Shoot down she did all the enemies.'

(b) *%Åt* **upp** *gjorde hon* [$_{VP}$ *hela kakan].*
ate up did she whole cake.the
'Ate up she did the whole cake.'

(5.31) (a) *Hon skjöt* **ner** *alla fienderna.*
she shot down all enemies.the
'She shot down all the enemies.'

(b) *Hon åt* **upp** *hela kakan.*
she ate up whole cake.the
'She finished the whole cake.'

In (5.30), the object NP appears in its normal VP-internal position, although the verb and the particle are topicalized. This fact would be difficult to explain if we assumed

a flat structure such as that in (5.27a) where the verb and the particle do not form a consituent, whereas it is natural if the verb is head-adjoined to V^0, as in (5.27b).

For some speakers, the verb can be topicalized alone if no particle is present (5.32), but a verb cannot be topicalized if a particle remains in the VP (5.33)

(5.32) (a) %*Sköt gjorde hon* [$_{VP}$ *alla fienderna].*
shot did she all enemies.the
'Shoot she did all the enemies.'

(b) %*Åt gjorde hon* [$_{VP}$ *hela kakan].*
ate did she whole cake.the
'Eat she did the whole cake.'

(5.33) (a) **Sköt gjorde hon* [$_{VP}$ **ner** *alla fienderna].*
shot did she down all enemies.the

(b) **Åt gjorde hon* [$_{VP}$ **upp** *hela kakan].*
ate did she up whole cake.the

If the verb and the particle did not form a constituent, the contrast between (5.32) and (5.33) would be difficult to explain. The generalization seems to be that all speakers can topicalize a full VP, some can topicalize a full V^0, but no one can topicalize only part of V^0. In other words: nobody can topicalize a non-constituent.

5.3.2 Coordination

The verb and the particle can be coordinated with other V^0s, as (5.34) shows:

(5.34) (a) *... den kvinna som björnen slagit* **ner** *och dödat i*
the woman that bear.the beaten down and killed in
dungen vid stranden.
grove.the by beach.the
'... the woman that the bear had beaten down and killed in the grove by the beach.' (PAR)

(b) *Genomsnittstiden för att visa* **upp** *och auktionera* **ut** *ett*
average.time.the for to show up and auction out an
objekt är en minut.
object is one minute.
'The average time it takes to show and auction out an object is one minute. (PAR)

(c) *En ny helig tjur i stället för den som perserna*
a new sacred bull in stead of that which Persians.the
påstods ha dödat, ätit **upp**, *och ersatt med en*
claimed.PASSIVE have killed, eaten up, and replaced with a
eländig åsna.
miserable donkey
'A new, sacred bull instead of the one that the Persians were claimed to have killed, eaten, and replaced with a miserable donkey.' (PAR)

(d) *IOK har tystat* **ner** *och begravt dopingfall tidigare.*
IOK has silenced down and buried doping.cases before
'IOK has silenced and buried doping cases before.' (PAR)

Given the standard assumption that only constituents can conjoin, the data in (5.34) shows that the verb and the particle are dominated by a V^0. Note that it is not possible to view the coordination in (5.34) as V′-conjunction, since the verbs share an object. The example in (5.35) makes it clear that is not the case that the object is misplaced by Right Node Raising:

(5.35) *Jag tycker att det är svårt att klä* **på** *och ta* **av** *honom*
I think that it is hard to dress on and take off him
kläderna.
clothes.the
'I think it is hard to dress and undress him.'

In (5.35), there are two objects that do not form a constituent, so they cannot have been raised together. The examples in this section thus show that the verb and particle combinations *klä på* and *ta av* form constituents to the exclusion of the other VP-internal phrases.

5.3.3 Summary

The X′-theory of the previous chapter allows non-projecting words to surface only if they are adjoined to a head. This claim was based the traditional assumption that categories can only adjoin to like categories. Since the Swedish verbal particles always appear immediately to the right of the verbal position within the VP, I proposed that the particle is right-adjoined to V^0. This section provided data from topicalization and coordination which support the claim that the verb and the particle form a constituent under V^0.

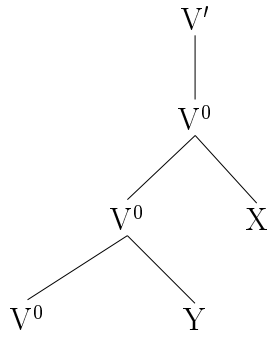
5.4 Recursion

Consider again the language-specific phrase structure rule which restricts the distribution of particles in Swedish:

(5.36)
$$\begin{array}{lcccc} V^0 & \rightarrow & V^0 & & X \\ & & \uparrow{=}\downarrow & & \uparrow{=}\downarrow \\ & & & \vee & (\uparrow \textsc{xcomp}){=}\downarrow \end{array}$$

Note that the rule in (5.36) is recursive, and thus allows Swedish to have structures such as (5.37):

(5.37)



It is important that our theory of phrase structure permits recursive head-adjunction, since we find such structures cross-linguistically. An example from a language other than Swedish comes from Sadler (2000), who shows that recursive head-adjunction occurs in Welsh. However, examples with more than one particle are not commonly found in

Swedish. This is because the grammatical functions of the particles are very limited: they are either co-heads or resultative predicates (as will be discussed in chapter 6). The fact that each clause only contains one resultative predicate follows from the principle of functional uniqueness. Two resultative particles in the same clause would contribute two values to the XCOMP attribute, in violation of the principle of functional uniquenes, which states that each attribute must have one unique value by functional uniqueness. The co-heads either form a kind of complex predicate (drive-car, let-build), or else they mark aspect. Two aspect markers cannot cooccur, because they would contribute conflicting aspectual features to the f-structure, as I will show in section 6.2.2. below.

However, it is not obvious why aspectual markers cannot cooccur with nominal particles:

(5.38) **Han körde* **på** *bil.*
he drove on car

The intended meaning of the example in (5.38) is something like 'he kept on driving', which seems semantically plausible, but the sentence is nonetheless ungrammatical. Note that (5.39) also is ungrammatical, even though (5.40-5.41) are both fine:[6]

(5.39) **Han körde* **på** *bilen.*
he drove on car.the

(5.40) *Han körde* **på**.
he drove on
'He kept driving.'

(5.41) *Han körde bilen.*
he drove car.the
'He drove the car.'

The example in (5.40) contains the aspectual particle *på*, and (5.41) contains a full NP object. The two cannot be combined, as we saw in (5.39). We obviously do not want our phrase structure principles to rule out (5.39), since there are plenty of grammatical

[6]The example in (5.39) is actually grammatical on the reading 'he hit the car (with another car)'. This is not the intended reading here.

sentences which include a particle and an object NP. It seems to be a general fact that aspectual *på* does not cooccur with a direct object. Interestingly, this is true for English aspectual *on* as well (Jackendoff 2001a).

Although semantic restrictions make them rare, there are examples of sentences with more than one particle:[7]

(5.42) *Sara* *lät* **bygga** **ut** *huset.*
S. let build.PRT out.PRT house.the
'Sara had the house made bigger.

(5.43) *Hon* *körde* **bil** **upp**.
she drove car.PRT up.PRT
'She drove up.'

Recall that an unmodified *upp* 'up' cannot head a PP in Swedish, and therefore it cannot follow a non-particle nominal (an NP):

(5.44) *Hon* *körde* *(**upp**)* *bilen* *(*upp).*
she drove (up) car.the (*up)
'She drove the car up.'

The contrast between (5.43) and (5.44) is telling: *upp* cannot appear after an NP, so we know that *bil* in (5.43) must be a particle. The examples in (5.42) and (5.43) both contain two particles, which shows that double particles are possible in Swedish, although they are rare.

5.5 Economy and Swedish clause structure

This section provides a discussion of a problem raised by the present analysis. We will see that the Economy principle, which is independently motivated on theoretical grounds, plays an important role in the solution to the problem. I then provide a general discussion of Economy in connection with Object Shift and verb-second phenomena in Swedish.

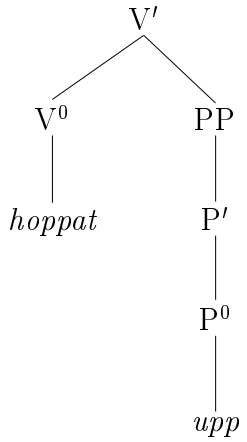
[7] If you think (5.43) sounds a bit odd, imagine it as a possible answer to the question 'How did she get up to your house?', talking to a person who lives on a hill.

5.5.1 Economy and Swedish particles

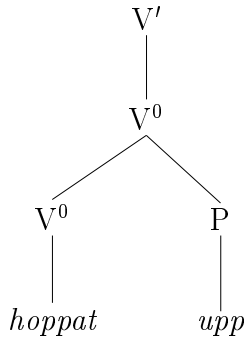
Some words, *dit* and *upp*, for example, optionally project a phrase. The VP of a sentence like the one in (5.45) should therefore have two possible realizations, (5.46a) and (5.46b):

(5.45) *Kalle hade hoppat upp.*
K. had jumped up
'Kalle had jumped up.'

(5.46) (a)



(b)



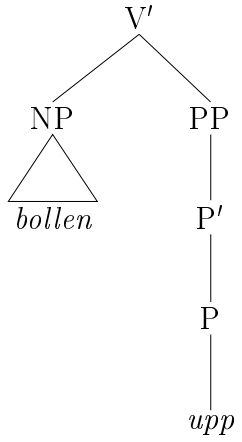
X′-theory does not predict which structure is correct, and neither do the lexical specifications for *upp*. However, consider again the Economy principle, repeated below as (5.47):

(5.47) **Economy of Expression**
All syntactic phrase structure nodes are optional and are not used unless required by X′-constraints or completeness.

Economy favors (5.46b) over (5.46a), since (5.46a) involves more structure.

The fact that Economy decides between the structures in (5.46) is arguably not very interesting, since the linguistic string is identical in both cases, and it is therefore difficult to determine which structure is correct. Let us therefore turn to transitive verbs, where the difference in structure makes a difference in word order. Consider the structures in (5.48), where *bollen* is an object and *upp* is an optionally projecting preposition:

(5.48) (a) *



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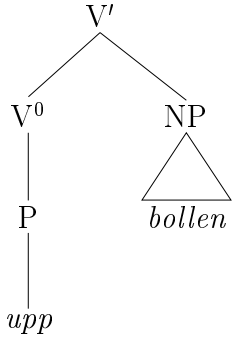


Economy favors the structure in (5.48b), and the object is therefore predicted to follow *upp* in the surface string. This is correct, as (5.49) shows:

(5.49) (a) *Jan sparkar upp bollen.*
J. kicks up ball.the
'Jan kicks the ball up.'

(b) **Jan sparkar bollen upp.*
L. kicks ball.the up

If we did not assume the Economy principle, the data in (5.49) would remain unexplained.

Note that Economy does not pose a problem for modified prepositions, since Economy only holds over structures which correspond to the same f-structure representations:

(5.50) *Jan sparkar bollen rakt upp.*
J. kicks ball.the straight up
Jan kicks the ball straight up.'

It is clear that *upp* in (5.50) projects a phrase since it follows the direct object *bollen*. However, no more Economical representation is possible, since *upp* is modified. A modified particle will never 'compete' with an unmodified one, since the input strings are not identical.

The data from the Swedish particles show that if all other things are equal, Economy favors non-projecting structures over projecting structures. The transitive structure in particular provide clear evidence that an Economy principle is warranted in the grammar.

5.5.2 Potential problems for Economy

As was discussed in chapter 4, the notion of Economy has been assumeds across frameworks for a long time. The Economy principle assumed here is a slightly modified version of *Economy of Expression* first introduced by Bresnan (1998) and developed further in Bresnan (2001); see the discussion in section 4.6. Even though Economy of Expression has been appealed to by several researchers since its original introduction, its consequences have not been fully explored. As we saw in the previous section, Economy potentially has great consequences. This section therefore considers Economy in connection with two areas of Swedish syntax that at first seem problematic.

Object shift

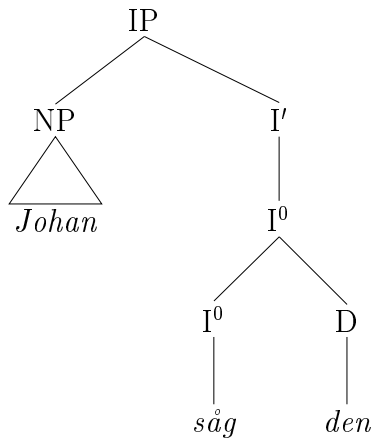
Pronominal objects sometimes appear outside the VP in Swedish. This phenomenon is called Object Shift and has received much attention in the syntax literature (see, e.g.,

Holmberg 1986, 1997, Josefsson 1992, Kaiser 1997, Sells 1998, 2001, Bobaljik 1999). An example is given in (5.51):

(5.51) *Johan* *såg* *den* *inte.*
J. saw it not
'Johan did not see it.'

Recall from section 1.2 that negation marks the left edge of the VP in Swedish. The example in (5.51) thus shows that the pronoun *henne* is situated somewhere to the left of VP. I will adopt the analysis of Object Shift proposed by Sells (2001). Under Sells's analysis, a sentence like (5.51) has the structure in (5.52):[8]

(5.52)



Note that Sells assumes that the pronoun is a non-projecting element, head-adjoined to I^0. This assumption is motivated in Sells, and it fits well with the view of non-projecting words presented here, since shifted pronouns do not take modifiers or complements.[9]

Some speakers also accept sentences where the pronoun has not undergone Object Shift, as in (5.53):

[8]A couple of notes about the structure in (5.52): First, I am not including *inte* in (5.52), as the c-structural representation of negation adds irrelevant complications, and touches on a controversial issue.

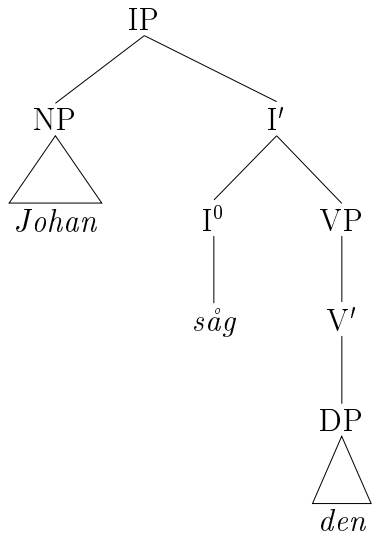
Second, Sells gives the pronoun the label Pro. I label it D, as I do not assume 'Pro' as a category. This choice of label has no significance for any of the points in this section.

[9]The facts concerning Object Shift in Icelandic are different in important ways. Crucially, the shifted object can be larger than one word. Icelandic must therefore receive a different analysis.

(5.53) *%Johan* *såg* *inte* *den.*
J. saw not it
'Johan did not see it.'

In (5.53), the object *den* follows the negation, and is thus included in the VP. Sells assumes the structure in (5.54) for sentences like (5.53):[10]

(5.54)



Comparing (5.52) and (5.54) reveals that the pronoun can appear as a non-projecting D under I^0 or as a projecting D^0 under V′. This is clearly problematic for Economy: (5.54) involves more structure than (5.52). (5.52) should therefore block (5.54). Note that hypothesizing that the VP-internal pronoun in (5.54) is adjoined to V^0 will not solve the Economy problem: the structure would still be less Economical than (5.52), since the V^0 must be included in a V′ and VP.

The examples in (5.51) and (5.53) seem to provide counterevidence for the Economy principle. However, as has been noted by Vikner (1997), Engdahl (1997), Sells (2001), the two possible orderings are associated with different interpretations. Sells (2001:41) lists the following generalizations, which are based mainly on unpublished research by Elisabet Engdahl:[11]

[10] Again, I am not including the negation. Sells here assumes that the pronoun is included in an NP, whereas I assume a DP. This is not an important difference.

[11] Engdahl also cites Christer Platzack, who has pursued similar ideas.

- The pronoun shifts when it would fall within the focal domain, even if it is not itself focussed.
- An accented pronoun does not shift.
- A narrow focus pronoun does not shift.

The Economy principle only influences the c-structure representation: it cannot prune structures if this pruning has an effect on the interpretation of the sentence (recall the discussion of (4.35) in section 4.5). Since (5.51) and (5.53) are associated with different interpretations, Economy does not chooce between them.

V2 and Economy

A finite verb appears in second position (V2) in main clauses:

(5.55) (a) *Pelle städade rummet.*
P. cleaned room.the
'Pelle cleaned the room.'

(b) *Rummet städade Pelle.*
room.the cleaned P.
'The room is what Pelle cleaned.'

As was discussed in section 1.2 above, I assume that the verb appears in I^0 in subject-initial clause (such as (5.55a)), and in C^0 when a non-subject precedes the verb.

There is no V2 effect in subordinate clauses:

(5.56) (a) *Han sade [att Pelle gärna städade rummet].*
he said that P. with.pleasure cleaned room.the
'He said that Pelle cleaned the room with pleasure.'

(b) *Maria hävdade [att Göran verkligen inte uppförde sig moget.]*
M. claimed that G. really not behaved SELF maturely
'Maria claimed that Göran really did not act mature.'

In subordinate clauses, the verbal head follows negations and other adverbs, as illustrated in (5.56). The subordinate verb is therefore standardly assumed to appear in V^0.

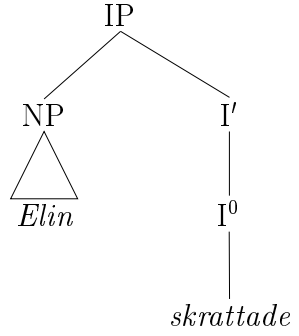
Let us compare the structure of a simple main clause (5.57a) to the structure of a simple subordinate clause (5.57b):

(5.57) (a) *Elin skrattade.*
E. laughed
'Elin laughed.'

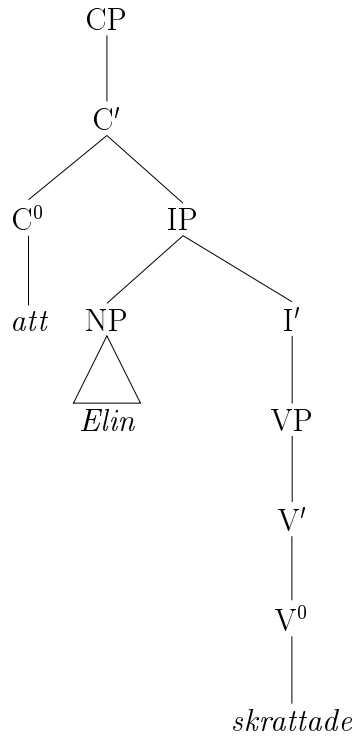
(b) *... att Elin skrattade.*
that E. laughed
'...that Elin skrattade.'

The structure for (5.57a) is given in (5.58a), and the structure for (5.57b) is given in (5.58b):

(5.58) (a)



(b)

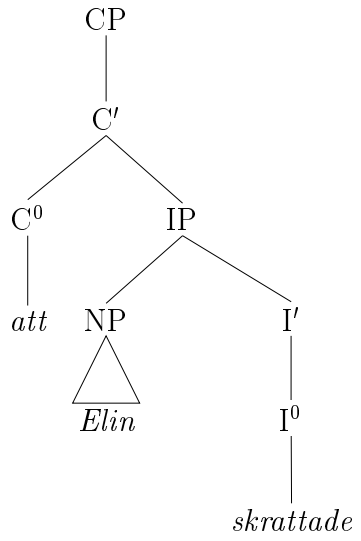


As established above, the main clause verb is in I^0 (5.58a), and the subordinate clause verb is in V^0 (5.58b).

A finite verb in Swedish can thus be of the category V^0, I^0, or C^0, and this explains why it is possible for verbs to appear in all three positions. However, it does not explain the *pattern* of distribution. Why are main clauses verb-second, and subordinate clauses not? This is a general problem for linguistic theory, and has been an important topic in the syntax literature for a long time. However, let us set this general problem aside for a moment, and consider how these structures relate to Economy.

Consider the subordinate structure in (5.58b). The main clause facts show that it is in principle possible for a finite verb to appear in I^0, and such a structure would in fact be more economical than (5.58b), as becomes clear if we compare it to (5.59):

(5.59)



The fact that (5.58b) is favored over (5.59) seems to provide evidence against the Economy principle, since (5.59) involves less structure.

It was mentioned above that the V2 phenomenon is a general phenomenon that needs an explanation independent of Economy considerations, and researchers have therefore previously analyzed the meaning and use of V2. Stephen Wechsler has studied V2 in Swedish specifically, and he has shown that V2 is correlated with a certain illocutionary force,[12] in particular that of *direct assertion*. Since a verb in second position is associated with a certain semantic interpretation, Economy cannot choose between a V2 clause and a non-V2 clause.

Wechsler (1991) defines a direct assertion clause as (5.60):

(5.60) A clause E with propositional content p is a *direct assertion clause* iff p is the content of an assertion made by the speaker in a sincere utterance of E.

When E is an embedded clause then 'an utterance of E' means an utterance of the matrix clause containing E. Wechsler (1991) shows that all V2 clauses in Swedish are direct assertion clauses. He discusses several facts that support his proposal, and I will cite some relevant examples here. For a full discussion, see Wechsler's paper, and also Andersson (1985) and Sells (2001).

[12]See Searle (1969).

Although the verb is usually situated in V^0 in subordinate clauses, V2 is sometimes possible also in non-main clauses. Wechsler shows that V2 is only possible in a subordinate clause if this clause is an assertion. Consider (5.61):

(5.61) *Då kände jag [att jag har inte lust att lägga ner energi på*
then felt I that I have not desire to lay down energy on
att försöka komma överens med honom].
to try come along with him
'Then I felt that I don't feel like putting an effort into trying to get along with him.' (PAR)

The example in (5.61) consists of two separate assertions, one for the main clause and one for the subordinate clause, and both clauses are V2 (*har* 'have' precedes the negation *inte*).

Subordinate clauses that are introduced by non-assertion complementizers such as *om* 'if' and *ifall* 'in case' cannot be V2 (Wechsler 1991:181):

(5.62) (a) *Jag blir ledsen [om du inte kommer].*
I get sad if you not come
'I (will) get sad if you don't come.'

(b) **Jag blir ledsen [om du kommer inte].*
I get sad if you come not

The examples in (5.62) contain the non-assertion complementizer *om* 'if'. We see that the non-V2 subordinate clause is grammatical, whereas the V2 clause in (5.62b) is not. I conclude that V2 clauses are connected with a special interpretation, and the structures in (5.58b) and (5.59) above do not compete under Economy.

In sum, both Object Shift and V2 present apparent problems for the Economy principle. However, in each case, the compared structures have been previously shown to involve different interpretations. Economy is then irrelevant, since it can only prune away structures if this has no influence on the f-structure or the semantics.

5.6 Summary

The Swedish VP-structure is very simple and follows straightforwardly from the general LFG architecture and the specific c-structure theory laid out in chapter 4. In that chapter, I also hypothesized that all non-projecting words are head-adjoined, and this chapter presented data supporting the head-adjunction hypothesis.

Non-projecting verbs and nouns are not as well-studied as adjectival, and especially prepositional particles. I discussed several examples in sections 5.2 and 5.4, and concluded that they form complex predicates with the verbal head.

The Economy principle proved to be particularly important for our treatment of the particles. We saw that the Swedish verbal particles provide straightforward empirical evidence which motivates the existence of an Economy principle in the grammar.

Chapter 6

The meaning of Swedish particles

The previous chapters have focussed on the structural realization of the verbal particles, and I have argued for a very simple c-structure. However, particles and verb-particle combinations have some intricate semantic properties, and this has led many previous researchers to assume a more complicated syntactic realization. We will see in this chapter that the LFG architecture makes it possible to account for the semantics without complicating the c-structure.

Swedish particles have two semantic functions: they are either resultative predicates or aspect markers. The resultative particles are discussed in section 6.1, and the aspectual particles are discussed in section 6.2. Verb-particle combinations can also be idiomatic, as we will see in section 6.3. Some idiomatic particles are resultative predicates, some are aspectual markers, and sometimes it is not possible to determine the function of the particle within the idiomatic verb-particle complex. In those cases, the verb-particle combinations are analyzed as complex predicates.

6.1 Resultative particles

Particles often denote a location:[1]

(6.1) (a) *Han lade* **ner** *boken.*
he laid down book.the
'He put the book down.'

(b) *... när hon ville köra* **hem** *honom.*
when she wanted drive home him
'... when she wanted to drive him home.' (PAR)

The particles in (6.1) denote the end location of the direct object, a function which can also be expressed with full PPs:

(6.2) (a) *Han lade boken på bordet.*
he laid book.the on table.the
'He put the book on the table.'

(b) *Sam skulle köra honom till arbetet.*
S. would drive him to work.the
'Sam would drive him to work.' (PAR)

The particle *ner* in (6.1a) denotes the location of the object, and the same function is fulfilled by the PP *på bordet* in (6.2a). Similarly, the particle *hem* in (6.1b) has the same function as *till arbetet* in (6.2b).

The particle *ner* 'down' does not denote as specific a location as *hem* 'home' does. It is common for particles to leave the location vague. Typical uses of the particle *i* 'in' are illustrated in (6.3):

(6.3) (a) *Och jag, som hatade vatten, skulle förstås som alltid ramla*
And I who hated water would of.course as always fall
i *med kläderna på, ...*
in with clothes.the on
'And I, who hated water, would of course as always fall in with my clothes on,...' (PAR)

[1]Much of the material treated in this section is also discussed in Toivonen (1999).

(b) *Han hoppade* **i**.
he jumped in
'He jumped in (understood: into the water).' (PAR)

(c) *... och hällde* **i** *te åt dem.*
and poured in tea for them
'...and poured tea for them.' (PAR)

(d) *Han utlovade t.ex. två dollar för att skruva* **i** *en glödlampa.*
he promised e.g. two dollars for to screw in a lightbulb
'He promised for example two dollars to screw in a lightbulb.' (PAR)

The particle *i* in each sentence in (6.3) indicates that there is a location (typically an enclosure) where the object (in transitive sentences) or the subject (in intransitive sentences) ends up after the activity denoted by the verb is completed. The specific location is understood in the context, but it is not openly expressed.

This section discusses the use of particles as locations, understood or specific. In section 6.1.1, I argue that the location the particle denotes is necessarily a resultative end state, which can be a location or a property. In section 6.1.2, I show how the generalization arrived at in 6.1.1 can be captured while keeping the syntactic representation simple. Finally, section 6.1.3 discusses resultatives which are predicated of the subject.

6.1.1 Condition P

This section shows that optionally projecting words *must* project under certain circumstances, even if they are unmodified. In particular, I will demonstrate that in order for a word to fill the particle position, it must denote a resultative end state. Let us first consider two typical particle examples in (6.4):

(6.4) (a) *Han la* **ner** *boken i knät.*
he laid down book.the in lap.the
'He put the book down in his lap.' (PAR)

(b) *... så du bara kan sparka* **ut** *mig och pojken!*
so you just can kick out me and boy.the
'...so that you can just kick me and the boy out!' (PAR)

In (6.4), the particle denotes the location of the object. The particles *ner* and *ut* at first appear to be directional obliques, but I will argue here that they are in fact resultative predicates, and that a word *must*, in fact, be a resultative in order for it to appear in the particle position (setting aside idiomatic and aspectual particles). Specifically, the particle position can only be filled when the condition in (6.5), which I call *Condition P*, holds:[2]

(6.5) **Condition P:**
The particle position can be filled only when the place expression denotes the *end state* of the entity denoted by the object (transitive clauses) or subject (intransitive clauses), and when this end state is the *direct result* of the activity denoted by the verb.

I will present several arguments for Condition P below, but note first that Swedish differentiates between *locative* and *directional* place expressions, as shown in (6.6):[3]

(6.6) (a) *Elin sitter här.*
E. sits here.LOC
'Elin sits here.'

(b) *Elin sprang hit.*
E. ran here.DIR('hither')
'Elin ran here.'

(c) *Elin leker hemma.*
E. plays hom.LOC
'Elin plays at home.'

(d) *Elin kommer hem.*
E. comes home.DIR
'Elin comes home.'

The one-word place expressions *här* and *hemma* denote fixed locations, whereas *hit* and *hem* denote directions. Now consider the examples in (6.7-6.8):

[2]Condition P pertains to both subjects of intransitives and objects of transitives, but I will focus on the objects of transitives, as the presence of an object makes it clear whether or not a word is a particle.

[3]A note on terminology: I use *locative* to distinguish stative place expressions from directional place expressions. I use *locational* to refer to any kind of place expression, locative or directional.

(6.7) (a) *Maria slänger (dit) bollen (dit).*
M. throws (there.DIR) ball.the (there.DIR)
'Maria throws the ball there.'

(b) *Maria skjutsar (hem) henne (hem).*
M. drives (home) her (home)
'Maria drives her home.'

(6.8) (a) *Elin förvarar (*där) kakorna (där).*
E. keeps (*there.LOC) cookies.the (there.LOC)
'Elin keeps the cookies there.'

(b) *Elin lämnar (*hemma) barnet (hemma).*
E. leaves (*home.LOC) child.the (home.LOC)
'Elin leaves the child at home.'

A superficial comparison of (6.7-6.8) would lead to the conclusion that directional place expressions may appear in the particle position, whereas locatives cannot. I will argue that this is not the correct conclusion. Instead, the right generalization is that the particle position can only be filled when Condition P holds. There is thus a difference in meaning between *Maria slänger dit bollen* and *Maria slänger bollen dit*: *dit* in the former sentence denotes the end state of the object, whereas *dit* in the latter sentence denotes the direction of the activity.

This section presents five arguments for Condition P. First, adjectival particles must denote results. Second, particles cannot precede the direct object unless Condition P holds. Third, the particle position can be filled even with a verb which selects for a locative place expression, if Condition P holds. Fourth, there is often a clear difference in meaning depending on the positioning of the place expression. Fifth, Swedish has a productive resultative construction with a filled particle position.

First, let us consider adjectival particles. The examples in (6.9) include the adjectival particle *lös*:

(6.9) (a) *Då ska universitetet och Chalmers öppna dörrarna och*
then will university.the and C. open doors.the and
släppa **lös** *forskarna på stan.*
let free researchers.the on town.the
'Then the university and Chalmers will open the doors and let the researchers out on the town.' (PAR)

(b) *Tyvärr brukar han en ohederlig citatteknik och*
unfortunately uses he a dishonest citation.technique and
rycker **lös** *meningar ur sina sammanhang.*
pulls free sentences out.of their contexts
'He unfortunately uses a dishonest citation technique and pulls sentences out of their context. (PAR)

The adjective *lös* 'free, loose' is used as a particle in (6.9), but *lös* does not have to be a particle, as we see in (6.10):

(6.10) (a) *Den där pojken har minst en skruv lös, sa Thorstvedt,*
that there boy has at.least one screw loose, said T,
men han kan bli fotbollsspelare av världsklass
but he can become soccer.player of world.class
'That boy has at least one screw loose, said Thorstvedt, but he can become a world class soccer player.' (PAR)

(b) *Det springer en vargliknande hund lös på Stocksundsbron.*
there runs a wolf.like dog free on S.bridge
'A dog who looks like a wolf is running free on the Stocksund bridge.' (PAR)

In (6.10), the adjective *lös* is used depictively, so we know that it *can* be used that way. A depictive reading is not, however, possible when *lös* is a particle, as in (6.9). In fact, *all* adjectival particles must be resultatives, in accordance with Condition P. I will not list more examples here, since many have already been cited in previous chapters. As the reader can check, all the adjectival particles cited in previous chapters are resultatives.

The second argument for Condition P comes from examples where the particle position cannot be filled:[4]

[4]There are Swedish two words that both translate into English 'follow': *följa* and *förfölja*. *Följa* means 'follow, accompany', whereas *förfölja* means 'follow, pursue'.

(6.11) (a) *James Bond förföljde mannen hem.*
J. B. followed man.the home.DIR
'James bond followed the man home.'

(b) **James Bond förföljde* **hem** *mannen.*
J. B. followed home.DIR man.the

The place expression *hem* in (6.11) is directional. If it were the case that all directionals which do not have to project (and *hem* does not have to project, as shown above in (6.7b)) can appear in the particle position, then (6.11b) should be grammatical, which it is not. Condition P does not hold: even though it might be true that the man is at home after James Bond has followed him, this is not a direct result of the fact that he was followed. In other words, the fact that Bond followed the man did not cause the man to get home. Given this, we would not expect *hem* 'home' to appear in the particle position.

The third argument for Condition P concerns verbs which lexically select for locative place expressions:

(6.12) (a) *Matts lägger boken där.*
M. lays book.the there.LOC
'Matts puts the book there.'

(b) *Göran hänger tavlan uppe på väggen.*
G. hangs painting.the up.LOC on wall.the
'Göran hangs the painting up on the wall.'

The location where the book is put in (6.12a) and the painting is hung in (6.12b) can be seen as the resultative end states of the objects, caused to hold by the action denoted by the verb. Not surprisingly, the sentences in (6.13) are also permitted:

(6.13) (a) *Matts lägger* **dit** *boken.*
M. lays there.DIR book.the
'Matts puts the book there.'

(b) *Göran hänger* **upp** *tavlan på väggen.*
G. hangs up.DIR painting.the on wall.the
'Göran hangs up the painting on the wall.

The examples in (6.13) show that the particle position can be filled together with verbs that potentially fulfill Condition P, even if those verbs normally take locative arguments.

An important question is whether there is a meaning difference between the sentences in (6.12) and the ones in (6.13). The example in (6.12b) invites a different reading than (6.13b): (6.12b) creates an image where *Göran* is on the wall (or, more naturally, on a scaffold by the wall) while he is hanging the painting. The place expressions in (6.12) thus modify the whole VP and simply add information about the location, whereas the place expressions in (6.13) specifically denote the resultative end state of the direct object, so in (6.13) Göran does not have to be on a scaffold but could be on the floor (not all speakers have clear intuitions about the difference between these two sentences). Although the intuitions are less clear, there seem to be a simliar difference between the pre- and post-object place expressions in (6.7) above. The two different senses are very close in the examples we have seen so far, and the readings are difficult to tease apart since they (often) describe the same situation in the world. There are, however, sentences where the distinction is much clearer, as we see in (6.14-6.15):

(6.14) (a) *Hans tog* **hem** *bussen.*
H. took home bus.the
'Hans brought home the bus.'

(b) *Hans tog bussen hem.*
H. took bus.the home
'Hans took the bus home.'

(6.15) (a) *Peter tog* **ner** *hissen.*
P. took down elevator.the
'Peter brought down the elevator.'

(b) *Peter tog hissen ner.*
P. took elevator.the down
'Peter took the elevator down.'

(6.16) (a) *Flickan tog* **tillbaka** *stigen.*
girl.the took path.the
'The girl took back the path.'

(b) *Flickan tog stigen tillbaka.*
girl.the took path.the back
'The girl took the path back.'

The (a) sentences entail that the object is at the location denoted by the particle after the event has taken place (according to Condition P). The 'transportation sentences' in the (b) examples do not have this interpretation. In (6.14a), the bus necessarily ends up at home, but (6.14b) simply means that Hans rode the bus home. The example in (6.16a) only has the bizarre reading that the girl brought the path back, whereas the (b) example describes the more likely scenario where the girl walked back on the path. The (b) examples are arguably subject predicated results, and will be discussed further in section 6.1.3.

A final piece of evidence for Condition P comes from the fact that you can add a particle to VPs that do not normally take directional or locative complements. You then force a resultative interpretation, so that the interpretation is roughly the following: *subject did X and the end result of X is that the object is Y.* Some examples are given in (6.17):

(6.17) (a) *Ulla charmade* **hem** *Per.*
U. charmed home P.
'Ulla charmed Per home.'

(b) *Han pratade* **hit** *mannen.*
he talked here man.the
'He talked the man here.'

Sentence (6.17a) has the interpretation that Ulla charmed Per and the result of that is that he is at home (probably Ulla's home). Similarly, the result of the talking in (6.17b) is that the man is 'here'. It is important to note that sentences such as those in (6.17) are not fixed expressions, but freely coined.

The word order is crucial: the examples in (6.18) are ungrammatical:[5]

(6.18) (a) **Ulla charmade Per hem/hemma.*
U. charmed P. home.DIR/LOC

(a) **Han pratade mannen hit/här.*
he talked man.the here.DIR/here.LOC

The resultative reading of the particles is thus productive, in the sense that a particle can be added to a verb and an object to force the Condition P reading.

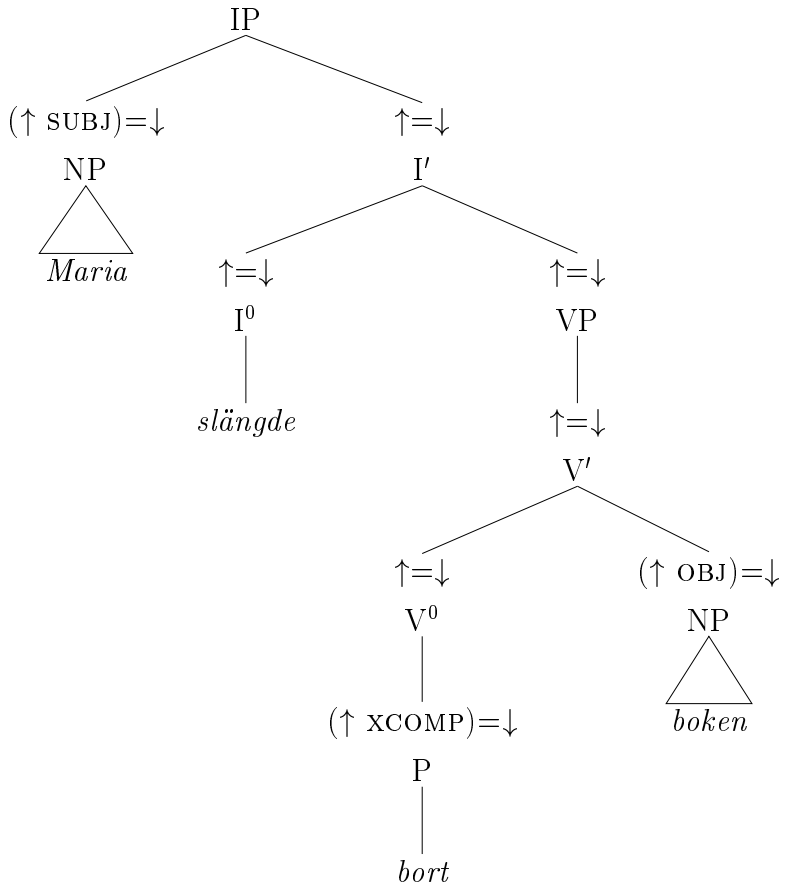
6.1.2 Lexical and syntactic representation

I have argued above that the locational particles in Swedish are resultative predicates, predicated of the object. The particle thus maps into an f-structure XCOMP. The c-structure and f-structure representations of (6.19) are given in (6.20) and (6.21):

(6.19) *Maria slängde* **bort** *boken.*
M. threw away book.the
'Maria threw the book away.'

[5]That is, they are ungrammatical with respect to the intended interpretation. One of the four sentences, *Ulla charmade Per hemma*, would be grammatical if it the intended meaning was that Ulla charmed Per while they were at home. All the other sentences are ungrammatical.

(6.20)



(6.21)

$$\begin{bmatrix} \text{PRED} & \text{‘throw <(↑ SUBJ) (↑ OBJ)(↑ XCOMP)>’} \\ \text{TENSE} & \text{PAST} \\ \text{SUBJ} & \begin{bmatrix} \text{“Maria”} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{‘book’} \\ \text{DEF} & + \end{bmatrix} \\ \text{XCOMP} & \begin{bmatrix} \text{PRED} & \text{‘away’} \\ \text{SUBJ} & [\ ] \end{bmatrix} \end{bmatrix}$$

Note that the XCOMP subject is the same as the matrix object, so that ‘Maria threw the book, and the book was away’.

It might seem odd that *slänga* 'to throw' has an XCOMP in its lexical entry. After all, it is possible to use *slänga* with just an object, as we see in (6.22):

(6.22) *Jag kan inte med att slänga dem.*
I can not with to throw them
'I can't stand to throw them out/away.' (PAR)

The (Swedish) sentence in (6.22) is grammatical even though it does not include a location. For the particular verb *slänga* 'to throw', we could posit a lexical entry with an optional XCOMP. However, this is not a suitable solution for all verbs that can appear with resultative particles. Consider especially the examples given in (6.17), where the resultative interpretation is forced by the presence of the particle, and does not seem to have anything to do with the basic argument structure of the verb. More such examples are given in (6.23):

(6.23) (a) *... de lurar inte* **dit** *honom.*
they trick him there not
'≈...they don't get him to go there by tricking him.' (PAR)

(b) *... men det var som väntat en annan person som lockat* **dit** *henne.*
but it was as expected an other person who tempted there her
'...but it was, as expected, another person who had tempted her (to go) there.' (PAR)

(c) *Men vi ska inte förklara* **bort** *förlusten.*
but we shall not explain away loss.the
'But we will not explain the loss away.' (PAR)

(d) *Du tjatar* **ihjäl** *oss.*
you nag to.death us
'You nag us to death.' (PAR)

(e) *... att tjata* **fram** *en akut ryggoperation.*
to nag forth an urgent back.operation
'...to bring about an important back operation through nagging.' (PAR)

Sentences such as the ones in (6.17) and (6.23) are productively coined. This is captured here with the lexical rule in (6.24).[6] As part of the derived lexical entry, I give a simplified semantic representation drawing upon Jackendoff's (1983, 1990b) formalization of Lexical Conceptual Structure (LCS):[7]

(6.24) **Resultative rule – transitives:**

$$\text{`}verb_a\text{'} \rightarrow \text{`}verb_b\text{'} \quad \begin{array}{l} (\uparrow \textsc{pred}) = \text{`}...<(\uparrow \textsc{subj}_1)(\uparrow \textsc{obj}_2)(\uparrow \textsc{xcomp}_3)>\text{'} \\ (\uparrow \textsc{xcomp subj}) = (\uparrow \textsc{obj}) \\ \textbf{LCS:} \left[\begin{array}{l} \text{CAUSE ([1],[BE ([2],[3])])} \\ \text{[BY [VERB ([1],...)]]} \end{array} \right] \end{array}$$

The lexical correspondence rule in (6.24) states that any given verb may correspond to a verb with the arguments < (SUBJ) (OBJ) (XCOMP)>, where the XCOMP's subject corresponds to the matrix object. This captures the generalization we are interested in: it is possible to productively insert a verb in a certain argument frame and get a resultative reading. The LCS simply says that by performing the activity denoted by the verb, the subject makes the object be X. For concreteness, let us look at the LCS of (6.19) (repeated below as (6.25)):

(6.25) *Maria* *slängde* **bort** *boken.*
M. threw away book.the
'Maria threw the book away.'

(6.26) **LCS:** $\left[\begin{array}{l} \text{CAUSE ([MARIA],[BE ([BOOK],[AWAY])])} \\ \text{[BY [THROW ([MARIA],[BOOK])]]} \end{array} \right]$

The LCS in (6.26) captures the notion that Maria threw the book, and the result of the throwing is that the book is away.

The lexical rule in (6.24) does not make any reference to particles. Anything that can be annotated as an XCOMP in the c-structure can express the end location according to the rule. Since XCOMP is one of the functions that Swedish particles can have, it

[6] Carrier and Randall (1992) also take a lexical rule approach to resultatives, but see Jackendoff (1990b,chapter 10), Goldberg (1995, chapter 8) and Verspoor (1998) for constructional accounts.

[7] A note on the notation: the numerical indices indicate which argument is connected to which grammatical function.

follows that particles can correspond to that function. The XCOMP function can of course also be filled by a full post-object XP, as in the following examples:

(6.27) (a) *Dela ananasen* I SMÅBITAR *och skär även mangon* I
divide pinapple.the in little.pieces and cut also mango.the in
BITAR.
pieces
'Cut the pineapple into little pieces and also cut the mango into pieces.'
(PAR)

(b) *Han ruskade mej* VAKEN *med hotelser.*
he shook me awake with threats
'He shook me awake under threats.' (PAR)

The resultative predicates in (6.27a) are PPs, and the result in (6.27b) is an AP.

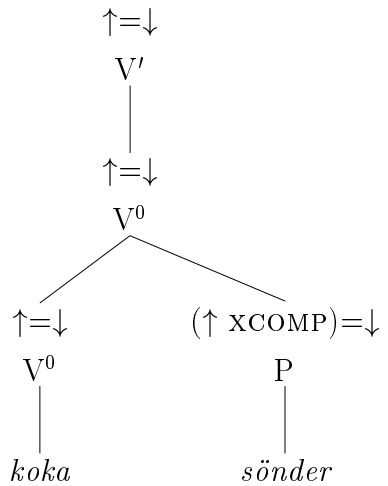
Until now I have mainly focused on resultative particles in transitive sentences, because it is easy to tell whether or not a word is a particle in those sentences (since the particle always precedes the direct object). Resultative particles can of course also appear in intransitive sentences, as we see in (6.28):

(6.28) (a) *Potatisen kan koka* **sönder**.
potato.the can boil broken
'The potatoes may boil until they break.'

(a) *Pojken ramlade* **ner**.
boy.the fell down
'The boy fell down.'

The c-structure representation of the VP in (6.28a) is (6.29):

(6.29)



A resultative XCOMP can be added to an intransitive verb by the following lexical rule:[8]

(6.30) **Resultative rule – intransitives:**

$$\text{`}verb_a\text{'} \rightarrow \text{`}verb_b\text{'} \quad \begin{array}{l} (\uparrow \textsc{pred}) = \text{`...}<(\uparrow \textsc{subj}_1)(\uparrow \textsc{xcomp}_3)>\text{'} \\ (\uparrow \textsc{xcomp subj}) = (\uparrow \textsc{subj}) \end{array}$$

$$\textbf{LCS:} \quad \left[\begin{array}{l} \text{CAUSE ([1],[BE ([1],[3])])} \\ \text{[BY [VERB}_b\text{ ([1])]]} \end{array} \right]$$

The LCS in (6.30) conveys the following notion: The subject performs the activity denoted by the verb, and the result is that the subject is X. The example in (6.28a) has the LCS representation given in (6.31):

(6.31) $$\left[\begin{array}{l} \text{CAUSE ([POTATOES],[BE ([POTATOES],[BROKEN])])} \\ \text{[BY [BOIL ([POTATOES])]]} \end{array} \right]$$

As is well-known, a resultative secondary predicate used together with an intransitive verb often calls for a so-called *fake reflexive* (Simpson 1983, Levin and Rappaport 1989, Jackendoff 1990b, Carrier and Randall 1992, Levin and Rappaport Hovav 1995). This is seen in examples like *laugh oneself silly* and *cry oneself to sleep*. Two examples from Swedish are given in (6.32); (6.32a) has a full PP result, and (6.32b) has a particle result:

[8]The rule in (6.24) and the rule in (6.30) can be collapsed into a single rule, but I am keeping them separate for the sake of clarity.

(6.32) (a) *Jag måste ha gråtit mig till sömns.*
I must have cried me to sleep
'I must have cried myself to sleep. (PAR)

(b) *Folk skulle ju kunna skratta* **ihjäl** *sig.*
people could surely be.able laugh to.death SELF
'People could obviously laugh themselves to death.' (PAR)

Resultatives with fake reflexives have received much attention in the literature. The basic generalization for English is that unaccusative verbs do not need a fake reflexive whereas unergatives do (Simpson 1983, Levin and Rappaport 1989). As far as I can tell, this generalization is true for Swedish as well. Note that resultatives with fake reflexives are compatible with the lexical rule given for transitives in (6.24): we can think of *Susie laughed herself silly* as 'Susie laughed, and as a result she seemed/felt silly'.

6.1.3 Results predicated of subjects

This section considers cases where the place expression cannot be expressed with a particle. Such an example was given in (6.11), repeated here as (6.33):

(6.33) (a) *James Bond förföljde mannen hem.*
J. B. followed man.the home.DIR
'James bond followed the man home.'

(b) **James Bond förföljde* **hem** *mannen.*
J. B. followed home.DIR man.the

The place expression *hem* cannot be expressed as a particle in (6.33), since Condition P does not hold.

Wechsler (1997) discusses some examples from English which are similar to (6.33), although he does not use examples where particles are involved (1997:313):

(6.34) (a) *The wise men followed the star out of Bethlehem.*

(b) *The sailors managed to catch a breeze and ride it clear of the rocks.*

The PP *out of Bethlehem* in (6.34) is not predicated of *the star:* the star does not end up in Bethlehem. Similarly, the breeze does not end up clear of the rocks in (6.34b).

Instead, Wechsler argues, the results in (6.34) are predicated of the subjects: the wise men go to Bethlehem, and the sailors get clear of the rocks. These examples are then counterexamples to the Direct Object Restriction (DOR; Levin and Rappaport Hovav 1995, (Simpson 1983)) which states that the resultative of a transitive clause must be predicated of the object. Wechsler (and also Rappaport Hovav and Levin (2001)) concludes that the DOR is incorrect: there *are* subject-predicated resultatives.

The transportation sentences in the (b) examples of (6.14-6.16) given above also exemplify subject-predicated place expressions. I repeat the examples here for convenience:

(6.35) (a) *Hans tog bussen hem.*
H. took bus.the home
'Hans took the bus home.'

(b) *Peter tog hissen ner.*
P. took elevator.the down
'Peter took the elevator down.'

(c) *Flickan tog stigen tillbaka.*
girl.the took path.the back
'The girl took the path back.'

The place expressions in the transportation examples in (6.35) are unambiguously subject-predicated in Swedish, whereas the English translations are actually ambiguous: the place expressions describe the end location of either the subject or the object. In (6.35a-b), it is hard to tease apart the two readings, since both the subject (Hans, Peter) and the means of transportation (the bus, the elevator) are at the end point when the activity is completed. However, in (6.35c), it is clear that the object does not end up at the end location, since *the path* is not the means of transportation.

Now consider the (a) examples of (6.14-6.16) above (repeated here as (6.36)) where the place expressions are particles and unambiguously object-predicated in both Swedish and English:[9]

[9]Note again that example (6.36c) is odd (in both Swedish and English). It is not ungrammatical, but it has the unlikely reading where the girl is reclaiming the path.

(6.36) (a) *Hans tog* **hem** *bussen.*
H. took home bus.the
'Hans took home the bus.'

(b) *Peter tog* **ner** *hissen.*
P. took down elevator.the
'Peter took down the elevator.'

(c) *Flickan tog* **tillbaka** *stigen.*
girl.the took back path.the
'The girl took back the path.'

After the activity is completed, the objects in (6.36) are at the place denoted by the particle: the bus is home (6.36a); the elevator is down (6.36b); and the path is back (6.36c).

The following generalizations emerge from the data in (6.33-6.36):[10]

(6.37) (1) There are both subject-predicated and object-predicated resultatives (Wechsler 1997, Rappaport Hovav and Levin 2001).

(2) Particles (X) can only be predicated of the object.

(3) Swedish only: Optionally projecting words are predicated of the subject when they project (X^0).

(4) English only: Optionally projecting words are predicated of the subject or the object when they project (X^0).

When a word is modified, it always projects, whether it is predicated of a subject or an object. The generalizations of (6.37) repeated in (6.38), with references to relevant examples:

[10] By 'particle', I here mean words that are traditionally called particles and precede the direct object. The formal nature of such words in English is actually different from that of the Swedish particles, as will be discussed in section 7.3.

(6.38)

	V^0	particle	object NP	PP
SWEDISH		object-predicated (6.36)		subject-predicated (6.35)
ENGLISH		object-predicated (6.36)		subject- or object-predicated (6.34), (6.35)

Generalization (6.36:1) can be formally captured by changing the control specification in the lexical rule in (6.24) from OBJ (6.39) to CGF (6.40), where CGF stands for CORE GRAMMATICAL FUNCTION:[11]

(6.39) **Resultative rule – transitives:** (old)

$$\text{`}verb_a\text{'} \rightarrow \text{`}verb_b\text{'} \quad (\uparrow \text{PRED}) = \text{`...}<(\uparrow \text{SUBJ}_1)(\uparrow \text{OBJ}_2)(\uparrow \text{XCOMP}_3)>\text{'}$$
$$(\uparrow \text{XCOMP SUBJ}) = (\uparrow \text{OBJ})$$

(6.40) **Resultative rule – transitives:** (modified version)

$$\text{`}verb_a\text{'} \rightarrow \text{`}verb_b\text{'} \quad (\uparrow \text{PRED}) = \text{`...}<(\uparrow \text{SUBJ}_1)(\uparrow \text{OBJ}_2)(\uparrow \text{XCOMP}_3)>\text{'}$$
$$(\uparrow \text{XCOMP SUBJ}) = (\uparrow \text{CGF})$$

The SUBJ and OBJ functions are considered CGFs in LFG (Bresnan 2001:96). The event structure of a given sentence will resolve CGF as SUBJ or OBJ in a given sentence (Rappaport Hovav and Levin 2001, Marcotte 2001).

The change in control specification is necessary to capture generalization (6.37:1), but it also brings out a new problem: the generalization that resultative particles must be object-predicated (6.37:2) is no longer successfully captured, since the controlling CGF is not necessarily the object. This problem is easily solved by adding an object control specification in the phrase structure rule which generates XCOMP particles. The phrase structure rule in (6.41) is a modification of the rule in (5.25):[12]

(6.41) $$V^0 \rightarrow \begin{array}{ll} V^0 & X \\ \uparrow=\downarrow & (\uparrow \text{XCOMP})=\downarrow \\ & (\uparrow \text{XCOMP SUBJ})=(\uparrow \text{OBJ}) \end{array}$$

[11] See Marcotte (2001) for a very similar analysis of resultatives in LFG.

[12] We still need a disjunction allowing the particle to be annotated ↑=↓, but I set that aside here for simplicity.

The specification in (6.41) ensures that the subject of an XCOMP particle is controlled by the object of the higher clause.

Generalization (6.37:3) refers to examples such as those in (6.35). The words *hem* 'home', *ner* 'down', and *tillbaka* 'back' optionally project. If they do project, as in (6.35), they must follow the object, since they cannot be head-adjoined. In this case, the resultative is necessarily predicated of the subject, since words never project unless they are forced to. If an optionally projecting unmodified word is predicated by an object, it must be a particle, by Economy (recall the discussion in section 5.5). Generalization (6.35:4) is explained by the fact that English particle placement involves a certain optionality not available to Swedish particles. Compare the Swedish example in (6.42) to the English example in (6.43):

(6.42) *John kastade (ut) soporna (*ut).*
J. threw out garbage.the out
'John threw out the garbage.'

(6.43) *John threw (out) the garbage (out).*

The examples above show the particle placement in English is more flexible than the one in Swedish. The particle in (6.42-6.43) is clearly object predicated. Swedish does not allow it to follow the object, but English does. Economy thus does not have an effect on object-predicated resultatives in English, unlike in Swedish. English particles will be discussed further in section 7.3, where I provide evidence that the structural representation of pre-object particles is not identical in the two languagues.

To sum up, Wechsler (1997) has shown that the DOR does not hold: results are sometimes predicated of the verb's subject. However, resultative particles can only be object-predicated. A slight modification of the transitive resultative rule in (6.24) and the V^0-level phrase structure rule for Swedish successfully capture the new facts brought up by Wechsler, as well as the transportation examples introduced here.

6.1.4 Discussion

A particle can denote a location (like *dit* 'there') or a property (like *sönder* 'broken'). There are certain restrictions on exactly what function this location or property may

have. I have captured these restrictions with *Condition P*, which states that the particle must denote the resultative state of the object (or subject, in intransitive clauses).

Results do not have to be expressed by particles, of course. Full XPs can also denote results. This was demonstrated above and is also shown below: in (6.44) the result is a particle, and in (6.45) the result is a full XP:

(6.44) *Johan* *sparkade* **ihjäl** *ormen.*
J. kicked to.death snake.the
'Johan kicked the snake to death.

(6.45) *Johan* *sparkade* *ormen* *blodig.*
J. kicked snake.the bloody
'Johan kicked the snake bloody.'

The fact that results can be expressed in these two different ways is relevant to a recent debate concerning resultatives. Jackendoff (1990b), Goldberg (1995), Verspoor (1998) and others argue that resultatives are best analyzed as constructions. Most recently, Verspoor (1998) lists several reasons for a constructional analysis. She claims that the construction has a fixed interpretation, and also that the interpretation does not seem to follow directly from compositional processes. One of her main arguments, however, is that the construction has the fixed syntactic form in (6.46):

(6.46) $\text{NP}_{subject}$ V $\text{NP}_{controlled}$ ResP

The data discussed in this section shows that there are two ways in which resultative clauses can diverge from the representation in (6.46). First, the result is not necessarily expressed with a full phrase after the object; it can be a particle as well. Second, the result is not necessarily object-controlled (Wechsler 1997). These facts show that one of the main arguments for a constructional analysis over a compositional analysis of resultatives does not hold.

6.2 Aspectual particles

The previous section considered particles that denote resultative locations or properties, and those particles figure the most prominently in the literature. However, particles may

also fulfill another important function: they can mark aspect. This section presents the three main aspectual particles in Swedish: *på* 'on', *upp* 'up' and *till* 'to' (see Norén 1996). Aspectual *till* denotes sudden or abrupt action and does not have a direct counterpart in English. We can compare the aspectual *på* and *upp* to English *on* and *up*, which may also mark aspect:[13]

(6.47) (a) *Bill ran on.*

(b) *Hilary talked on about her latest project.*

(6.48) (a) *Elena drank up the milk.*

(b) *Ben glued up the chair.*

Jackendoff (2001a) notes that *on* adds the sense 'keep on doing V' to the verb, and *up* roughly adds the sense 'completely'. The sentence in (6.47a) means something like 'Bill kept on running' and the sentence in (6.48a) means 'Elena drank the milk completely' or 'Elena completely finished the milk'.

Following Brinton (1988), Smith (1997), Olsen (1994) and others, I adopt the features *telic, dynamic* and *durative* as the basis for an analysis of aspect. The feature [+telic] denotes situations with an inherent end, and [−telic] those without an inherent end; [+dynamic] denotes events and [−dynamic] states; [+durative] denotes situations that hold over a length of time, and [−durative] punctiliar situations. Situations can be divided into classes based on these features:

(6.49)

Aspectual class	Telic	Dynamic	Durative	Examples
State	−	−	+	*know, have*
Activity	−	+	+	*run, paint*
Accomplishment	+	+	+	*destroy*
Achievement	+	+	−	*notice, win*
Semelfactive	−	+	−	*cough, tap*

[13]The examples in (6.47-6.48) are taken from Jackendoff (2001a), who discusses the aspectual particles in English. See also Emonds (1985:253), who makes reference to completive *up*. Klipple (1997) discusses aspectual uses of English particles as well.

The classification in (6.49) is based on Vendler (1957), Olsen (1994) and Smith (1997). The examples are Olsen's. I give English examples, but their Swedish correlates have the same aspectual characteristics.

The table in (6.49) is slightly misleading in that individual verbs exemplify fully specified aspectual classes. Verkuyl (1972) and many others have noted that aspectual meanings hold for sentences rather than individual verbs or verb phrases. For example, (6.50) presents a pair of sentence that differ in telicity, although they are both headed by *walk* (Smith 1997:4):

(6.50) (a) *Mary walked in the park.* (atelic)

(b) *Mary walked to school.* (telic)

Example (6.50a) has a locative complement and is atelic. Example (6.50b) has a directional complement which denotes the endpoint of the activity is telic.

Let us consider another example. The verb *cough* used by itself may be a semelfactive, but it can also be used iteratively (Smith 1997:18):

(6.51) (a) *Mary coughed.* (semelfactive)

(b) *Mary coughed for an hour.* (activity)

The modifying PP *for an hour* forces an iterative reading of the verb, and (6.51b) must be an activity, although (6.51a) can be a semelfactive.

Examples (6.50-6.51) show that the same verb can head clauses of different aspectual classes. Following Olsen (1994), I assume that verbs are lexically specified for some features but not others.[14] The unspecified features can be filled in by other lexical constituents. The verbs in (6.50-6.51) are lexically specified for aspect as in (6.52) and (6.53):

(6.52) *walk* + DYNAMIC
+ DURATIVE

[14]The system developed here is a bit different from Olsen's system: Olsen only allows positive specification, wheras I allow both positive and negative feature values.

(6.53) *cough* + DYNAMIC
− TELIC

The verbs *walk* and *cough* are inherently specified for some, but not all, aspectual features. The unspecified features are filled in by some other lexical material, for example a modifier, as in (6.50-6.51). (6.54) shows that objects can also influence the aspectual interpretation (Smith 1997:4):

(6.54) (a) *Edward smoked cigarettes.* (atelic)
(b) *Edward smoked a cigarette.* (telic)

Smoking cigarettes is an event without a clear endpoint, and (6.54a) is atelic. Smoking a cigarette does have a endpoint, and (6.54b) is telic.

The principle in (6.55) fills in underspecified aspect values:[15]

(6.55) Unspecified features receive negative values by default.

A consequence of (6.55) is that the verb *walk* will be [− TELIC] by default, unless telicity is positively specified by some other lexical material. Similarly, *cough* will be [− DURATIVE] by default.

Aspectual features are in this way filled in by lexical material (the verb or other words and phrases), by the pragmatic context (Olsen 1994), or by default. Importantly, the same attribute cannot simultaneously have two different values. If a verb is marked positively for a given feature, lexical material which is marked negatively for that feature cannot combine with that verb. For example, a [+ TELIC] modifier cannot combine with the verb *cough*, which is marked negatively for telicity:

(6.56) **He coughed in an hour.*

The verb *cough* is specified [− TELIC] and *in an hour* is specified [+ TELIC] so the two cannot be combined.

[15] The principle in (6.55) can be formalized in various ways; for example, by using actual defaults (see, e.g., Lascarides and Copestake 1999 and references cited there), or by reference to an *elsewhere* mechanism, which can be formalized by adding ordered disjunction (Erjavec 1994) to the regular expression language describing f-structures.

The features system sketched here will prove useful in classifying the aspectual particles. Tenny (1987) has shown that aspectual information is visible to syntactic processes, and I will model aspect in the syntactic level of f-structure (as does Glasbey 2001). The relevant features can be straightforwardly represented in the f-structure, but it is likely that some (perhaps all) aspectual information should be represented in the semantics, rather than in the syntax. I leave this open for now with the hope that the observations I make about the aspectual particles should be easily translated into any formal representation of aspect. For different theories of aspect, see the references listed earlier in this section, and also Dowty (1979), Pustejovsky (1991), Jackendoff (1991, 1996), and Verkuyl (1993).

6.2.1 The aspect marker *på*

Norén (1996:191) notes that the aspectual use of the particle *på* seems to have an independent sense of unboundedness which is added to the meaning of the verb in regular combinations. Examples are given in (6.57):

(6.57) (a) *Kretsloppet kan dock inte snurra* **på** *i all evighet.*
circulation.the can however not turn on in all eternity
'The circulation cannot keep moving forever.' (PAR)

(b) *... där man inte är bortskämd med lovord utan van*
there one not is spoiled with praise except accostumed
att kämpa **på** *i det tysta.*
to fight on in the quiet
'...where people aren't spoiled with praise, but instead accostumed to working quietly.' (PAR)

(c) *Åklagaren malde* **på**.
prosecutor.the ground on
'The prosecutor kept talking.' (PAR)

(d) *Arne lyssnade inte utan pratade* **på**.
A. listended not but talked on
'Arne didn't listen, but kept talking.' (PAR)

The only information *på* contributes to the sentences in (6.57) is aspectual: *på* requires the clause to be an activity, I assume that the full lexical entry for aspectual *på* is (6.58):

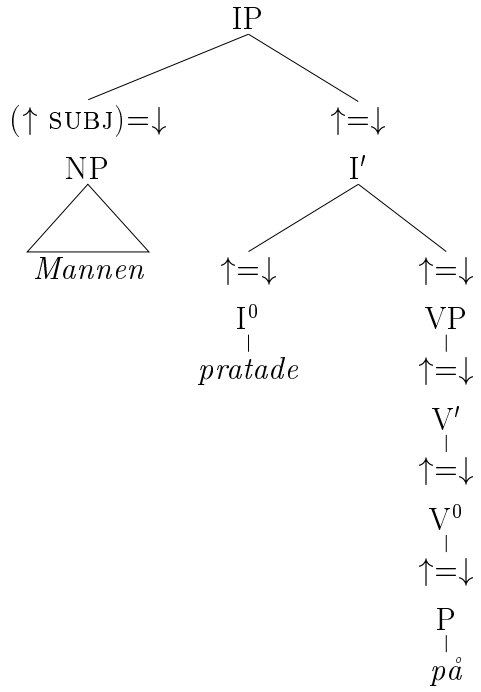
(6.58) *på:* P $(\uparrow \text{ASPECT TELIC}) = -$
$(\uparrow \text{ASPECT DYNAMIC}) = +$
$(\uparrow \text{ASPECT DURATIVE}) = +$

This lexical entry contains no information other than aspectual features; it does not have a PRED feature, for example.

The c-structure and f-structure representations for a sentence like (6.59) are given in (6.60-6.61):

(6.59) *Mannen* *pratade* **på**.
man.the talked on
'The man talked on.'

(6.60)



(6.61)
$$\begin{bmatrix} \text{PRED} & \text{talk} \\ \text{TENSE} & \text{PAST} \\ \text{ASPECT} & \begin{bmatrix} \text{TELIC} & - \\ \text{DYNAMIC} & + \\ \text{DURATIVE} & + \end{bmatrix} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{`man'} \\ \text{DEF} & + \end{bmatrix} \end{bmatrix}$$

The verb *prata* has the aspectal features [+DYNAMIC] and [+DURATIVE], which unify with the aspectual features of *på*.

Since *på* marks an atelic event, it cannot be used together with telic modifiers. Temporal PPs headed by *i* are atelic, as illustrated in (6.62a). Temporal PPs headed by *på* are telic (6.62b):

(6.62) (a) *Mannen pratade* **på** *i en timme.*
man.the talked on in an hour
'The man talked on for an hour.'

(b) **Mannen pratade* **på** *på en timme.*
man.the talked on on an hour
*'The man talked on in an hour.'

Aspectual *på* is also incompatible with verbs that inherently carry aspectual features incompatible with the ones given in (6.58):

(6.63) (a) **Mannen visste* **på**.
man.the knew on

(b) **Mannen vann* **på**.
man.the won on

The verb *veta* 'to know' denotes a state and has a negative dynamicity value. Since the aspectual features of *veta* and *på* are not compatible, the two cannot cooccur. Similarly, *vinna* 'to win' and *på* are incompatible, since *vinna* is inherently [+TELIC].

6.2.2 The aspect marker *upp*

The particle *upp* marks accomplishments. An accomplishment consists of a process, and an outcome or change of state; and the outcome is the completion of the process (Smith 1997:26–29). Some examples are given in (6.64):

(6.64) (a) *Han är mycket glad för att han inte drack* **upp** *den andra ölen.*
he is very happy for that he not drank up the second beer
'He is very happy that he didn't finish the second beer.' (PAR)

(b) *... hon hade städat* **upp** *i köket...*
she had cleaned up in kitchen.the
'...she had cleaned up in the kitchen...' (PAR)

(c) *De äter* **upp** *resten av kycklingen under tystnad.*
they eat up rest of chicken.the during silence
'They eat/finish the rest of the chicken in silence.' (PAR)

In (6.64a), the subject is happy because he did not drink *all* of the second beer; that is, he is happy that he did not complete the activity of drinking the beer. In (6.64b), the subject has cleaned the kitchen completely, and in (6.64c), 'they' eat *all* of the chicken.

The lexical entry for aspectual *upp* is given in (6.65):

(6.65) *upp:* P (↑ ASPECT TELIC) = +
(↑ ASPECT DYNAMIC) = +
(↑ ASPECT DURATIVE) = +

In Swedish, it is possible to add the aspectual *upp* to a verb-object[16] combination to get the meaning 'someone did V and the result is that NP is completed or finished', even when the object is not an thematic argument of the verb. This is illustrated with the examples in (6.66):

[16] I use the word 'object' loosely here. It refers to the structural object complement, not the thematic object of the verb.

(6.66) (a) *... där farfar en gång i den oförlåtliga*
there grandfather one time in the unforgivable
livsbejakelsens ragnarök drack **upp** *både gris, märr och*
life.acceptance's doomsday drank up both pig mare and
åkerjord.
farmland
'..where grandfather once [...] drank up both pig, mare and farmland.' (PAR)

(b) *De pengar som blev över vid köpet hade de festat*
the money which were over at buying.the had they partied
upp *på Lorensberg.*
up on L.
'They had partied up the left-over money at Lorensberg.' (PAR)

The example in (6.66a) means that the grandfather drank so much that the result was that the pig, the mare and the farmland disappeared (they were all presumably sold to finance his drinking). Similarly, 'they' in (6.66b) partied until all the money was gone. Note that the examples in (6.67) are ungrammatical:

(6.67) (a) **Farfar drack gris, märr och åkerjord.*
grandfather drank pig mare and farmland

(b) **De hade festat pengarna.*
they had partied money.the

The verb *dricka* 'to drink' normally takes some kind of liquid as its thematic object, and *festa* 'to party' does not take an object at all. It is the addition of *upp* that makes (6.66a-b) possible.

The particle *upp* denotes a bounded activity, which is reflected in its choice of modifier:

(6.68) (a) *Hon drack* **upp** *mjölken på en timme.*
she drank up milk.the on an hour
'She drank up the milk in an hour.'

(b) **Hon drack* **upp** *mjölken i en timme.*
she drank up milk.the in an hour
*'She drank up the milk for an hour.'

The verbs *eat* and *drink* are atelic when they take a mass noun as their object *(I drank milk)*. The same is true for their Swedish counterparts *äta* and *dricka*. Since *upp* is [+TELIC], it is only compatible with the [+TELIC] (definite) objects:

(6.69) (a) **Hon* *åt* **upp** *bröd.*
she ate up bread.MASS

(b) **Hon* *drack* **upp** *mjölk.*
she drank upp milk.MASS

In (6.69), *äta* and *dricka* are used with mass nouns and *upp*, and the examples are ungrammatical. The sentences would be grammatical without the particle *upp*.

6.2.3 The aspect marker *till*

The aspectual particle *till* denotes sudden, abrupt action:

(6.70) (a) *Hårt drar jag i handleden på henne, så att hon skriker* **till**,
hard pull I in wrist on her so that she screams to
skarpt, hårt, som jag aldrig har hört henne förr: -Släpp!
sharply hard as I have never heard her before let.go
'I suddenly pull her wrist hard, so that she yells out sharply: -Let go!' (PAR)

(b) *Varje litet ljud får mig att hoppa* **till**.
every little sound gets me to jump to
'Every little sound startles me.' (PAR)

(c) *Han blinkade* **till** *några gånger.*
he blinked to few times
'He blinked a few times.' (PAR)

(d) *Louise fnissade* **till**.
L. giggled to
'Louise giggled (once; suddenly)' (PAR)

Basically, *till* marks semelfactives. The lexical entry is given in (6.71):

(6.71) *till* P: (↑ ASPECT TELIC) = −
(↑ ASPECT DYNAMIC) = +
(↑ ASPECT DURATIVE) = −

Verbs that are inherently specified so that they conflict with (6.71) cannot coocccur with *till*:

(6.72) (a) **Dom* *där* *tycker* **om** *att* *förstöra* **till**.
they there like about to destroy to
intended: 'Those people like to destroy (suddenly)'.

(b) **Han* *vann* **till**.
he won to

The verb *förstöra* 'destroy' is [+ TELIC] and [+ DURATIVE] and thus incompatible with *till*. Similarly, *vinna* 'to win' is marked [+ TELIC] and cannot cooccur with the [− TELIC] *till*.

6.2.4 Remaining issues

This section has presented the three aspectual particles *på*, *upp* and *till*. I have classified them using aspectual features, represented in the f-structure. There is some reason to believe that the treatment given here is too simplistic. First of all, I have not addressed the fact that the particles put restrictions on the argument structure of the verbs they can cooccur with: *på* and *till* only go with intransitives, whereas *upp* goes with transitives.[17]

Second, the aspectual features provided by the particle sometimes yield the same featural specification as the aspectual features of the verb alone together with the default values. Consider (6.73), which does not contain a particle:

(6.73) *Eric* *dansade.*
E. danced
'Eric danced.'

The verb *dansa* 'to dance' is inherently marked [+ DYNAMIC] and [+ DURATIVE], but it is unmarked for telicity. In a sentence like (6.73), where no object or modifier contributes to the aspectual information, the telicity feature will receive a negative value. The aspectual specification for (6.73) is therefore (6.74):

[17] McIntyre (2001a) discusses particles in English and German which block syntactic linking of the direct object of the verb. See also Jackendoff (1997b, 2001a), who mentions the fact that particles can affect the argument selection.

(6.74) $\begin{bmatrix} \text{TELIC} & - \\ \text{DYNAMIC} & + \\ \text{DURATIVE} & + \end{bmatrix}$

This is exactly the specification that *på* contributes. It should therefore be pointless to add *på* to (6.73), but (6.75) is nontheless a perfectly fine sentence:

(6.75) *Eric dansade* **på**.
E. danced on
'Eric danced on.'

The fact that both (6.73) and (6.75) are felicitous is easily handled by the theory of aspect adopted here, since *dansa* and *på* do not involve conflicting feature values. However, these examples indicate that the particles contribute information beyond the simple aspectual features discussed here: *på* presumably adds some kind of information in (6.75).

The interaction of particles, verbs, and other words which contribute to the aspectual information is clearly quite intricate, and a full treatment is beyond the scope of this work. Nevertheless, this section has provided a first approximation of the role particles play in marking aspect in Swedish.

6.3 Idiomatic verb-particle combinations

In the two previous sections, we have discussed particles which add meaning to the clause in a compositional, predictable, and semantically transparent fashion. There are, however, semantically non-transparent particles. An example is given in (6.76):

(6.76) *Det är svårt att hålla* **av** *någon, som man inte kan lita på.*
it is difficult to hold off someone who one not can trust on
'It is difficult to like someone that you cannot trust.' (PAR)

The verb *hålla* 'to hold' and the particle *av* 'off, from' used in combination create the meaning 'to like'. The meaning is not transparent, since neither *hålla* nor *av* has anything to do with 'liking' when they are used on their own, and *hålla av* is thus a

verb-particle idiom. There are many such idiomatic verb-particle combinations, and we will see plenty of examples below.

This section is organized as follows: Section 6.3.1 provides more examples of idioms and also some examples of 'semi-idiomatic' verb-particle combinations; that is, verb-particle combinations which are partly transparent. This section also argues that there is no reason to posit a structural difference between idiomatic and non-idiomatic verb-particle combinations. Section 6.3.2 treats cases where a particle changes the argument structure of the verb. These cases will be considered semi-idiomatic. Finally, section 6.3.3 discusses the lexical representation of verb-particle idioms.

6.3.1 Idioms and semi-idioms

As we already saw in (6.76), verb-particle combinations are sometimes idiomatic. More examples are listed in (6.77):

(6.77)
- *bli* + *av* = become + off, 'happen, come about'
- *tycka* + *om* = think + about, 'like'
- *gå* + *bort* = go + away, 'die'
- *kasta* + *upp* = throw + up, 'vomit'

In (6.78), the verb-particle combinations of (6.77) are used in attested sentences:

(6.78) (a) *Den resa de har kämpat för ser inte ut att bli* **av**.
the trip they have fought for sees not out to become off
'It doesn't look like the trip they have been fighting for will happen.'
(PAR)

(b) *Erica berättar att hon spelar lite gitarr och tycker* **om** *att sjunga.*
E. tells that she plays little guitar and thinks about to sing
'Erica says that she plays a little guitar and that she likes to sing.' (PAR)

(c) *I år är det 20 år sedan Evert Taube gick* **bort**.
in year is it 20 years since E. T. went away
'This year, it has been 20 years since Evert Taube died.' (PAR)

(d) *Båda hade kastat* **upp**.
both had thrown up
'They had both thrown up.' (PAR)

The verb-particle combinations in (6.77) are completely idiomatic and must be stored as a unit in the lexicon. Across the Germanic languages, we find the same pattern: some verb-particle combinations are compositional and some are idiomatic (Ackerman and Webelhuth 1998, Wurmbrand 2000, Jackendoff 2001a). Ackerman and Webelhuth (1998) assume that *all* verb-particle combinations are stored as lexical units. Their argumentation is based on verb-particle idioms and show that the verb and the particle correspond to one lexical predicate. They assume that verb-particle combinations with compositional semantics are also best represented as a single predicate in the lexicon. Along the same lines of reasoning, all verb-object combinations are single lexical predicates, since that is what idioms like *kick the bucket* leads us to conclude. I hesitate to adopt this analysis, since many verb-particle and verb-object combinations can be successfully interpreted compositionally, and storing all combinations lexically seems redundant. However, most of the assumptions I make about the Swedish (and other) verb-particle combinations are in principle compatible with Ackerman and Webelhuth's approach.

There are degrees of idiomaticity within the verb-particle constructions (Wurmbrand 2000, Jackendoff 1997a). Consider the following examples:

(6.79) (a) *Alma körde* **ut** *honom ur köket för hon skulle baka.*
A. drove out him out.of kitchen.the for she would bake
'Alma kicked him out of the kitchen because she was baking.' (PAR)

(b) *Reine tog* **över** *Stigs förrätt och åt upp den också.*
R. took over S.'s appetizer and ate up that also
'Reine took over Stig's appetizer and ate that as well.' (PAR)

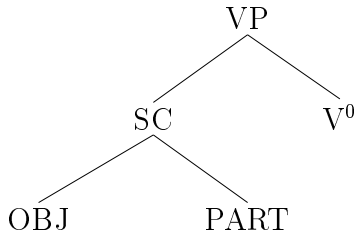
The expression *köra ut* in (6.79a) is idiomatic in the sense that it does not have to do with a driving activity.[18] However, it does involve the object going 'out', so in that

[18]The verb *köra* only has the reading 'to drive some vehicle'. It does not have the sense of drive that we find in examples like 'she drove him crazy', or 'a driving force'.

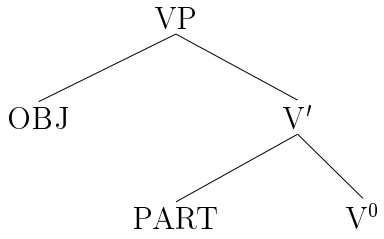
sense it is transparent. Consider also *ta över* in (6.79b). This expression does involve the act of 'taking', but it does not involve the notion 'over', and can also be considered semi-idiomatic. Even though these expressions are not 'fully' idiomatic, they must still be stored lexically together with their idiosyncratic meaning, since the meaning is not transparent.

Wurmbrand (2000) notes that some verb-particle combinations are idiomatic and others are not, and argues, based on German data, that the idiomatic verb-particle combinations are structurally different from the transparent ones (see (Ishikawa 1999) for a similar proposal for English). The structures she assumes (for German) are given in (6.80):

(6.80) (a) Transparent



(b) Idiomatic



Under Wurmbrand's analysis, the verb and the particle form a constituent in idioms, and the object and the particle form a constituent in non-idioms. As support for this hypothesis, she offers the following topicalization data, where (6.81a) is transparent and (6.81b) is idiomatic:

(6.81) (a) *?[Die Tür auf]*$_{SC}$ *hat nur der Hans* t_{SC} *gemacht.*
the door open has only the H. made
'Only John open the door.'

(b) **[Das Stück auf] haben nur die Philharmoniker t geführt.*
the piece PRT have only the Philharmoniker performed
'Only the Philharmoniker performed the piece.'

Although neither example is fully acceptable, most speakers reportedly prefer (6.81a) to (6.81b), and Wurmbrand takes this to be evidence for different structures. However, as Wurmbrand herself points out (2000:7-8), elements are fronted because they are topicalized or focussed, and topic and focus can only be expressed by elements that have compositional semantic content. Consider the following sentence from English:

(6.82) *The bucket is what John kicked.*

The sentence in (6.82) is only grammatical on the non-idiomatic reading. It is a general fact that idiom chunks which cannot be interpreted compositionally cannot be fronted The examples in (6.81) are therefore not convincing evidence for the structures in (6.80).[19]

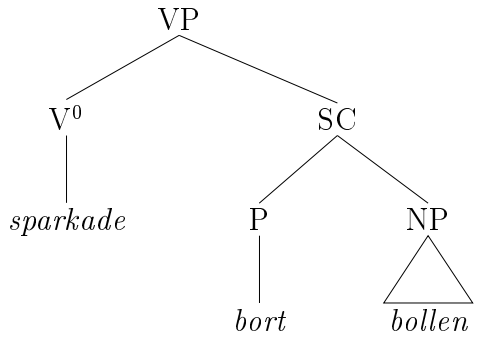
Let us take a closer look at the constituency evidence, using examples from Swedish. If we adopt Wurmbrand's analysis, the VP structure for a non-idiomatic verb-particle combination such as the one in (6.83a) would be (6.84a), and the structure for the idiom in (6.83b) would be (6.84b):

(6.83) (a) *Flickan sparkade* **bort** *bollen.*
girl.the kicked away ball.the
'The girl kicked the ball away.'

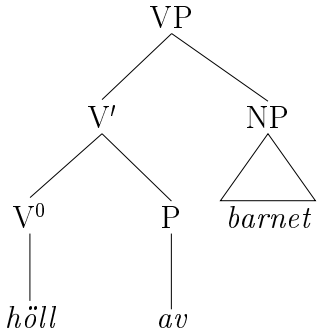
(b) *Flickan höll* **av** *barnet.*
girl.the held off child.the
'The girl liked the child. '

[19]See Nunberg, Sag and Wasow (1994), who discuss the fact that some idioms can be interpreted compositionally whereas others cannot. The 'semi-idioms' in (6.79) are examples of verb-particle combinations which are not semantically tranparent, but can nontheless be interpreted compositionally. Pitt and Katz (2000) also discuss compositional idioms.

(6.84) (a)



(b)



According to the representations above, *bort* and *bollen* form a constituent and *höll* and *av* form a constituent. Let us first test the constituency of *bort bollen*:

(6.85) (a) *?**Bort* *bollen* *sparkade* *flickan.* *(non-idiom)*
away ball.the kicked girl.the

(b) **Av* *barnet* *höll* *flickan.* *(idiom)*
off child.the held girl.the

Both examples are bad, but a topicalization of *bort bollen* is marginally better than a topicalization of *av barnet*. Although this data is by no means clear, it seems to confirm the structural assignment proposed in (6.84).

Let us now look at *sparkade bort* and *höll av*. The former is not supposed to form a constituent, while the latter is:

(6.86) (a) *%Sparkade* **bort** *gjorde* *hon* *bollen.* *(non-idiom)*
kicked away she did ball.the
'Kick away she did the ball.'

(b) **Höll* **av** *gjorde* *hon* *barnet.* *(idiom)*
held off did she child.the
'like she did the child.'

The data in (6.86) do not confirm the predictions of (6.84). The example in (6.84b) is clearly ungrammatical, but some speakers accept (6.86a), and everybody seem to prefer (a) to (b). I conclude that there is no reason to assume a structural difference between idiomatic and non-idiomatic verb-particle combinations, at least not in Swedish.[20] The data in (6.85-6.86) do, however, fall under the generalization that chunks of idioms are harder to front than parts of non-idioms.

6.3.2 Argument structure

When a verb is used together with a particle, the number and type of NP arguments may be different from the number and type of arguments that the verb takes alone. The aspectual *på*, which was discussed in section 6.2.1, can never cooccur direct object, no matter which verb it is combined with, so sometimes the number of arguments is predictable. However, it is often not possible to predict what the addition of a particle will do to the argument structure. When the argument structure of a verb-particle combination seems arbitrary, I classify that verb-particle combination as semi-idiomatic.[21]

Let us begin by looking at the verb *skälla* 'to bark, to scold' as an example. If it is used without a particle, it is intransitive (6.87a), with an optional PP argument (6.87b). However, in combination with the particle *ut* 'out' or *down* 'ner', it is transitive, and means 'to yell at' or 'to scold', as in (6.87a–b):

(6.87) (a) *Jag kunde inte hejda mig själv, jag bara skrek och skällde, och jag tror att jag stampade i golvet också.*
I could not stop me self I just screamed and scolded and I think that I stomped in the floor also
'I couldn't stop myself, I just yelled and screamed and I think I stomped my feet as well.' (PAR)

(b) *... så vände han sig om för att skälla på mig.*
then turned he himself around for to bark on me
'...then he turned around to scold me.' (PAR)

[20] See McIntyre (2001b) for German-internal arguments against Wurmbrand's analysis.

[21] Of course, it can also be *fully* idiomatic, depending on whether the meaning of the parts of the construct is transparent.

(c) *Chefen* *skällde* **ut** *honom.*
boss.the barked out him
'The boss scolded him.' (PAR)

(d) *Konrad* *vart* *alldeles* *stel* *i* *ansiktet* *och* *så* *skällde* *han*
K. got completely stiff in face.the and then barked he
ner *Frida.*
down Frida.
'Konrad got all stiff in the face and then he scolded Frida.' (PAR)

(e) **Hon* *skällde* *honom.*
she barked him
intended: 'She scolded him.'

The list of syntactic arguments for *skälla*, without a particle is given in (6.88a), the arguments for *skälla ut* is in (6.88b), and *skälla ner* is in (6.88c):

(6.88) (a) *skälla:* <SUBJ (OBL$_{pa}$)>

(b) *skälla - ut:* <SUBJ OBJ>

(c) *skälla - ner:* <SUBJ OBJ>

Consider also the examples in (6.89), which all include the verb *hänga* 'to hang':

(6.89) (a) *Jag* *hängde* *jackan* *på* *väggen.*
I hung jacket.the on wall.the
'I hung the jacket on the wall.'

(b) *Jag* *hängde* **på** *generalen* *medaljen.*
I hung on.PRT general.the medal.the
'I hung the medal on the general.'

(c) *Jag* *hängde* *medaljen* *på* *generalen.*
I hung medal.the on general.the
'I hung the medal on the general.'

(d) **Jag* *hängde* **på** *väggen* *jackan.*
I hung on wall.the jacket.the

When it is used without a particle, the verb *hänga* takes an NP object and a PP, 'to hang something on something'. However, the verb can also be used with the particle *på*, as we see in (6.89b).[22] In that case, two NP objects are necessary. There are, however, further restrictions: when the particle *på* is used, the recipient of the 'hanging' must be animate.[23] Since *väggen* is inanimate, (6.89d) is ungrammatical.

Let us consider another example:

(6.90) (a) *dricka* *vinet/*glaset*
drink wine.the/*glass.the

(b) *dricka* **ur** *vinet/glaset*
drink out/empty wine.the/glass.the

The verb *dricka* requires that its NP object be a liquid (ignoring here metaphorical uses of the verb). If we add the particle *ur*, which means 'out', 'empty' or 'finished', however, two types of NP objects are allowed: either liquids (like with the plain *dricka*) or containers (see also Norén for discussion of these examples).[24]

The examples in (6.87-6.90) show that a verb in combination with a particle can take different arguments than the verb alone. The difference might be in type or in number. The changes in argument structure are not predictable: it is not the case that any specific particle always requires a specific number (or kind) of arguments. Take *på* as an example: in (6.91a), a verb + *på* takes one argument, in (6.91b-c), a verb + *på* takes two arguments, and in (6.91d) a verb + *på* takes three arguments:

[22]Note that this is not the aspectual *på*, which was discussed in section 6.2.1.

[23]The restriction is a bit more complicated than this. You can use *hänga på* with an inanimate object if that object is a statue, for example. It is also possible that not *all* animates can be used.

[24]Daniel Ormelius (p.c.) has pointed out to me that an example like 'he drank the whole glass in five minutes' is acceptable since a possible interpretation is 'the liquid contained in the glass' (see (Apresjan 1973, Ostler and Atkins 1992)). The discussion of the examples in (6.90) is therefore a bit too simplistic. The main generalization does, however, hold true: the particle changes the selectional restrictions of the verb.

(6.91) (a) *Vispa* **på** *bara!*
whip on only
'Just keep on whipping!' (PAR)

(b) *Han fyllde* **på** *sitt glas.*
he filled on his glass
'He filled his glass.' (PAR)

(c) *Jag bättrade* **på** *ögonmake-upen.*
I improved on eye.make.up.the
'I improved my eye make-up.' (PAR)

(d) *... vi ska tävla om vem som först kan klä* **på** *den stackars suggan en huvudbonad.*
we shall compete about who that first can dress on the poor sow a head.clothing
'We will compete about who can first put a hat on the poor sow.' (PAR)

The examples in (6.91) show that a given particle does not in general *force* a particular argument structure. We see clearly that it is not the case that *på* has to cooccur with a given number of arguments. The examples in (6.92) shows that the same thing holds true for the particle *ut*:

(6.92) (a) *Kalle kände sig provocerad men bestämde sig för att stå* **ut**.
K. felt self provoked but decided self for to stand out
'Kalle felt provoked but decided to put up with it.' (PAR)

(b) *... och blåste* **ut** *ett doftande moln av blå rök mot henne.*
and blew out a smelling cloud of blue smoke towards her.
'...and blew out a smelly cloud of blue smoke at her.' (PAR)

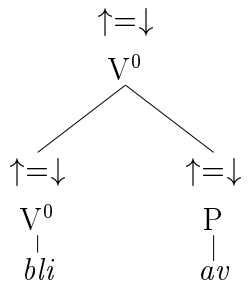
The particle *ut* can be used with one or two arguments: example (6.92a) is intransitive, and (6.92b) is transitive. As far as I can tell, the number of arguments must be memorized in examples like the ones in (6.91-6.92). The verb *vispa* in (6.91a) without a particle takes two arguments, *fylla* also takes two arguments, *bättra* without a particle has to take a reflexive object, *klä* and *känna* normally take two arguments, and *blåsa*

takes a single argument. These are the facts, and I have not been able to detect a clear pattern, except for the fact that the aspect particles *upp* and *på* come with restictions on the number of arguments, as we saw in section 6.2. I suspect that there are more such subregularities to be found, but I leave this for future research.

6.3.3 Discussion

Sometimes it seems natural to analyze an idiomatic particle as a co-head of the verb, rather than as an XCOMP. Consider *bli av* 'to happen' and *tycka om* 'to like' (given in (6.77-6.78)), for example. The particles in those examples do not seem to be any kind of secondary predicate, since it is not the true that anyone or anything is 'off' in the former example, or 'about' in the latter. In those cases, it seems better to analyze them as co-heads:

(6.93)



Here, the verb and the particle form a complex predicate. Different ways to formalize complex predicates in LFG (or in a framework compatible with LFG) are discussed in Butt (1995), Ackerman and Webelhuth (1998), and Andrews and Manning (1999).

In the first two sections of this chapter, I discussed resultative and aspectual particles. I have divided this chapter into three main sections for the sake of clarity, but there are clearly overlaps between different types of particles. Some particles can be part of an idiomatic verb-particle complex, but they still denote the result in some (often figurative) sense. Consider the English *pass away*, which is for our purposes parallel to the Swedish *gå bort*. The verb *pass* can be thought of as denoting some kind of departure, and *away* can mean away from life, or away from here. In that sense, the result of the subject's dying is that s/he is 'away'. If we decide that this is the best way to analyze 'pass away', then 'away' should be an f-structure XCOMP, not a simple co-head.

Let me spell out the details for how this would work, using the Swedish idiom *gå bort* 'to die' (lit. 'to walk away') as an example. We need two lexical entries for the verb *gå*, one for the literal reading, and one for the *gå* that participates in the idiom. The lexical entry for *gå* will be something like (6.94):

(6.94) *gå*, V^0: $(\uparrow \text{PRED}) = \text{'}walk_1 <(\uparrow \text{SUBJ}_1)(\uparrow \text{XCOMP}_2)>\text{'}$

$$\textbf{LCS:} \begin{bmatrix} \text{GO } ([1\ ]_A,\ [2]_{(A)}) \\ \textit{content} \end{bmatrix}$$

The verb *gå* takes two arguments, an agent and a path. The subscript A on the first argument indicates that the argument must be realized, and (A) means that the argument is optionally realized.

Each verb has its own idiosyncratic semantic flavor; where by semantic flavor I mean the part of the meaning that distinguishes *gå* from verbs like *springa* 'to run' and *promenera* 'to take a walk.' Those verbs are all motion verbs and they have the same argument structure, but they do not mean exactly the same thing. This part of the verbal semantics is not included in the LCS representations here; I just mark it with *content*.

When *gå* is used in the idiom *gå bort*, the phonology and the morphology of the verb does not change. What is special about *gå* in this idiom is (a) it obligatorily takes the oblique *bort*, and (b) it shares the LCS of the verb *dö* 'to die':[25]

(6.95) *gå*, V^0: $(\uparrow \text{PRED}) = \text{'}walk_2 <(\uparrow \text{SUBJ})(\uparrow \text{XCOMP})>\text{'}$
$(\uparrow \text{XCOMP FORM}) =_c \text{BORT}$

$$\textbf{LCS:} \begin{bmatrix} \text{DIE } ([\quad]_A) \\ \textit{content} \end{bmatrix}$$

The idiomatic *gå* has a pointer to the contentless *bort* form:

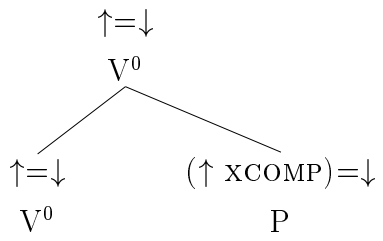
(6.96) *bort*, P: $(\uparrow \text{FORM}) = \text{BORT}$

[25] I use the notation of Kaplan and Bresnan (1982) to specify that the particle used is necessarily 'out'. See also section 7.3.3.

This is a simple way of formalizing idioms in LFG (Kaplan and Bresnan 1982), but nothing hinges this specific formalization: the main point here is that the expression *gå bort* shares lexical semantics with *dö*.[26]

Whether or not *gå bort* is used idiomatically, the c-structure representation will be:

(6.97)



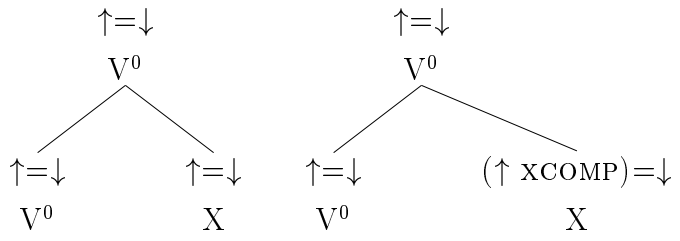
The particle is still a non-projecting word in the c-structure, attached to V^0.

6.4 Summary

This chapter divided particles into three major categories based on their semantic interpretation. I proposed that a Swedish verbal particle is a resultative predicate, an aspect marker, or part of an idiomatic verb-particle combination.

The architecture of LFG does not force a given c-structural position to always correspond to the same f-structure function. For example, the specifier position of CP in alanguage may be able to host an element with has either the topic or the focus function. I have claimed that the particle position in Swedish can host both a co-head and an XCOMP (though not simultaneously, of course). So both of the following annotations are possible:

(6.98)



[26]See Ackerman and Webelhuth (1998), Webelhuth and Ackerman (2001) for a different way of formalizing idioms in LFG.

As a consequence, all and only non-projecting words which are co-heads or XCOMPs can appear in the particle position in Swedish.

I finally want to point out that no matter what their semantic function is, verbal particles always have the characteristics pointed out in chapters 1 and 2: they are stressed; they cannot have complements; and if they are modified, they must follow the direct object. Swedish verbal particles thus have the same simple structure no matter what their meaning is: they are always adjoined to the verbal head.

Chapter 7

Other Germanic languages

All Germanic languages have words that correspond to the Swedish verbal particles, and it is well-known that particles display cross-linguistic differences.[1] The most obvious difference has to do with the word order: in some languages, particles must precede the object; in some they must follow the object; and in others they either precede or follow the object. This is shown in (7.1-7.3):

(7.1) *Vi* *släppte* **ut** *hunden.*
we let out dog.the
'We let the dog out.'

(7.2) *Vi* *slap* *hunden* **ud**.
we let dog.the out
'We let the dog out.'

(7.3) (a) *We let* **out** *the dog.*

(b) *We let the dog* **out**.

The examples above illustrate the divergence in word order across languages, but there are also other differences, as I will show in this chapter.

An exhaustive treatment of all the Germanic languages is obviously beyond the scope of this work. I will limit my discussion to Danish, German and English, which represent

[1] Many of the relevant references are included in this work. See also Dehé et al. (2001), Zeller (1999), Müller (2000) and references cited in those works.

three different patterns. We will see that Danish and German are easily accounted for within our current framework. English, however, poses several interesting problems, and most of this chapter is therefore devoted to English.

7.1 Danish

I begin with Danish, which displays a pattern that is in a sense the opposite of the Swedish pattern, since the (apparent) particles necessarily follow the direct object. This is shown in (7.4) which is taken from Svenonius (1994, chapter 3), and (7.5) which is taken from Platzack (1998: 179):

(7.4) (a) *Vi slap hunden ud.*
we let dog.the out."PRT"
'We let the dog out.'

(b) **Vi slap ud hunden.*
we let out."PRT" dog.the

(7.5) (a) *Han knugede sine hænder sammen.*
he clasped his hands together."PRT"
'He clasped his hands.'

(b) **Han knugede sammen sine hænder.*
he clasped together."PRT" his hands

Compare the example in (7.4) to the Swedish example in (7.6):

(7.6) (a) *Vi släppte* **ut** *hunden.*
we let out dog.the
'We let the dog out.'

(b) **Vi släppte hunden ut.*
we let dog.the out

Recall that the particle in Swedish necessarily precedes everything in the VP except the verb itself. It crucially precedes the direct object. Danish displays the opposite pattern: the particle *follows* the direct object. According to my analysis of Swedish, particles are non-projecting words which are head-adjoined to V^0, and the word order is thereby

explained. Since Danish objects can intervene between a verb and a particle, Danish appears to provide counterevidence for the present analysis of particles.

I propose that Danish in fact does not have verbal particles at all (under the definition where particles are non-projecting words). Although the words *ut* and *sammen* in (7.4-7.5) above correspond closely to the Swedish particles in meaning and form, I suggest that they differ in that they *do* project full phrases. The lexical entry for *ud* 'out' is then (7.7):

(7.7) *out*: P^0 (↑ PRED)='out'
(↑ CASE)=OBL

It then follows that *ud* must obey the word order restrictions for PPs in Danish, and as (7.8) shows, PPs follow direct objects in Danish (Bredsdorff 1970:141-142):

(7.8) (a) *Han har lært det [$_{PP}$ af sin far].*
he has learnt it from his father
'He has learnt it from his father.'

(b) *Jag fandt brevet [$_{PP}$ blandt mine papirer].*
I found letter.the among my papers
'I found the letter among my papers.'

Although Danish has many intransitive prepositions that correspond to verbal particles in Swedish and the other Germanic languages, it does not have particles in the structural sense, since prepositions in Danish must always project phrases. This claim is supported by the fact that all particles appear to be modifiable in Danish (so long as a modification is semantically plausible). Two modified particles are given in (7.9). Example (7.9a) is from Bredsdorff (1956) and (7.9b) is adapted from from Herslund (1984):

(7.9) (a) *Han var langt borte.*
he was far away."PRT"
'He was far away.'

(b) *De sendte ham langt ud på landet.*
they sent him far out."PRT" on countryside.the
'They sent him far out into the countryside.'

The assumptions laid out in chapter 4 force an anlysis where the post-object prepositions in Danish project full phrases. There is no reason to assume that they do not project, and the modification data suggests that they do. See also Herslund (1984), who adopts an analysis where the Danish 'particles' are PPs.

7.2 German

There is a long-standing debate in the German syntax literature concerning the status of verbal particles: are they phrasal or affixal?[2] Just as in Swedish, the particles seem phrasal in that they can be separated from the verb, and affixal in that they cannot be modified. The analysis developed for Swedish accounts for these characteristics in a simple way, and I therefore assume the same analysis for German.

Consider the examples in (7.10):[3]

(7.10) (a) *Hans warf seinen Mitarbeiter* **hinaus**.
H. threw his employee out.
'Hans fired his employee.'

(b) *Hans möchte seinen Mitarbeiter* **hinaus**-*werfen.*
H. wants his employee out-throw
'Hans wants to fire his employee.'

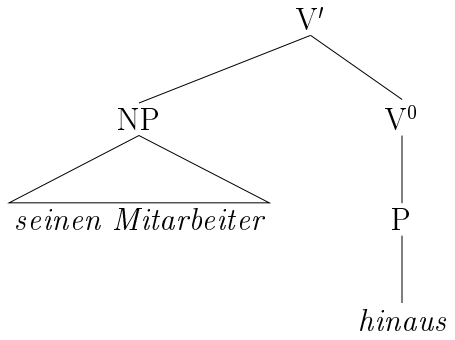
Like Swedish, German is a verb-second language, so the finite verb appears outside the verb phrase in some higher functional projection in matrix clauses (7.10a). Non-finite verbs, however, appear within the VP, which is verb final (7.10b).

Following the present assumptions, the VP structure of (7.10a) is (7.11), and the structure of (7.10b) is (7.12):

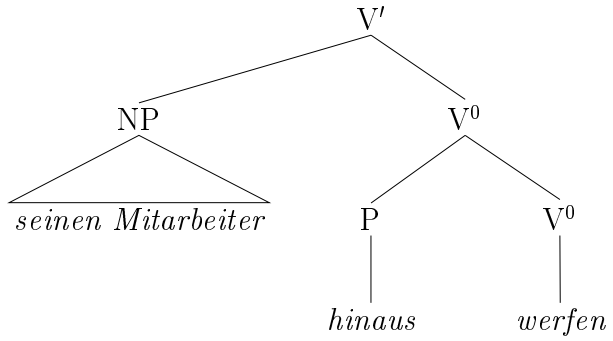
[2]See Stiebels and Wunderlich (1994), Zeller (1999) and Lüdeling (2001) for discussions of this debate, and for further references.

[3]The example in (7.10a), as well as the examples in (7.13) below, are adapted from Wurmbrand (2000).

(7.11)



(7.12)



The German structures are identical to the corresponding Swedish ones, except for the fact that the ordering of elements differs, since Swedish is not verb-final.

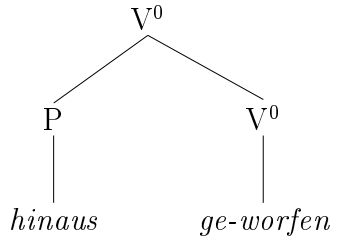
When a particle and a verb appear next to each other in the VP, they are written as a single word in German. There is, however, evidence that they do not form a morphological unit. First of all, the two can be separated, as we saw in (7.10a). The second piece of evidence comes from inflectional affixes:

(7.13) (a) *Hans har seinen Mitarbeiter* **hinaus**-*ge-worfen.*
H. has his employee out-PCPLE-thrown
'Hans has fired his employee.'

(b) **Hans hat seinen Mitarbeiter ge-***hinaus***-***worfen.*
H. has his employee PCPLE-out-thrown

Inflectional affixes, such as the participle marker *ge-*, must come in between the particle and the verb. This follows naturally, if we assume the structure in (7.14), parallel to (7.12) above:

(7.14)



The data in (7.13) does not provide clear-cut evidence for the present proposal, since inflection sometimes does show up word-internally cross-linguistically (see section 7.3.2). However, the data in (7.13) are certainly expected under the analysis proposed here for German.

German also has inseparable prefixes, which are always adjacent to the verb (even in V2 clauses). These do not pose a problem for our proposed structure of the separable particles. Consider (7.15), which includes the prefix verb *verkaufen* 'to sell':

(7.15) (a) *Er ver.kaufte das Buch.*
he PREFIX.sold the book
'He sold the book.'

(b) **Er kaufte das Buch ver.*
he sold the book PREFIX
'He sold the book.

As (7.15) shows, the prefix *ver-* cannot be separated from the verb. Following Zeller (1999), I assume that the prefixes are morphologically attached to the verb. Since *verkaufen* is a morphological word, a syntactic separation of *ver* and *kaufen* is impossible by the principle of Lexical Integrity, which was discussed in section 2.3 above.

In German, it is difficult to distinguish verbal particles from other secondary predicates. Compare the verb-particle example in (7.16a) to the resultative in (7.16b) (Lüdeling (2001)):

(7.16) (a) *daß Dornröschen das Buch* **an**-*liest.*
that Sleeping.Beauty the book on-reads
'that Sleeping Beauty begins to read the book.'

(b) *daß der Prinz Dornröschen wach küßt.*
that the prince Sleeping.Beuty awake kisses
'that the Prince kisses Sleeping Beuty awake.'

In V2 clauses, *an* is left behind, and so is *wach*. It is difficult to establish a clear-cut criterion which can help distinguish between the two, especially since the German particles are similar to the Swedish ones in that they do not form a uniform class with respect to grammatical function, semantics or syntactic category. This leads Lüdeling (2001) to conclude that the verbal particles do not form a separate linguistic class. However, she notes that native speakers separate out particles as a distinct category (Lüdeling 2001:163):

> "Even though we saw that no class of particle verbs can be distinguished, what remains to be explained is that speakers of German have the intuition that there is such a class. I must admit that I do not have a true explanation for this and can merely speculate. The intuition really is that in the case of particle verbs the preverb and the verb are somehow more closely connected that they are in other PVCs [preverb verb constructions -IT]."

Lüdeling is left without a formal way of capturing the intuition she mentions. However, the c-structural representations assumed here capture the intuition naturally: particles are head-adjoined to the verb, and other preverbs are not.

There is a reason why it is more difficult to recognize the structural difference between particles and other preverbs in German than it is in Swedish. The crucial difference between the two languages is the word order. In Swedish, it is clear that the particles differ from constituents such as 'awake', since the particles necessarily precedes the direct object, as we have seen in numerous examples above. Swedish thus provides clear evidence for a structural difference, whereas the German evidence is weak. However, there is some German-internal evidence as well. Consider the examples in (7.17) (Lüdeling (2001)):

(7.17) (a) *daß der Prinz ins kalte Wasser* **hinein**-*springt.*
that the prince in cold water into-jumps
'that the prince jumps into the cold water.'

(b) *daß Jan das Zimmer grün* **aus**-*malt.*
that J. the room green out-paints
'that Jan paints the room green.'

Note the ordering of *ins kalte Wasser* and *hinein*. If both are XPs attached to V′ (as proposed by Lüdeling 2001), then the fact that *hinein* must follow *ins kalte Wasser* would be accidental. Under the present analysis, the ordering is explained by the fact that *hinein* is head-adjoined to V^0.[4]

Lüdeling's failure to discover what I believe to be the correct analysis of the German particles depends upon two factors. One is that the German word order makes the data less clear than the Swedish data. The other is that she assumes that the function of words and phrases is tied to the phrase structure. This confusion is avoided in LFG, where structure is explicitly separated from function.

7.3 English

English, Norwegian, and Icelandic are similar in that they allow particles (or elements that correspond to the Swedish particles) to occur either before or after the direct object. This section focusses on English. The optionality is problematic within the current proposal, since the post-object 'particle' should always be ruled out by Economy. In this section, I first lay out the problem, and then I propose a solution: I treat English verb-particle combinations as morphological constructs.

Section 7.3.4 discusses the complex particle construction, which involves an apparent paradox. However, I will provide independent evidence that the complex particle

[4]Paul Kiparsky (personal communication) points out a further fact that could be viewed as evidence that particles are head-adjoined in German: two particles cannot cooccur, as shown by the examples below:
(i) **dass er* **Auto weg**-*fährt*
(ii) **dass er* **weg Auto** *fährt*
that he drives (car) away
Under the present analysis, the data in (i-ii) can easily be accounted for with a constraint that at most one word can head-adjoin to V^0 in German.

construction is a *constructional idiom*, and under this analysis, the paradox disappears.

7.3.1 Optionality

In English, particles can either precede or follow the direct object:

(7.18) (a) *John threw out the garbage.*

(b) *John threw the garbage out.*

(7.19) (a) *We let in the dogs.*

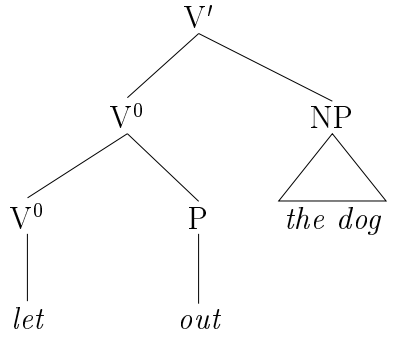
(b) *We let the dogs in.*

This optionality is problematic for the present view of particles. In order to see where the problem lies, let us consider the preposition *out*. Assuming that the analysis given for Swedish extends to English, the lexical entry for *out* is (7.20):

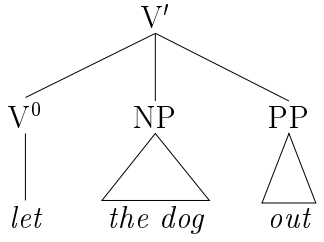
(7.20) *out*: $P^{(0)}$ (↑ PRED)='out'
(↑ CASE)=OBL

The preposition *out* is optionally projecting. When it does not project, it is head-adjoined to V^0 (7.21), and when it does project, it is a sister of V^0 and follows the NP, like other PPs (7.22):

(7.21)



(7.22)



The lexical entry in (7.20) allows both (7.21) and (7.22).

We now have a problem: the Economy principle (repeated below) should rule out (7.22):

(7.23) **Economy of Expression**
All syntactic phrase structure nodes are optional and are not used unless required by X′-constraints or completeness.

Recall from chapter 4 that the Economy principle disfavors structure that does not add any information to the f-structure. Since (7.22) includes more structure than (7.21), (7.22) should be ruled out, but it is grammatacal.

The English facts have long puzzled syntacticians. Here we have a case of syntactic optionality, and optionality is problematic. Åfarli (1985) discusses this optionality in Norwegian, and he argues that the [V Prt O] word order is only possible when the verb and the particle form a causative construction. If Åfarli is correct, then there is a difference in meaning between a sentence where the particle position is filled by a P, and a sentence where the object is followed by a projecting P^0. It is then possible that there is a meaning difference in English as well between sentences where the particle precedes the object and sentences where the particle follow the object. If this is correct, the particles do not involve true optionality. Such a meaning different is difficult to prove in English, but several other extra-syntactic factors have been shown to influence the particle placement (see the careful discussion in Gries 1999, 2001). Influencing factors include: stress of the direct object, length/complexity of the direct object, modification of the noun or the verb, news value of the direct object, and distance to the next mention of the direct object (Gries 1999, 2001, Chen 1986, Fraser 1974, Bolinger 1971, and others). It is thus clear that a complete account of the particle placement in English involve factors other than syntax. I will, however, put these important non-syntactic considerations aside and focus on the fact that the syntax allows the particle to appear on either side of the direct object in English.

7.3.2 Complex verbs

We have seen that the English and the Swedish verb-particle combinations differ in that English particles can optionally follow the direct object. Another important difference is the fact that English particles that immediately follow the verb seem to have a tighter connection to the verb than Swedish particles do. In Swedish, the verb can be separated from the particle, as has already been shown in many verb-second examples above. Some conjunction examples are given in (7.24):

(7.24) (a) *Han ville kasta* **in** *kläderna och* **ut** *skorna.*
he wanted throw in clothes.the and out shoes.the
'He wanted to throw the clothes in and the shoes out.'

(b) *Tokyo och Washington har således ett gemensamt intresse av att få* **upp** *dollarn och* **ner** *yenen.*
T. and W. have thus a common interest of to get up dollar.the and down yen.the
'Tokyo and Washington thus have a common interest in getting the dollar up and the yen down.' (PAR)

(c) *Då tog hon* **opp** *källarn och* **ner** *vinden...*
then took she up basement.the and down attic.the...
'The she brought the basement up and the attic down...' (PAR)

In the examples in (7.24), the verb is gapped, so the second particle is not immediately adjacent to a verb.

The verb can never be separated from the pre-object particle in English (McCawley 1988). Consider the conjunction data in (7.25):[5]

(7.25) (a) **John picked up the money and out a coin.*

(b) *John picked up the money and picked out a coin.*

It is not possible to gap the second verb in (7.25). However, gapping is possible when the particles *follow* the objects:

[5]Examples (7.25-7.26) and (7.29-7.30) are taken from McCawley 1988:64-65. See also den Dikken 1995:126.

(7.26) *John threw the money up and a coin out.*

Svenonius (1994, Chapter 3) offers the following additional examples:

(7.27) (a) *Pauline turned the acetylene on and the oxygen off.*

(b) **Pauline turned on the acetylene and off the oxygen.*

(7.28) (a) *Try to hold your hands up and your elbows down.*

(b) **Try to hold up your hands and down your elbows.*

The examples above show clearly that a pre-object particle must be immediately adjacent to the verb in English.

Consider also the right-node-raising example in (7.29):

(7.29) (a) **John picked, and Mary hoisted, up some heavy weights.*

(b) *John picked up, and Mary hoisted up, some heavy weights.*

In (7.29), we see that the verb cannot be separated from the particle. Compare (7.29) to (7.30):

(7.30) *John picked, and Mary hoisted, some heavy weights up.*

Examples (7.29a) and (7.30) differ in word order: in (7.29a), the particle precedes and in (7.30) the particle follows the object. We see again that the pre-object particle must be immediately adjacent to the verb in English, although this is not true in Swedish.

Let us finally consider the examples in (7.31):[6]

(7.31) (a) *Pauline turned the acetylene on and off.*

(b) **Pauline turned on and off the acetylene.*

Again, there is a difference in grammaticality dependeing on whether the particles precede or follow the direct object.[7] The tight connection between the verb and the particle is explained if we assume that the words are lexically combined.[8] English verb-particle sentences such as those in (7.32) then have the structures in (7.33-7.34):

[6]These data were pointed out to me by Paul Kiparsky, p.c.

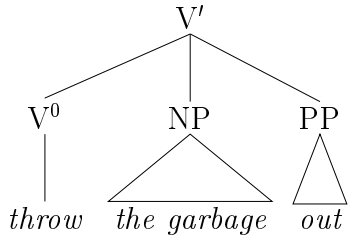
[7]Some speakers find (7.31b) marginally acceptable. That is not a problem for my analysis, since people can also say things like *a pre- or a post-doc*.

[8]Thanks to Joan Bresnan for first pointing out this possibility to me.

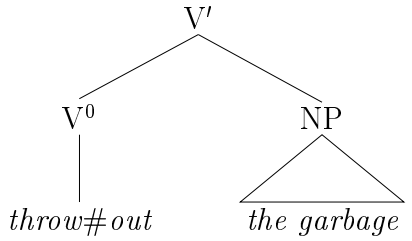
(7.32) (a) *throw the garbage out.*

(b) *throw out the garbage.*

(7.33)



(7.34)



Under this analysis, English is like Danish in that there are no non-projecting words in the syntax. However, in English, a verb and a particle can combine lexically and be inserted as a morphological unit into the c-structure. Economy of Expression is no longer a problem, since (7.33) and (7.34) involve different lexical forms.

There are some potential counterarguments to an analysis which assumes that the pre-object particle is lexically combined with the verb. As discussed in section 2.3 above, when a Swedish particle is combined with a verb lexically, the constructed word is always head-final, but the English verb-particle combinations are clearly not head-final. This is not a problem, however, since English generally differs from Swedish in this respect. Consider the following examples:

(7.35) (a) *a cut-up cake*

(b) *a thrown-away mug*

(c) *stand-upper*

The verb-particle compounds in (7.35) are uncontroversially considered lexical constructs, but they are not verb-final. The word-order by itself is therefore not a reason to reject the hypothesis that English verb-particle combinations are lexically formed.

Another possible objection to the analysis presented here concerns inflectional morphology, which shows up in the middle of the word:

(7.36) (a) *kick#out*

(b) *kick***s***#out*

(c) *kick***ed***#out*

However, as pointed out by Bresnan (1982c),[9] this is not a problem, since in English we find morphological marking within other compounds as well:

(7.37) (a) *a wiped-away smile*

(b) *a sold-out show*

(c) *brothers-in-law*

(d) *passers-by*

In (7.37), the morphological marker is found on the head of the compound, even though the compounds are not head-final. The pattern found in (7.37a-b) is productive,[10] and note also that word-internal inflectional morphology is not uncommon cross-linguistically. Consider the Italian examples in (7.38) (Scalise 1992:188):

(7.38) (a) *capo.stazione*
master.station
'station-master'

(b) *capi.stazione*
masterPL.station
'station-masters'

Italian allows the plural to be marked word-internally, so in (7.38), *capi* is in the plural, but *stazione* is not.

[9]Bresnan's discussion covers verb-preposition combinations such as *march through, pay for* and *go over*.

[10]For a thorough discussion of complex *-er* nominals, see Ryder 2000. See also Jespersen (1961:236), who cites naturally occurring examples such as the following: 'there is a school of *speakers out*'.

The lexical analysis presented in this section explains the differences between Swedish and English. Another advantage of this analysis is that certain expressions in English only allow one of the two ordering possibilities. Consider the examples in (7.39-7.40), taken from Jackendoff (2001a):

(7.39) (a) *Harold sang/whistled/jogged his heart* out.

(b) *Richard ran/programmed/cooked/yelled his head/butt* off.

(c) *Kelly wrote/slept/drew/edited* up *a storm.*

(7.40) (a) **Harold sang* out *his heart.*

(b) **Richard cooked* off *his head.*

(c) **Kelly edited a storm* up.

The analysis laid out here makes it easy to state the necessary word order restriction on the expressions in (7.39). Take the expression in (7.39a), for example. The generalization can be stated either as (7.41a) or (7.41b):

(7.41) (a) Only syntactically independent *out* can participate in the *verb-pro's-heart-out* idiom.

(b) Only simple verbs (verbs which are not lexically combined with a particle) can participate in the *verb-pro's-heart-out* idiom.

On the present view, a particle which follows the object is formally different from one which precedes it, since one is syntactically independent and the other is not. Likewise, a simple verb is different from a complex one, and we therefore expect them to differ in behavior. Stating the differences explicitly can help us formalize expressions such as the ones in (7.39). In short, the data in (7.39-7.40) fall naturally out of the analysis presented in this section.

7.4 The complex particle construction

We will now turn to the English *complex particle construction* (CPC). The CPC includes two NPs and a 'particle' (i.e., a preposition), which are strictly ordered. Examples are given in (7.42); (7.42a) is taken from Sag (1987), and (7.42b) is from Kayne (1985):

(7.42) (a) *I sent the men out flowers.*

(b) *They handed John down the tools.*

The CPC has received a lot of attention in the literature (Jackendoff 1977, Kayne 1985, Sag 1987, den Dikken 1995), and it has proven difficult to analyze for several reasons. A major problem is the fact that there is great dialectal variation concerning the grammaticality of CPC sentences. Some speakers do not like them at all, and others only accept them if the first NP is a pronoun. In addition, there are some speakers that allow the particle to precede the first NP, at least in some examples:

(7.43) (a) *%I sent out the men flowers.*

(b) *%They handed down John the tools.*

The discussion here will be based mainly on data and judgements cited from the literature (although the judgements among authors vary), but I will also report some results of a preliminary corpus search.

Many speakers reject a modified preposition:[11]

(7.44) (a) **I sent the men right out flowers.*

(b) **They handed John right down the tools.*

Some speakers allow modification of the preposition if the word order is that of (7.45):

(7.45) (a) *%I sent the men flowers right out.*

(b) *%They handed John the tools right down.*

However, speakers seem to uniformly reject (7.46):

(7.46) (a) **I sent the men flowers up.*

(b) **They handed John the tools down.*

[11]Some speakers I have consulted accept the sentences in (7.44). I will discuss this below.

In sum, the preposition in the CPC must come in between the two NP objects, and it cannot be modified.

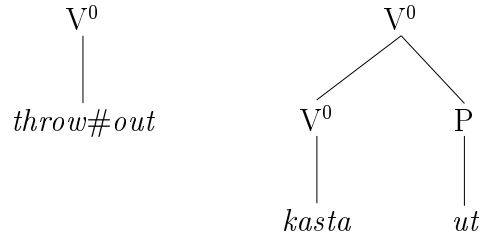
The structure of the CPC appears to be $[_{V'}$ NP prt NP]; that is, a particle intervening between two NPs. This is problematic if we assume that non-projecting words are always head-adjoined: the particle cannot be head-adjoined to V^0 since the first NP intervenes between V^0 and the particle. There is also another reason why assuming attachment at the V′-level is problematic: a comparison of the English and the Swedish facts show that the English particle *cannot* attach to V′, even when there is only one object. This becomes clear if we consider two generalizations arrived at earlier and repeated in (7.47):

(7.47) (i.) The pre-object particle (in both English and Swedish) does not project a phrase.

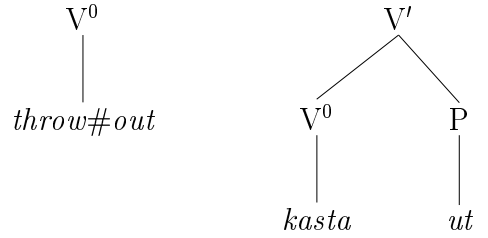
(ii.) There is a tighter connection between the verb and the pre-object particle in English than in Swedish.

We can capture the facts in (7.47) with any one of the pairs given in (7.48):

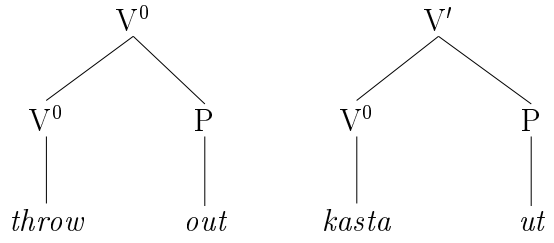
(7.48) (a)



(b)

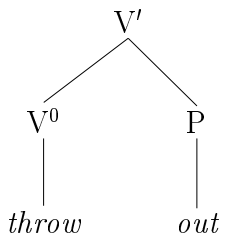


(c)



In chapter 4, I hypothesized that non-projecting morphologically independent words must be head-adjoined, and if that is correct, (7.48b-c) must be wrong. However, even if we set the head-adjunction claim aside for now and assume that all three pairs of structures are possible, the generalizations in (7.47) are left unexplained if we assign the following structure to English:

(7.49)

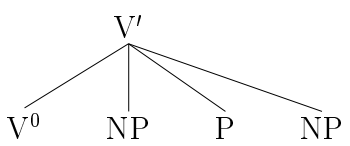


If we assume (7.49) for English, we cannot capture generalization (7.47ii). I therefore take the following generalization to be true:

(7.50) English particles are not attached to V′.

It is now clear that the CPC poses a problem for the generalization in (7.50). Since the particle in this construction must follow the first NP, it cannot be head-adjoined or lexically adjoined to V^0. However, the particle in a CPC cannot be modified (see the examples in (7.44)), which indicates that it does not project a phrase. These two facts taken together suggest the following structure:

(7.51)



We now have a paradox, since what we know about verb-particle combinations has led us to the conclusion in (7.50), stating that English particles (non-projecting words) are *not* attached at the V′-level. Moreover, the theory of chapter 4 predicts that non-projecting words only attach at the X^0-level, so (7.51) should be ruled out independently of the facts in (7.47). Let us therefore take a closer look at the CPC.

7.4.1 Arguments for a constructional analysis of the CPC

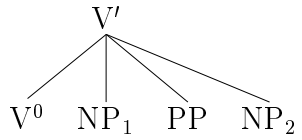
Sag (1987) treats the CPC as a kind of *constructional idiom* (although he does not use that term). As was discussed in section 4.9.2, Sag develops a general theory for particles which is similar in spirit to the present theory. He assumes that particles can be [LEX:−] (equivalent to projected phrases) or [LEX:+] (equivalent to non-projecting words). Sag's theory does not straightforwardly account for sentences like (7.42), so he posits a special lexical entry for *send* with the following SUBCAT list (1987:331): <NP NP PP[PRT] NP>.[12] The ordering of elements is supposed to follow an obliqueness hierarchy, where the object is more oblique than the subject, etc. The kind of lexical entry that Sag posits for 'send' is in effect a kind of idiom.

Many authors have argued that we need to recognize the existence of constructions in the grammar (Fillmore 1988, Kay and Fillmore 1999, Goldberg 1995, Jackendoff 1990b, 1997a, 1999, 2001b). Ackerman and Webelhuth (1998), Webelhuth and Ackerman (2001), Toivonen (2000a,b) discuss possible ways of incorporating constructions into LFG. There is evidence that the CPC is best analyzed as a constructional idiom, where by constructional idiom I mean (7.52):[13]

(7.52) A constructional idiom is a phrase larger than a single word which is governed by idiosyncratic restrictions and is associated with a particular form.

The form of the complex particle construction is given in (7.53):

(7.53)



The ordering of complements is unusual: a PP intervenes between the NP objects. These kinds of idiosyncracies are not uncommon among constructional idioms (Toivonen 2000a,b).

[12] In Sag 1987, the SUBCAT list is actually <NP PP[PRT] NP NP>. The HPSG convention concerning the ordering of SUBCAT elements has subsequently changed, and I am following the new convention.

[13] As will become clear later, the CPC is not a construction in the strict (Construction Grammar) sense of the word. Instead, all the necessary information is tied to the verb.

Some expressions of the form (7.53) are uncontroversially of idiomatic character. An example is *make someone out something*, e.g, *I made the man out a liar.* However, note that even this expression has exchangeable parts. There are only two fixed lexical choices, *make* and *out*, the other words may vary. Other CPC examples are much more flexible than *make NP out NP.*

I will discuss the formalization of the CPC below, after I give evidence for its constructional status. However, let me first sketch what I take to be the nature of this construction, so that it will be clear what kind of entity it is. I assume that the CPC is tied to the verbal head, and that there is a limited group of verbs that can participate in the contruction. Only verbs of transfer *send, give, etc.* can head the CPC. There is also a constraint on the particle: it must denote a direction. For example, completive *up* cannot be used: it is infelicitous to say **I ate John up the cake* with the intended meaning *I ate up the cake for John('s benefit).* There are also constraints on the NPs: NP_1 has to be animate, and NP_2 cannot be a pronoun. These constraints are summarized in (7.54):

(7.54)

V	NP_1	PP	NP_2
transfer	animate	locational	non-pronominal

The information in (7.54) must be stored in connection with the CPC form. (7.54) is just a first approximation.[14]

A constructional idiom analysis predicts there to be idiosyncratic differences between languages as to exactly which constructions exist. This appears to be true, as we can see in the following examples from Icelandic:[15]

(7.55) (a) *Kennarinn setti (*fyrir) nemendunum (fyrir) θetta kvæði (fyrir).*
teacher.the set for students.the for this poem for
'The teacher assigned this poem to the students.'

[14] I do not claim that (7.54) is a complete account of the CPC: future research is likely to discover more subtle characteristics of this construction.

[15] The sentences in (7.55) are from Collins and Thráinsson (1996:435), who thank Jóhannes Gísli Jónsson for providing the examples.

(b) *Ég gaf (*upp) mönnunum (upp) θetta símanúmer (upp).*
I gave up men.the up this phone.number up
'I gave the men this phone number.'

The examples in (7.55) are not directly translatable into English, although both languages allow complex particle constructions. The fact that these constructions often do not translate directly lends support to the hypothesis that they are idiomatic. Compare also Swedish and English. Recall the examples in (5.19), repeated below as (7.56):

(7.56) (a) *sätta* **på** *barnen varma tröjor*
set on.PRT children.the warm sweaters.the
'put warm sweaters on the children'

(b) *kasta* **av** *sig kläderna*
throw off.PRT SIG clothes.the
'throw one's clothes off'

(c) *ta* **ifrån** *eleven pennan*
take from.PRT student.the pen.the
'take the pen from the student'

(d) *säga* **till** *personalen att komma*
say to.Tsc prt staff.the to come
'tell the staff to come'

The expressions in (7.56) are similar to the English complex particle examples in that we have a particle and two objects. However, the translations of (7.56) are not complex particle constructions in English. Note also that complex particle examples in English cannot in general be translated as a particle and a double object in Swedish: compare (7.57) and (7.58):

(7.57) (a) *He sent me up a drink.*

(b) *I handed them out some papers.*

(c) *They gave us out lots of flowers.*

(7.58) (a) **Han skickade* **upp** *mig en drink.*
he sent me up a drink

(b) **Jag delade* **ut** *dem några paper.*
I handed out them many papers

(c) **Dom gav* **ut** *oss många blommor.*
they gave out us many flowers

The examples above show that typical English CPC examples cannot be translated into expressions of the form [prt NP NP] in Swedish. The sentences in (7.57) would instead be translated as (7.59), which are of the form [prt NP PP]:

(7.59) (a) *Han skickade* **upp** *en drink till mig.*
he sent up a drink to me
'He sent up a drink to me.'

(b) *Jag delade* **ut** *några papper till dem.*
I handed out some papers to them
'I handed out some papers to them'

(c) *Dom gav* **ut** *många blommor till oss.*
they gave out many flowers to us
'They gave us out many flowers.'

The facts in (7.56-7.58) show that different restrictions holds over the CPC in Swedish and in English, which lends support to the hypothesis that it is a constructional idiom.

Let us now consider the word order. Recall from (7.43) that the order [V Prt NP NP] is ungrammatical in English (for most speakers). Under the constructional idiom hypothesis, this can be formalized with a simple specification on the verbs that participate in these idioms: the CPC allows morphologically simple verbs (the type in (7.33)), but not morphologically complex ones (the type in (7.34)). Restrictions on what kind of lexical items can participate are expected on a constructional analysis. It is therefore natural to find a constraint against complex verbs in the CPC. [16]

Another peculiar word order characteristic of the CPC is that the particle cannot follow the two NPs, unlike other PPs:

(7.60) **They sent the men drinks down.*

[16] Dialects that allow examples such as (7.43) do not have such a constraint on the CPC.

Since *down* can normally project a phrase, it would be surprising that (7.60) is ungrammatical, if the CPC was not associated with a strict syntactic frame.

A further significant fact is that the construction is not fully productive. If the CPC was completely productive, we would expect (7.61) to be grammatical, but they are not, even though (7.62) are fine:

(7.61) (a) **I sent the men away some flowers.*

(b) **You lent them out some books.*

(7.62) (a) *I sent away some flowers to the men.*

(b) *You lent out some books to them.*

A preliminary search of the British National Corpus (BNC),[17] did not reveal any CPC examples involving *send-away* or *lend-out*. The data in (7.61) shows that even though the parts of many constructional idioms are exchangeable, there are usually semantic restrictions on what combinations are allowed (Goldberg 1995, Jackendoff 1990b, 2001b, Toivonen 2000a). The examples in (7.61-7.62) make it clear that some such restrictions hold over the CPC.[18]

Note finally that on a constructional view, it follows naturally that the particle cannot be modified: it is a common property of idioms that their individual parts cannot be modified. For example, *he kicked the gruesome bucket* cannot mean *he died a gruesome death.*

We have seen above that there many facts support the hypothesis that the CPC is a kind of constructional idiom. Let us now look at how this construction can be formalized within LFG. The lexical entry for the construction must include the following information:

(7.63) $\mathrm{V}' \longrightarrow \mathrm{V}^0{}_{simple}\ \mathrm{NP}\ \mathrm{PP}_{prt}\ \mathrm{NP}$

[17] The BNC is available on-line at *http://info.ox.ac.uk/bnc* and *http://sara.natcorp.ox.ac.uk/lookup.html*

[18] And the examples in (7.61) furthermore make it clear that the preliminary restrictions in (7.54) need to be expanded in order to capture all the details of the data.

The construction can be thought of as being connected to the head: a (simple) verbal head can be connected to a homophonous head by a lexical correspondence rule, and this head is connected to the rule in (7.63). This view of constructions avoids the problems connected to the insertion of elements bigger than words into the syntax.

For a concrete example, let us look at what *make NP out NP* (as in *make Fred out a liar*) would look like:

(7.64) **form:** *make NP1 [$_{PP}$ out] NP2*
meaning: *claim NP1 to be NP2*

The derived lexical entry for *make* will look something like (7.65):[19]

(7.65) $make_{idiom}$: V^0 $(\uparrow \text{PRED}) = \text{`make } (\uparrow \text{SUBJ}_1)(\uparrow \text{OBJ}_2)(\uparrow \text{OBL}_3)$
$(\uparrow \text{OBL FORM}) =_c \text{OUT}$

LCS: [CAUSE ([1],[SEEM ([2],[3])])]

The reason why the preposition (generally) cannot be modified is that it is an idiom chunk without compositional meaning. However, sometimes the particle does seem to provide its meaning compositionally. Interestingly, many speaker then *do* allow the particle to be modified. These speakers find the examples in (7.44), repeated below as (7.66) acceptable:

(7.66) (a) *%I sent the men right out flowers.*
(b) *%They handed John right down the tools.*

The fact that the prepositions in (7.66) *are* modifiable falls naturally out of the analysis given here.

Let us recapitulate here. Several facts indicate that the CPC is a constructional idiom:

[19] I use a simple version of Jackendoff's (1983, 1990b) Conceptual Semantics notation to represent the lexical conceptual structure (LCS). This notation was also used in chapter 6.

- Different languages put different restrictions on the CPC.
- Modification of the particle is restricted.
- The construction is governed by certain restrictions.
- The particle cannot follow both NPs, although PPs normally can.
- The verbal head is restricted to simple verbs.

The structure that I have adopted for the CPC in this section is basically th!t of Sag (1987). However, there *are* speakers that do not accept modification of the particle, as in (7.66). The [NP PP NP] structure does not seem an appropriate way of modelling the CPC for those speakers. I will therefore consider an alternative realization of the CPC in the next section.

7.4.2 An alternative construction

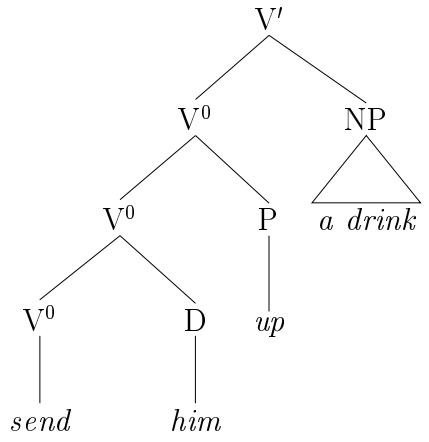
A preliminary corpus search of the two common CPCs *send NP up NP* and *give NP out NP* revealed an interesting fact: the first NP of every example is a pronoun. Two representative examples are given in (7.67):

(7.67) (a) *Then I asked service to send me up some food and a large pot of coffee...* (BNC)

(b) *Give me out a load, yes.* (BNC)

In both examples in (7.67), the first NP is the pronoun *me*, whereas the second NP consists of a full NP. Another interesting fact is that I did not find any examples where the particle was modified, although some of my informants accept modified particles in the CPC. If the first NP must be a pronoun and the particle cannot be modified, there is reason to assume the CPC structure in (7.68):

(7.68)



In (7.68), the pronominal is treated as a non-projecting word (of category D) which is adjoined to V^0, and this explains why pronominals *only* are permitted The particle is also adjoined to V^0. The structure in (7.68) is compatible with the constituency tests of Kiparsky (1989): the verb, the first nominal and the particle form a constituent to the exclusion of the second NP.

So, which structure is correct for the CPC? Given the fact that this construction is associated with great dialectal variation, it seems likely that *both* structures exist. In some dialects, the [V^0 NP PP NP] structure given in (7.53) is associated with the CPC, whereas other dialects associate (7.68) with the CPC. If this hypothesis is correct, and if these are the only two structures that correspond to the CPC across dialects (others are in principle possible), the following generalizations should hold:

(7.69) (A) Speakers who allow non-pronominal NP_1 allow modification of the particle.

(B) Speakers who only allow pronominal NP_1 do not allow modification of the particle.

The analysis proposed here makes the prediction that (7.69) should be correct. I leave this issue open for future research, but I want to note again that many extra-syntactic factors influence grammaticality judgments of examples of this construction (Gries 1999, 2001).

The CPC structures proposed here are not found elsewhere in English (as far as I know), but they are allowed by the X′-theory developed in chapter 4. Structure (7.53) is

unusual in that a PP precedes an NP, and structure (7.68) is unusual in that a particle is head-adjoined, although particles are normally lexically combined with the verb in English (as was discussed in section 7.3.2). Unconventional structures are not expected in constructional idioms.

7.4.3 Summary

This section has discussed the English CPC. I have argued that the CPC is best analyzed as a constructional idiom; that is, a set syntactic structure associated with certain verbs and certain semantic restrictions. One of the arguments for this constructional analysis is that the verb particle construction is not fully productive. For example, (7.70) is unacceptable, even though *lend* is a ditransitive verb:

(7.70) **I sent them away some flowers.*

Note that the unacceptability of (7.70) cannot be explained away by appealing to semantic incompatibility of the verb *lend*, a double object and the particle *out*. If that combination were unacceptable, we would expect *I lent out some books to them* to be out, but it is not. It was also argued in this section that some of the dialectal variation is due to the fact that the CPC corresponds to different c-structure representations in different dialects.

7.5 An overview of Germanic particles

This chapter has discussed the equivalents of the Swedish verbal particles in three other Germanic languages: Danish, German and English. Danish and English do not have non-projecting words, but German and Swedish do. English differs from the other languages in that the verbs can be simple or complex: complex verbs combine a verb and a particle lexically, and the combination is inserted under V^0 as a lexical unit. The similarities and differences between the languages are summarized in (7.71). The first column lists the languages; the second specifies whether or not a language has non-projecting words ('particles'); and the third column concerns the complex verbs. The

fourth and fifth column list differences between the languages that are well-known from previous work on Germanic: all four languages except English are verb second in main clauses, and German is verb-final in subordinate clauses.

(7.71)

	particles	lexical V-P	V2	verb-final
Swedish	yes	no	yes	no
Danish	no	no	yes	no
German	yes	no	yes	yes
English	no	yes	no	no

The characteristics of the verbal particles in the different languages as well as the differences in word order follow from the properties in (7.71).

An interesting generalization emerges: English is the only language where the verb and the particle can combine lexically, and it is also the only language which is not verb-second. It is possible that English particles used to be syntactically independent, head-adjoined words just like the particles in several other Germanic languages. The fact that the English particles were reanalyzed as being lexically combined with the verb might be connected to English word order: since English is not V2, the verb is immediately adjacent to the particle in most cases, while this is not true in V2 languages, where the tensed verb appears in a higher functional projection. It seems natural that reanalysis of two words into one would occur if those two words are adjacent in the lexical string, whereas this kind of reanalysis seems less natural if the two words are often not adjacent in the string.

Finally, the analysis presented here does not appeal to word order parameters in order to account for the ordering with respect to other verbal arguments. The ordering follows from the restrictive X′-theory in chapter 4 in combination with lexical specifications which determine whether or not words project, and whether or not certain elements can combine with verbs lexically.

Chapter 8

Conclusion

This work has mainly been concerned with non-projecting words. The empirical focus has been on Swedish verbal particles, but I have also discussed Danish, German and English particles (or words that are traditionally called particles). In addition, I have treated other 'small' words from a variety of languages, where by 'small' words I mean elements that seem smaller than full phrases, although they are not morphologically bound morphemes. These small words differ from other words and morphemes in their structural realization, although they are the same with respect to semantics and grammatical function. This is straightforwardly captured in the theoretical framework of LFG, which makes an explicit separation between different levels of structure. Since c-structure only models the least abstract aspects of syntax (linear order and constituency), the focus of syntactic research in LFG has until now been mainly on f-structure and a-structure.[1] This work instead focusses on c-structure as the locus of important syntactic constraints and generalizations.

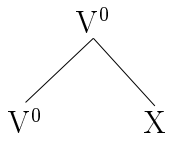
In this chapter I review and discuss the major findings that emerged from this study. I also point to some of the main theoretical implications, and explore possible areas of further research.

[1]There are important exceptions to this generalization; see, e.g., Sadler and Arnold (1994), Sells (2001).

X′-theory

The main proposal of this work is that we need to allow for non-projecting words in constituent structure. Swedish verbal particles provide strong evidence for non-projecting structures, since they cannot take complements and modifiers. I have proposed that they are represented in c-structure as the X node in (8.1):

(8.1)



The structure in (8.1) is syntactic, not morphological, so Lexical Integrity does not hold over the top V^0.

Although particles are easily distinguished from other words and phrases by their structural properties, I show that they do not form a uniform class with respect to syntactic category, grammatical function or semantic function. This is problematic in theories where structure and function necessarily go hand in hand. In the Principles and Parameters approach, for example, predicate-argument relations are thought to be directly encoded in the phrase structure. In LFG, however, c-structure constitutes a separate level of linguistic information, and it has previously been noted that there are mismatches between c-structure and f-structure. For example, Andrews (1990) argues that the subject function in Irish corresponds to an independent NP (8.2) *or* to a pronoun incorporated into the verb, situated in the V^0-node (8.3):

(8.2) (↑ SUBJ)=↓

(↑ PRED) = ‘pro’

(↑ PERS) = 1

(↑ NUM) = SG’

(8.3) $\uparrow{=}\downarrow$

V^0

chuirf-inn

($\uparrow$ PRED) = 'put'

($\uparrow$ SUBJ PRED) = 'pro'

($\uparrow$ SUBJ PERS) = 1

($\uparrow$ SUBJ NUM) = SG

In other words, a given grammatical function may be realized in different ways in c-structure within the same language. Swedish particles illustrate that it is also possible for a single c-structure position to host more than one f-structure function. These kinds of mismatches are expected (and commonly appealed to) within LFG, since different kinds of information are modelled at distinct levels.

It is important to note that the structure in (8.1) involves two separate claims: that particles are non-projecting and that they are head-adjoined. Although those claims are in principle independent, I have proposed that they are in fact connected: the only way for a non-projecting word to be realized is through head-adjunction. Furthermore, *only* non-projecting words can head-adjoin. I have shown that Swedish particles do indeed adjoin to the verbal head, but this does not, of course, entail that *all* non-projecting words are head-adjoined. I leave it to future research to test whether it is empirically correct to connect the absence of phrasal levels to head-adjunction. Regardless of whether the exact proposal laid out here is adopted, the Swedish verbal particles show that we need to allow for non-projecting words in the phrase-structure, and this necessitates a rethinking of X′-theory, since traditional X′-theory states that each word heads (at least) two levels of projection: an intermediate level (X′) and a phrasal level (XP).

Economy of Expression

The notion of Economy proved to play an important role in the analysis of the particles. Some Swedish particles optionally project full phrases, and can thereby host modifiers. However, the particles do not project unless they are modified. The principle

of Economy (repeated in (8.4)) punishes empty projection:

(8.4) *Economy of Expression*
All syntactic phrase structure nodes are optional and are not used unless required by X′-constraints or completeness.

Consider the examples in (8.5):

(8.5) (a) *Erik sparkade* [$_P$ **upp**] *bollen.*
E. kicked up ball.the
'Erik kicked the ball up.'

(b) *Erik sparkade bollen* [$_{PP}$ *rakt upp].*
E. kicked ball.the straight up
'Erik kicked the ball straight up.'

(c) **Erik sparkade bollen* [$_{PP}$ *upp].*
E. kicked ball.the up

Example (8.5a) shows that *upp* does not need to project a phrase; (8.5b) shows that *upp* can project a phrase; and (8.5c) shows that *upp* cannot project a phrase when it is not modified. These facts would be mysterious if we did not assume that extra structure is punished. The Economy principle has previously been motivated mainly on philosophical and theoretical grounds, but the Swedish particles provide actual empirical evidence for such a principle.

Resultative predication

The investigation of the semantics of the verbal particles revealed an interesting fact concerning secondary predication: resultative (pre-object) particles are always predicated of the direct object. Some recently discovered facts show that it is possible for resultatives to be predicated of subjects, contrary to what has previously been believed (Wechsler 1997). However, particles cannot be subject-predicated. This generalization appears to be true in both Swedish and English:

(8.6) (a) *Susan took the bus home.*

(b) *Susan took home the bus.*

In (8.6a), *home* is predicated of either the subject or the object, but in (8.6b), it must be predicated of the object. In Swedish a pre-object particle (such as the Swedish equivalent of *home* in (8.6b)) is also necessarily predicated of the object. However, the verbal particles differ in other ways in the two languages; in fact, English does not have particles at all, if particles are by definition syntactically head-adjoined words. I have argued that the pre-object 'particles' in English are actually attached to the verb lexically, rather than syntactically. Interestingly, this lexically bound element often denotes a result,[2] and this result is then necessarily object-predicated. I conclude that predicates that are closely tied to a (transitive) verbal head are necessarily object-predicated in Swedish and English. I leave open the question of whether this is cross-linguistically true.

The structure-function mapping

There are cross-linguistic generalizations concerning the c-structural realization of grammatical functions: a given function is generally associated with a certain phrase structure position. This observation is reflected in the c- to f-structure mapping principles, which constrain the c-structure positions of specific functions (*if* those functions are c-structurally defined in a given language). The principles were posited because they seem empirically motivated, and they make strong typological predications.

Let us consider a concrete example. Mapping prinicple (e) in (4.28) (section 4.4, repeated below) rules out the possibility of a word with the ADJUNCT function head-adjoining to a lexical category:

(e) Words adjoined to lexical heads are co-heads or argument functions.

It then follows that non-projecting adjuncts must adjoin to *functional* heads, since they must head-adjoin and they cannot adjoin to lexical heads. This prediction is clearly empirically testable, and future research will determine whether it is true, alongside the other predictions that arise out of the mapping principles.

The intuition that given grammatical functions are associated with certain c-structure

[2]The bound element can also be aspectual or part of an idiom.

positions is of course not original to this work: linguists have tried to capture this intuition for a long time.[3] It is difficult to find clear empirical support for strong claims about universal one-to-one mappings (see, e.g., Kayne 1994 for a proposal). The present theory offers a compromise, since structurally defined functions can here be realized only within a certain structural space. For example, OBJECTS can only surface as complements of lexical categories or as head-adjoined words. This restricts their distribution without tying them to one single position universally, although objects might of course be connected to a single position in a given language.

Clitics

A large amount of data relevant to the investigation of the nature of non-projecting words can be found in the literature on *clitics*. Elements of very different character have been grouped together by linguists under the term 'clitic'. I have introduced a new classification, where words are divided along two parameters: syntactic projectivity and phonological dependence. The new typology that emerges divides words elements into four clearly definable groups, and only projecting, phonologically independent words have nothing in common with words that have been referred to as 'clitics' or 'clitic-like' in the literature. On the other hand, only non-projecting, phonologically dependent words are true clitics:

(8.7)

	phonologically dependent	phonologically independent
non-projecting	**true clitics**	
projecting		**true non-clitics**

Previous studies of clitics and clitic-like words have led researchers to view different types of words as points on a gradient scale, beginning with proto-typical clitics (or perhaps bound words), and going all the way to independent words that project phrases. The new classification proposed here instead divides words into discrete categories. We see then that by recognizing the existence of non-projecting words, we have not only

[3]See most work within the Principles and Parameters framework. See also Bresnan (2001). The principles adopted here are based on Bresnan's principles, except the claim made here is stronger, as Bresnan allows each principle to be overridden by language-specific rules.

gained insight into the nature of verbal particles, we have also acquired the tools needed for a clearer classification of different types of words.

This new classification is useful for the study of the type of historical change which is called *grammaticalization* (Meillet 1912, Kuryłowicz 1964, Hopper and Traugott 1993). Grammaticalization refers to a historical change where a linguistic element which is relatively syntactically independent is reanalyzed as an element which is less independent. The term also refers to the change of lexical words into function words, and the two types of change often go hand in hand. An example of grammaticalization would be a syntactically independent pronoun changing into an agreement marker.[4]

A problematic aspect of the grammaticalization literature is a lack of clear criteria for what counts as more or less grammaticalized, and a big part of the problem is the notion of *gradience*: a full phrase will not be reanalyzed as a bound morpheme in one step. Instead, elements are thought to go through many different stages on the path to full grammaticalization. If we recognize that words can be at the same time syntactically independent and non-projecting (regardless of their phonological status), it becomes possible to describe (at least some of) the different stages of grammaticalization in a more precise way. These descriptive tools can then help us state clearly what counts as more or less grammaticalized.

As an example, let us consider Swedish particles which are of the category noun, and we will see that these particles are relevant to the notion of grammaticalization (recall that nominal particles are exemplified by verb-particle expressions such as *bygga hus* 'build house' and *hålla tal* 'make speech'). It was already noted above that there are similarities between incorporated nouns and nominal particles. On the other hand, nominal particles are very much like full NP objects. It then seems natural to hypothesize that non-projecting, syntactically independent nouns (such as the Swedish nominal particles) can constitute one step in the chain of reanalyses that lead to the possibility of incorporating a nominal element into a verbal stem. The first step would be a full phrasal object, the second step would be a nominal particle, and the final step is complete incorporation.

[4]Using the term grammaticalization does not necessarily entail granting it any special theoretical status: grammaticalization can simply be seen as a descriptive term covering several phenomena (Harris and Campbell 1995).

In sum, drawing upon the traditional intuition that 'small words' do exist, I have shown that the Swedish verbal particles are such words. I have proposed that these elements can be thought of as non-projecting words, and I have also explored how the occurrence of such elements is constrained. In addition, I have suggested that an explicit statement of the formal status of 'small' words' is useful for the exploration of the typology of words and phrases.

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