On Partial Constituent Fronting in German*

KORDULA DE KUTHY and WALT DETMAR MEURERS
Department of Linguistics, The Ohio State University, 222 Oxley Hall, 1712 Neil Avenue, Columbus, OH 43210-1298, USA

Abstract. This paper presents a reevaluation of the choice between the two analyses for German partial fronting phenomena proposed in the literature, remnant movement and reanalysis. We show that the empirical arguments which were presented in favor of an extraction analysis are not convincing, and we provide empirical evidence supporting a reanalysis-like approach. Turning to a detailed data discussion, we compare three different kinds of partial constituents: verbal, adjectival, and nominal ones. Adjectival complements pattern with coherently selected verbal complements whereas nominal complements turn out to be less restricted. On the theoretical side, we show that a reanalysis-like theory can be given a formally precise rendering in the HPSG architecture in terms of a lexical argument-raising specification, which is already widely employed in HPSG analyses of coherence in Germanic and restructuring verbs in Romance languages. The account we propose generalizes previous HPSG approaches to partial complements of different categories and correctly predicts the interaction of (partial) VP topicalization with embedded partial NPs or APs.

Key words: German syntax, partial constituents, topicalization, coherent construction, reanalysis, remnant movement, argument raising, HPSG, lexical generalizations

1. Introduction

The topicalization of partial constituents in German has received much attention in the literature since the phenomenon is a serious challenge to a theory of constituency. In the paradigm of Head-Driven Phrase Structure Grammar (HPSG, Pollard and Sag, 1994), the attention has focused on the topicalization of partial verb phrases. But G. Müller (1993, 1996) and others noted that partial constituent fronting in German also occurs with nominal and adjectival phrases. A simple example for each of the categories is shown in (1).

(1) a. [Verkaufen] wird er *das Pferd*.
sell will he the horse
He will sell the horse.

* We would like to thank Stefan Müller for many stimulating discussions, Gosse Bouma, Erhard Hinrichs, Christian Fortmann, Danièle Godard, Tilman Höhle, Tibor Kiss, Jürgen Pafel, Ivan Sag, Craig Thiersch, Gert Webelhuth, and the anonymous reviewers for interesting comments and discussions, and the participants of the Berkeley Germanic Linguistics Roundtable 98, FHCG 98, KONVENS 98, HPSG 99, and the Bad Teinach workshop on "Linguistic Form and its Computation" in 1999, where different parts of our proposal were presented.

To appear in: *Journal of Comparative Germanic Linguistics*, 2001

b. [Ein Buch] hat Hans *über Syntax* ausgeliehen.
a book has Hans on syntax borrowed
Hans borrowed a book on syntax.

c. [Stolz] ist er *auf seine Kinder* gewesen.
proud is he of his children been
He was proud of his children.

In (1a), the transitive verb *verkaufen* has been fronted, leaving its complement, the NP *das Pferd*, behind. In (1b), the NP *ein Buch* is topicalized without its PP complement *über Syntax*. And in (1c), the AP *stolz* has been fronted, leaving its PP argument *auf seine Kinder* behind.

As for the theoretical consequences drawn from such data, two ideas pursued in the paradigm of Government and Binding (GB, Chomsky 1981, 1986) are that (i) the constructions involve movement of a constituent containing a trace, so-called *remnant movement* (Thiersch, 1985, Webelhuth and den Besten, 1987, G. Müller, 1996) or that (ii) 'small' constituents can be topicalized which are licensed with the help of special processes like *reanalysis* (Fanselow, 1987, for partial NPs). Parallel to these two ideas, HPSG approaches to partial VP topicalization have proposed a remnant-movement-like analysis (Hinrichs and Nakazawa, 1994b) or employed *argument raising*, a lexicalized variant of functional composition which supports partial structures like those resulting from reanalysis (Pollard, 1996; Nerbonne, 1994; Kathol, 1995, sec. 7.7; Meurers, 1999a; S. Müller, 1997; Bouma and van Noord, 1998, sec. 3.4). One of the arguments against reanalysis fielded by G. Müller (1991, p. 175) is that a reanalysis rule cannot properly be expressed in the GB framework. Therefore, an interesting aspect of the parallel development in the two frameworks is that the argument-raising approaches in HPSG give a formally precise rendering to a notion of reanalysis. We will use the term *reanalysis-like* to refer to any analysis licensing partial constituents as 'small' constituents.[1]

Given this state of affairs, the purpose of this paper, which integrates and extends our work presented in De Kuthy and Meurers (1998a, 1998b, 1999b), is twofold: Firstly, we reevaluate the empirical basis of the choice between the two analysis ideas proposed in the literature, remnant movement and reanalysis. More specifically, we show that the empirical arguments that are presented by G. Müller (1996) in favor of an extraction analysis are not convincing, and we provide empirical evidence supporting a reanalysis-like approach. The second purpose of this paper is to provide an explicit theory licensing reanalysis-like

[1] Approaches such as Sternefeld (1991) and Müller and Sternefeld (1995) have implemented a different notion of reanalysis in terms of movement.

structures for partial constituents of three different categories. In order to extend the empirical coverage of previous reanalysis-like theories in such a way, we first discuss and compare the partial constituents of the three different categories illustrated in (1) in order to highlight the similarities and the differences in the three sets of data. Finally, we present a proposal licensing reanalysis-like structures in an HPSG architecture.

2. Remnant Movement vs. Reanalysis: An Empirical Reevaluation

It is traditionally assumed that verb-second clauses in German are derived from verb-first structures by extracting an element and fronting it. A second assumption which is made in the principles and parameters paradigm is that the fronted element has to be a maximal projection, an assumption which follows from Chomsky's 1986 restrictions on movement and X-bar theory (Jackendoff, 1977): movement is restricted to XPs and X^0-categories, every non-head is an XP, and the landing site of fronted elements is a non-head position.

Under these assumptions, the partial fronting phenomenon in German we saw exemplified in (1) is a serious problem. One of the solutions to this problem is the *remnant-movement* approach, which assumes that the apparently partial, fronted constituents are actually full XPs containing a trace of the argument left behind in the *Mittelfeld*[2], so-called *remnant categories*.[3]

The second solution already mentioned in the introduction is what we refer to as the *reanalysis approach*. Under this approach, a fronted constituent which appears to be partial with respect to the constituents ordinarily assumed for the *Mittelfeld* is in fact a 'small' constituent. As discussed below, such small constituents have either been assumed to be base-generated in addition to the full constituents (Horn, 1975, sec. 2.3; Bach and Horn, 1976; Chomsky, 1977), or they can be derived via a reanalysis rule as proposed by Fanselow (1987).

[2] The *Mittelfeld* is the topological field in between the complementizer in verb-last or the finite verb in verb-first/second sentences and the right-sentence bracket containing the non-finite verbal elements or particles. For a discussion of the topological fields traditionally assumed for German sentences, the reader is referred to Reis (1980), Höhle (1986), and Kathol (1995, ch. 2).

[3] A remnant-movement approach faces certain theoretical problems concerning the question of how a trace can be bound by a filler occurring configurationally lower in the tree. A discussion of this and other formal issues can be found in G. Müller (1996) and Stabler (1999). We here focus on the empirical arguments, leaving the technical aspects of remnant movement aside.

In the following, we focus on the empirical arguments which G. Müller (1996) provided to justify the existence of remnant categories. We start our empirical reevaluation with nominal complements, a domain on which much of the remnant-movement vs. reanalysis debate has focused.

2.1. *Nominal complements*

Example (2) shows a sentence in which the PP argument of a noun has been topicalized.

(2) *Über Syntax* hat Hans sich [ein Buch] ausgeliehen.
on syntax has Hans himself a book borrowed
Hans borrowed a book on syntax.

Webelhuth (1992), G. Müller (1996), and others argued that in such sentences the PP has been extracted from the NP. But as pointed out by Fanselow (1987), sentences like (3) are problematic for this assumption since the extraction source *ein Buch* and not the extracted element *über Syntax* has been fronted.

(3) [Ein Buch] hat Hans sich *über Syntax* ausgeliehen.
a book has Hans himself on syntax borrowed

For such examples, G. Müller (1996) proposes a remnant-movement account in which the fronted NP contains a trace of the PP argument.

An alternative analysis was proposed by Horn (1975, sec. 2.3) for similar data in English. Horn observes that examples as in (4), where the fronted *wh*-word belongs to the *about*-PP supposedly embedded in an NP, show some unexpected properties.

(4) Who did John write a book about?

Firstly, not only the object of the preposition can be fronted as in (4) but also the entire prepositional phrase. This is shown in (5).

(5) About whom did Bill write a book?

Secondly, in passive sentences the NP of examples as in (4) can appear as the subject at the beginning of the sentence independently of the PP object, as shown in (6)

(6) [A book] was written [about Nixon] by John.

And thirdly, it is possible to replace the determiner and the head noun supposedly embedding the PP by a pronoun, as the sentence in (7) shows.

(7) John wrote [it] [about Nixon].

Horn concludes that sentences like (4) should be assigned a deep structure as shown in (8), where the NP and the PP do not form one constituent, whereas sentences which do not have the above properties have a deep structure where the PP is part of the object NP.

(8) Bill [$_{\text{VP}}$ wrote [$_{\text{NP}}$ a book] [$_{\text{PP}}$ about Nixon]].

Similar to this idea, Fanselow (1987) proposed for German to employ the rule shown in Figure 1 to 'reanalyze' the complex NP into a simple

$$(_{\text{VP}}(_{\text{NP}} \text{ det N PP}) \text{ V}) \rightarrow (_{\text{VP}}(_{\text{NP}} \text{ det N}) \text{ PP V})$$

Figure 1. The Reanalysis Rule proposed by Fanselow (1987)

NP and a PP which are sisters in the VP. Using such a reanalysis rule, the examples in (2) and (3) can simply be accounted for by extracting the NP or the PP complement from the VP.

When in this paper we speak of a reanalysis approach to partial NPs, we refer to the fundamental property of the approaches by Horn (1975) and Fanselow (1987) that the partial NP and the PP are analyzed as sister constituents rather than embedding the PP in the NP. For the topicalization of partial constituents we are concerned with, the difference between reanalysis and remnant-movement is directly reflected by a difference between the constituents which are fronted. For the reanalysis approach, a partially fronted constituent is only what is visible, a partial constituent in terms of the structure before reanalysis. Under the remnant-movement approach, on the other hand, what looks like a partially fronted constituent is in fact a full XP containing a trace.

2.1.1. *Aspects of a remnant-movement analysis*

G. Müller (1996, pp. 10ff) argues for a remnant-movement analysis by showing that the NP remaining in the *Mittelfeld* in (2) and the fronted NP in (3) obey the following restrictions to be expected from a constituent containing a trace.

2.1.1.1. *Subject-object asymmetries* Firstly, he claims that fronting a PP argument of a subject NP and the reverse case of fronting an incomplete subject NP result in ungrammaticality, as is shown in (9). Under the common assumption that subjects in German may not contain a gap, this behavior would be predicted under a remnant-movement account.

(9) a. * *Worüber* hat [ein Buch] Karl beeindruckt?
about what has a book$_{\text{NOM}}$ Karl$_{\text{ACC}}$ impressed
A book about what impressed Karl?

b. * [Ein Buch] hat Karl *über Syntax* beeindruckt.
a book has Karl on syntax impressed

However, in discussing the issue of the base position of the subject in German, Haider (1993, p. 173) provides the example (10a) which shows that extraction out of subjects cannot generally be ruled out.[4]

(10) a. *Über Strauß* hat [ein Witz] die Runde gemacht.
about Strauß has a joke the round made
A joke about Strauß went round.

b. [Ein Witz] hat *über Strauß* die Runde gemacht.
a joke has about Strauß the round made

Fronting the partial subject NP of Haider's example is also grammatical, as shown by our example (10b) above. The parallel behavior of the two examples in (9) and those in (10) is expected under both approaches. Either the NPs contain a gap, or they result from reanalyzing the NP into a small NP and a PP which can then independently be extracted.

Haider's observation means that the assumption on which G. Müller builds his argument for a remnant-movement analysis of (9b) is incorrect. In light of the grammaticality of the examples in (10), both the remnant-movement and the reanalysis approach lack an explanation of why the sentences in (9) are ungrammatical. The issue discussed in this section thus does not motivate a preference for one or the other analysis.

2.1.1.2. *Specificity effect* Secondly, G. Müller (1996, p. 12) uses examples like (11) to show that both fronting out of an NP and the reverse case exhibit the so-called specificity effect, a classical restriction on extraction (see, e.g., Chomsky, 1973, fn. 19; Fiengo and Higginbotham, 1981, pp. 402ff; Chomsky, 1981, p. 235; Mahajan, 1992; Webelhuth, 1992, p. 170).

(11) a. * *Über Syntax* hat Karl [**das** Buch] gelesen.
on syntax has Karl the book read
Karl read the book on syntax.

b. ?? [**Das** Buch] hat Karl *über Syntax* gelesen.
the book has Karl on syntax read

Similar to the issue discussed in the previous section, an observation made independent of the remnant-movement vs. reanalysis debate sheds some doubt on this conclusion. Pafel (1993, p. 218) observes that

[4] See also Fanselow (1991, p. 190), Pafel (1993, p. 220), and Fortmann (1996).

the specificity of an NP in German does not in general disallow fronting of its argument PP (12a). Transforming Pafel's example (12a) so that the partial NP is fronted as in (12b) also results in a grammatical example.

(12) a. *Von Handke* hat sie nur **diese**, aber nicht **jene** Bücher
by Handke has she only these but not those books
gelesen.
read
She only read these but not those books by Handke.

b. [Nur diese Bücher] hat sie *von Handke* gelesen.
only these books has she by Handke read
She only read these books by Handke.

Parallel to the last section, we thus conclude that in light of the grammatical examples in (12), the ungrammaticality of the examples in (11) cannot simply be reduced to a general restriction on movement. Both the remnant-movement and the reanalysis approach thus are equivalent in that they lack an explanation for the contrast.

2.1.1.3. *Specified subjects* Thirdly, G. Müller (1996, p. 12) claims that fronting the PP and the reverse case of fronting the NP is impossible if a pre-nominal possessor is present as shown in (13).

(13) a. * *Worüber* hat Antje [Karls Buch] gelesen?
about what has Antje Karl's book read

b. * [Karls Buch] hat Antje *über die Liebe* gelesen.
Karl's book has Antje about the love read

G. Müller refers to the Specified Subject Condition formulated by Chomsky (1973, p. 244) to explain the ungrammaticality of the examples in (13). This condition, which prohibits *wh*-movement across a specified subject, was introduced by Chomsky to rule out examples as in (14).

(14) * Who did you see John's picture of?

The example (14) under this explanation is ungrammatical because the fronted *wh*-word has been extracted out of an NP containing a specified subject, the prenominal genitive *John's*.

The same explanation could be given for the two examples in (13) under a remnant-movement approach to partial constituents: the NP *Karls Buch* contains a specified subject, and thus the PP cannot be extracted.

But again an observation of Pafel (1993, p. 219) sheds doubt on this explanation. Pafel observes that the presence of a prenominal genitive

in an NP does not prohibit fronting of the PP in general, as shown by the grammatical sentence (15a). The reverse case in (15b), where the NP containing the prenominal genitive has been fronted, is also grammatical.

(15) a. *Über Bismarck* habe ich [Galls Buch] gelesen.
on Bismarck have I Gall's book read
I read Gall's book on Bismarck.

b. [Galls Buch] habe ich *über Bismarck* gelesen.
Gall's book have I on Bismarck read
I read Gall's book on Bismarck.

Pustejovsky (1985, p. 48) and Kuno (1987, p. 13) discuss that even in English not all prenominal genitives disallow fronting of the PP, which is illustrated by their examples in (16).

(16) a. Which theorem did you read Kripke's proof of?
b. This is the story I haven't been able to get Mary's version of.

Pustejovsky and Kuno analyze such sentences as involving extraction from NP and conclude that the ungrammaticality of Chomsky's example (14) cannot be explained as the result of a general restriction on extraction. With respect to our topic, both the remnant-movement and the reanalysis approach are thus equivalent in that they lack an explanation for the ungrammaticality of the German examples in (13).

2.1.1.4. *Freezing effect* Finally, G. Müller (1996, p. 23) refers to the so-called freezing effect (Ross, 1967, p. 173; Wexler and Culicover, 1980, p. 119) as a restriction on extraction: "extraction of one XP α from another XP β is possible only if β [...] has not undergone movement itself". G. Müller argues that this constraint is responsible for ruling out sentence (17), under the assumption that the PP *worüber* has been extracted from the NP *ein Buch*, which has been scrambled to the beginning of the *Mittelfeld*.

(17) * *Worüber* hat [ein Buch] keiner gelesen?
about what has a book nobody read
On what topic has nobody read a book?

Fanselow (1991, p. 187ff) shows, however, that the empirical basis of this argumentation is not convincing. He provides the example (18), which is grammatical even though it also contains the configuration supposedly causing the ungrammaticality of example (17).

(18) *Worüber* kann [einen Südkurier-Artikel] selbst Peter nicht
about what can a *Südkurier* article even Peter not
am Strand verfassen?
at the beach write
For which topic is it the case that even Peter cannot write an article about it for the Südkurier while being at the beach.

Instead, Fanselow (1991, p. 189) correlates an ungrammatical sentence like (17) with example (19), which is ungrammatical despite the fact that the PP in this example could be a dependent of the verb *schreiben*, so that the freezing effect does not apply.

(19) * *Worüber* kann [einen Südkurier-Artikel] jeder Schwachkopf
about what can a *Südkurier* article every idiot
am Strand schreiben?
at the beach write
For which topic is it the case that every idiot can write an article about it for the Südkurier while being at the beach.

Fanselow concludes that whatever is responsible for ruling out (19) would also cause the ungrammaticality of examples such as (17), i.e., the ungrammaticality of (17) is not a consequence of a restriction on the extraction of PPs from NPs. The example discussed by G. Müller thus has no bearing on the question whether the fronted PP is extracted from the NP or whether the PP is reanalyzed as a sister of the NP and then topicalized.

Summing up, neither the supposed subject-object asymmetries, the specificity, the specified subject, nor the freezing effect data provided as evidence by G. Müller (1996) provide convincing evidence for the remnant-movement assumption that argument PPs are extracted out of NP. In the next section, we turn to the empirical predictions of the alternative hypothesis, the assumption that the complex NP is reanalyzed as two sister categories, a partial NP and a PP.

2.1.2. *Aspects of a reanalysis-like approach*
A reanalysis-like theory for the partial-NP phenomenon predicts that the partial NP and the PP can appear separate from each other as other sister constituents do. Regarding the word order possibilities in the *Mittelfeld*, example (20) illustrates that this prediction is correct. Both the partial NP and the PP can appear independently at the beginning of the *Mittelfeld*, and in (21) other material appears in between the two constituents.

(20) a. Hans hat *über Syntax* während seines Studiums [nur
Hans has on syntax during his studies only
drei Bücher] ausgeliehen.
three books borrowed
During his studies, Hans borrowed only three books on syntax.

b. Hans hat [nur drei Bücher] während seines Studiums
Hans has only three books during his studies
über Syntax ausgeliehen.
on syntax borrowed

(21) a. Hans hat schließlich [drei Bücher] bei Osiander *über*
Hans has finally three books at Osiander on
Syntax gekauft.
syntax bought
Hans finally bought three books on syntax at Osiander.

b. Hans hat schließlich *über Syntax* bei Osiander [drei
Hans has finally on syntax at Osiander three
Bücher] gekauft.
books bought

Further support comes from an observation reported by Grewendorf (1989, p. 46). He notes that independent of the PP, the NP can be included in the verbal complex in the so-called *Oberfeld* phenomenon (cf., Bech, 1955), in which certain verbs can precede their verbal complement rather than follow it:

(22) Niemand hätte gedacht,
nobody would have thought

a. daß Hans *über Becker* würde [einen Sieg] erringen
that Hans against Becker would a victory win
können.
be able to
Nobody would have thought that Hans could win against Becker.

b. daß er über Syntax würde [ein Buch] ausleihen müssen.
that he on syntax would a book borrow have to
Nobody would have thought that he would borrow a book on syntax.

Under a reanalysis approach one would also expect that the reverse case, where the PP argument instead of the partial NP is included in the *Oberfeld*, should be grammatical. But the examples in (23) appear to be of questionable grammaticality.

(23) Niemand hätte gedacht,
nobody would have thought

a. ? daß Hans [einen Sieg] würde *über Becker* erringen
that Hans a victory win would against Becker
können.
be able to

b. ? daß er [ein Buch] würde über Syntax ausleihen müssen.
that he a book would on syntax borrow have to

However, Tilman Höhle (p.c.) points out that there appear to be more acceptable instances of such a construction, such as example (24).[5]

(24) Wenn ich derart informative Arbeiten hätte über
if I such informative works would-have on
Semantik finden können, hätte ich dir die auch
semantics find be-able-to would-have I you these also
noch mitgebracht.
still bring-with
Had I been able to find such informative works on semantics, I would have brought you those as well.

We therefore conclude that the prediction of the reanalysis approach that the PP and the partial NP behave like independent sister constituents appears to be on the right track.

2.2. *Verbal complements*

2.2.1. *Aspects of a remnant-movement analysis*

It was established by Bech (1955) that for a certain class of verbs requiring an infinitival complement, the arguments of the head of an infinitival complement can be permuted with other elements in the *Mittelfeld*. The so-called *coherently* constructing verbs allow this permutation; the *incoherently* constructing ones do not.[6] In (25a), the

[5] In the discussion of partial NPs embedded in fronted VPs in section 3.4, a different construction in which a partial NP actually does not behave parallel to its PP is discussed. As we will see, the ungrammaticality of that construction can, however, be independently explained.

[6] A review of Bech's proposal from a principles and parameters perspective is provided in von Stechow (1984); a discussion in the context of HPSG can be found in Kiss (1995) and Meurers (1999b). In the following, we sometimes make use of one of Bech's notations to mark a verbal head and its dependents: a verb V′ selects a verb V″, and A″ and D″ are the accusative and dative object of the verb V″.

optionally coherent verb *versucht* selects the verbal complement *zu verkaufen*, and the accusative object *das Pferd* is separated from its head *zu verkaufen* by the subject of *versucht*, namely *keiner*. Example (25b) shows that such a permutation of arguments is ungrammatical for the obligatorily incoherent verb *ablehnen*.

(25) a. daß *das Pferd* keiner [zu verkaufen] versucht hat.
that the horse$_{A''}$ nobody$_{N'}$ to sell$_{V''}$ tried$_{V'}$ has
that nobody tried to sell the horse.

b. * daß *das Pferd* keiner [zu verkaufen] abgelehnt
that the horse$_{A''}$ nobody$_{N'}$ to sell$_{V''}$ disapproved$_{V'}$
hat.
has
that nobody disapproved of selling the horse.

Following an idea of Thiersch (1985), G. Müller (1996, p. 18) argues that this contrast can be derived if one assumes that coherently constructing verbs like *versuchen* allow scrambling out of their verbal complement while obligatorily incoherent verbs like *ablehnen* do not. It is assumed that scrambling is an instance of movement so that the constituent *zu verkaufen* in (25a) is a remnant category containing a trace of the scrambled NP *das Pferd*.

A similar contrast arises with partial VP topicalization: Obligatorily coherent verbs like *werden* in (1a), repeated here as (26a), and optionally coherent verbs like *versuchen* in (26b) allow partial VP topicalization while obligatorily incoherent ones like *empfehlen* in (26c) do not.

(26) a. [Verkaufen] wird er *das Pferd*.
sell will he the horse
He will sell the horse.

b. [Zu verkaufen] versuchte er *das Pferd*.
to sell tried he the horse
He tried to sell the horse.

c. * [Zu verkaufen] empfahl er ihr *das Pferd*.
to sell advise he her the horse
He advised her to sell the horse.

Under the remnant-movement idea sketched above, the explanation for these data is straightforward: A coherently constructing verb like *versuchen* in (26a) allows scrambling out of its verbal complement, and the resulting remnant VP can then be topicalized. The verbal complement of an incoherently constructing verb like *empfehlen* in (26c) is not transparent for scrambling, and thus the occurrence of a remnant VP is ungrammatical.

While the remnant-movement analysis makes the correct predictions for the data presented above, certain word order phenomena involving coherent and incoherent infinitives are problematic for such an explanation. We mentioned at the beginning of this section that under the remnant-movement approach, the fronted element is always analyzed as a complete XP category. These categories can undergo topicalization (27), and they can also be scrambled to the beginning of the *Mittelfeld* (28).

(27) a. [Das Pferd zu verkaufen] wird er noch heute versuchen.
the horse to sell will he still today try
He will try to sell the horse today.

b. [Das Pferd zu verkaufen] wird er ihr noch heute
the horse to sell will he her still today
empfehlen.
advise
He will advise her to sell the horse today.

(28) a. Er wird [das Pferd zu verkaufen] noch heute versuchen.
he will the horse to sell still today try

b. Er wird [das Pferd zu verkaufen] ihr noch heute empfehlen.
he will the horse to sell her still today advise

It therefore comes as a surprise that scrambling of complete infinitival complements of obligatorily coherent verbs is not possible (29a) even though the infinitival complements of such heads can be topicalized (29b).

(29) a. * Er wird [das Pferd verkaufen] noch heute wollen.
he will the horse sell still today want to
He will want to sell the horse today.

b. [Das Pferd verkaufen] wird er noch heute wollen.
the horse sell will he still today want to

A second problem for the remnant-movement explanation arises from the assumptions that a coherent infinitive is transparent for scrambling and that partial VP fronting is the result of topicalizing a remnant category emptied in this way. Why is it then that another instance of movement, namely scrambling of this remnant infinitival complement, is ungrammatical? As shown in (30), a partial verbal constituent can

never occur at the beginning of the *Mittelfeld*, yet we are not aware of an independently motivated difference between topicalization and scrambling which would predict this.

(30) a. * Er wird [verkaufen] *das Pferd* noch heute.
he will sell the horse still today

b. * Er versuchte [zu verkaufen] *das Pferd* noch heute.
he tried to sell the horse still today

c. * Er empfahl [zu verkaufen] ihr *das Pferd* noch heute.
he advised to sell her the horse still today

Finally, Haider (1993, pp. 281f) notes a related empirical problem of remnant movement. Since partial VPs are analyzed as complete VPs emptied by scrambling, it is predicted that elements which cannot undergo scrambling obligatorily have to surface as part of the fronted VP. The fact that German *wh*-indefinites cannot undergo scrambling in the *Mittelfeld* (31b) but do not have to be included in the fronted VP (31c) contradicts this claim.

(31) a. daß hier selten wem was auf Anhieb gelungen
that here rarely someone something at once succeed
ist
is

that it was rarely the case here that someone succeeded with something right away

b. * daß hier selten was wem auf Anhieb gelungen
that here rarely something someone at once succeed
ist
is

c. [Gelungen] ist hier selten wem was auf Anhieb.
succeed is here rarely someone something at once

2.2.2. *Aspects of a reanalysis-like approach*
Reanalysis-like approaches such as the argument-raising proposal developed in section 4 can account for the above data. The distinction between coherent and incoherent verbs is captured by specifying coherent verbs as obligatorily raising all complements of their verbal argument so that they become the arguments of a head cluster whereas the complement of an incoherently selecting verb is required to be a complete VP. As a result, in the case of a coherent verb there is no full VP that could be scrambled to obtain examples like (29a). In a sentence with an incoherently selected infinitive such a VP exists, and

it can thus occur at different positions in the *Mittelfeld* (28). Finally, the requirement that coherently selected verbal complements combine in a verbal cluster does not extend to non-local dependencies, which makes it possible to license (29b) but exclude (29a), (30a), and (30b).

Summing up the empirical reevaluation of the remnant-movement vs. reanalysis issue, we showed in section 2.1 that the attractive idea behind the remnant-movement account to reduce certain patterns of ungrammaticality to general restrictions on movement as it stands does not go through. For the partial-NP domain, the counterexamples to each of the supposed general constraints on movement discussed in section 2.1.1 call into question whether these constraints constitute a sound basis for deducing the properties of partial constituents. And the word order data in section 2.1.2 provided empirical support for a reanalysis-like approach. For partial VPs, section 2.2.1 showed that remnant movement does not account for a number of properties which in section 2.2.2 we claim to have a natural explanation under a reanalysis-like approach. Before we substantiate this claim by defining and discussing such a reanalysis-like theory in sections 4 and 5, we first turn to a general overview of the properties of partial constituents of different categories which constitute the empirical desideratum any theory will have to cover.

3. Three Categories of Partial Constituents: A Comparison

3.1. *Verbal complements*

We start the comparison of the three categories of partial constituents with a recapitulation of the properties of verbal complements, many of which were introduced in the theoretically oriented section 2.2.

3.1.1. *Topicalized partial VPs*
The possibility of partial VP topicalization depends on the class of the governing verb. Obligatorily coherent verbs like *brauchen* and optionally coherent verbs like *versuchen* in (32) allow partial VP topicalization while obligatorily incoherent ones like *verzichten* do not.

(32) [Zu verkaufen] braucht / versucht / * verzichtet er *das Pferd*
to sell needs tries forego he the horse
nicht.
not

He does not need to sell / try to sell / forego selling the horse.

3.1.2. *Topicalized complete VPs*
Complete verbal complements can be topicalized independent of the embedding verb. The topicalization of the complete VP in (33) thus is grammatical for all three kinds of verbs selecting infinitival complements.

(33) a. [Das Pferd verkaufen] wird er noch heute wollen.
the horse sell will he still today want to
He will want to sell the horse today.

b. [Das Pferd zu verkaufen] wird er noch heute versuchen.
the horse to sell will he still today try
He will try to sell the horse today.

c. [Das Pferd zu verkaufen] wird er ihr noch heute
the horse to sell will he her still today
empfehlen.
advise
He will advise her to sell the horse today.

3.1.3. *Scrambled complete VPs*
Complete verbal complements can occur at the beginning of the *Mittelfeld* but only when embedded under an incoherent verb as shown in example (34). The VP *das Pferd verkaufen* cannot occur at the beginning of the *Mittelfeld* when embedded under the obligatorily coherent verb *wollen*, but it can occur there when embedded under the optionally coherent verb *versuchen* or the obligatorily incoherent verb *empfehlen*.

(34) a. * Er wird [das Pferd verkaufen] noch heute wollen.
he will the horse sell still today want to

b. Er wird [das Pferd zu verkaufen] noch heute versuchen.
he will the horse to sell still today try

c. Er wird [das Pferd zu verkaufen] ihr noch heute empfehlen.
he will the horse to sell her still today advise

3.1.4. *Scrambled partial VPs*
Partial verbal complements can never occur at the beginning of the *Mittelfeld*. Thus, the occurrence of the partial infinitive *zu verkaufen* at the beginning of the *Mittelfeld* in example (35) is ungrammatical with all three verbs, the obligatorily coherent verb *scheinen*, the optionally coherent verb *versuchen*, and the obligatorily incoherent verb *verzichten*.

(35) * Er scheint / versucht / verzichtet [zu verkaufen] *das Pferd*.
he seems tries foregoes to sell the horse
He seems to sell / tries to sell / foregoes selling the horse.

Askedal (1983, p. 187) discusses the following set of examples with scrambled partial VP complements in the *Mittelfeld*, which seem to be significantly better than the ones presented above.[7]

(36) a. Den alten Wagen hat er [zu fahren] noch nicht gelernt.
this old car has he to drive still not learned
He still has not learned to drive this old car.

b. Nach dem Vornamen des Fremden hat er [sie zu fragen]
after the first name of the foreigner has he her to ask
niemals gewagt.
never dared
He never dared to ask her for the first name of the foreigner.

c. Zahlreiche Bedeutungen ist er [auszudrücken] nicht
many meanings he is to express not
imstande.
capable
He is not able to express many meanings.

In contrast to the ungrammatical examples in (35), the partiality of the VP in the *Mittelfeld* in the examples in (36) results from topicalization of the complement from the VP. If one analyzes such examples of partial VPs as full VPs containing a trace for the topicalized element, the grammaticality of the examples in (36) patterns nicely with that of examples showing scrambled complete VP complements of incoherently constructing verbs, which we showed in (34b) and (34c).[8]

3.1.5. *Scrambled complements of an infinitival complement*
Finally, in sentences with a coherent verb, an argument of the verbal complement can occur at the beginning of the *Mittelfeld*.

[7] Askedal (1983, p. 187) himself marks these examples with a '?'.

[8] Note that such an analysis of the examples in (36) is not in line with the freezing effect we discussed in the context of example (17). However, we are not aware of empirical support for the assumption that the freezing effect applies to incoherent infinitives in the word orders shown in (36). It remains to be shown whether these infinitives are actually moved in the sense relevant for the effect to apply and, if these sentences do constitute a freezing effect configuration, whether the effect in German can be observed for incoherent infinitives.

(37) a. Noch heute wird *es* der Mann [verkaufen] wollen.
still today will it the man sell want to
The man will want to sell it today.

b. Noch heute wird *es* der Mann [zu verkaufen] versuchen.
still today will it the man to sell try
The man will try to sell it today.

c. * Noch heute wird *es* der Mann [zu verkaufen] empfehlen.
still today will it the man to sell advise
The man will advise selling it today.

Thus, the occurrence of the complement of the embedded infinitive *(zu) verkaufen*, the pronoun *es*, at the beginning of the *Mittelfeld* is grammatical only with the coherently constructing verbs *wollen* and *versuchen* in (37a) and (37b) whereas it is ungrammatical with the incoherent verb *empfehlen* in (37c).

3.2. *Adjectival complements*

After this sketch of the main properties of partial VPs on the basis of Bech's distinction between three classes of verbal complement taking verbs, partial APs can straightforwardly be characterized as behaving like the partial verbal complements of obligatorily coherent verbs (cf., G. Müller, 1993; S. Müller, 1999, p. 353). Firstly, a partial AP can be topicalized as shown in (38).

(38) a. [Stolz] ist er *auf seine Kinder* gewesen.
proud is he of his children been
He was proud of his children.

b. [Treu] will er *seiner Frau* für immer bleiben.
faithful wants to he his wife for ever remain
He will forever remain faithful to his wife.

Secondly, neither a partial (39a) nor a complete AP (39b) can occur at the beginning of the *Mittelfeld*. This is parallel to the behavior of the verbal complements of obligatorily coherent verbs shown in example (35) and (34).

(39) a. * Er ist [stolz] im letzten Jahr *auf seine Kinder* gewesen.
he is proud in the last year of his children been
Last year he was proud of his children.

b. * Er ist [stolz auf seine Kinder] im letzten Jahr gewesen.
he is proud of his children in the last year been

Finally, the complement of the AP can occur at the beginning of the *Mittelfeld* (40), just like the argument of the verbal complement of a coherently constructing verb which was shown in (37a).

(40) Er ist *auf seine Kinder* im letzten Jahr [stolz] gewesen.
he is of his children in the last year proud been
Last year, he was proud of his children.

Note that the PP complement *auf seine Kinder* is known to appear independently of its adjectival head *stolz* at the beginning of the *Mittelfeld* since the adverbial phrase *im letzten Jahr*, which intervenes between the adjective *stolz* and its complement *auf seine Kinder*, modifies the predicate *gewesen*. The alternative analysis of combining the adverbial phrase *im letzten Jahr* with the adjective *stolz* is not available, as is suggested by the fact that the combination of the adverbial with the adjective in attributive use is ruled out (41a) whereas such a construction is possible for other adverbials like *immer* (41b).

(41) a. * ein auf seine Kinder im letzten Jahr stolzer Vater
an of his children in last year proud father
a father who was proud of his children last year

b. ein auf seine Kinder immer stolzer Vater
an of his children always proud father
a father always proud of his children

The facts presented in this section make it plausible to analyze APs analogous to the verbal complements of coherently constructing verbs in that the arguments of the adjectival head are obligatorily raised to become the arguments of a head cluster.

3.3. *Nominal complements*

The third kind of partially occurring constituents we are interested in, nominal complements selecting a PP argument, in some respects behave like verbal complements of optionally coherent verbs. Firstly, the nominal complements can be partially topicalized as we saw in (1b) repeated here as (42), which is parallel to the verbal complements of coherently constructing verbs in (32).

(42) [Ein Buch] hat Hans *über Syntax* ausgeliehen.
a book has Hans on syntax borrowed
Hans borrowed a book on syntax.

And like the verbal complements of incoherently constructing verbs (34b), the complete NP can occur at the beginning of the *Mittelfeld* as exemplified in (43).

(43) Er hat [ein Buch über Syntax] heute ausgeliehen.
he has a book on syntax today borrowed
Hans borrowed a book on syntax today.

However, unlike the other partial constituents discussed so far, even a partial NP can occur at the beginning of the *Mittelfeld* (44).

(44) Er hat [kein einziges Buch] während seines Studiums *über*
he has not a single book during his studies on
Syntax ausgeliehen.
syntax borrowed
During his studies, he did not borrow a single book on syntax.

Finally, parallel to the behavior of arguments of verbal complements selected by a coherently constructing verb as in (37a), the complement of the NP can occur at the beginning of the *Mittelfeld* (45).

(45) Er hat *über Syntax* während seines Studiums [kein einziges
he has on syntax during his studies not a single
Buch] ausgeliehen.
book borrowed

We conclude that partial NPs do not pattern with partial APs or one of the classes of partial VP complements. Rather, a partial NP and its PP argument behave just like two independent sister constituents.

Before we now turn to partial constituents embedded in VPs, it remains to be mentioned that the occurrence of partial NPs discussed above is subject to lexical restrictions. A discussion of these restrictions and how they can be integrated into our account is provided in De Kuthy (2001, 2000). She also situates the empirical phenomenon discussed here in the context of other phenomena involving partial NPs, such as the so-called Split NPs, *was-für* split, *w-alles* split, partitive split, or instances of quantifier floating.

3.4. *Partial constituents embedded in (partial) VPs*

An interesting aspect of partial constituents is that they can occur embedded inside of fronted verbal constituents, as illustrated by (46).

(46) a. [Verkaufen müssen] wird er *das Pferd*.
sell have to will he the horse
He will have to sell the horse.

b. [Stolz gewesen] ist er *auf seine Kinder*.
proud been is he of his children
He was proud of his children.

c. [Ein dickes Buch ausleihen] will niemand *darüber*.
a thick book borrow wants to nobody on-this
Nobody wants to borrow a thick book on this topic.

In example (46a), the partial VP *verkaufen*, leaving behind its complement *das Pferd*, is fronted together with its governor *müssen*. In (46b), the partial AP *stolz* is fronted within a VP, and in (46c) the NP *ein Buch* is fronted as part of a VP without its complement *darüber*.

The verb *ausleihen* used as a transitive verb in example (46c) can also occur as a ditransitive, with the additional object naming the recipient. Example (47) shows that when the verb is fronted with the (partial) direct object, the indirect object can also remain in the *Mittelfeld*. The sentence thus includes two partial constituents, one embedded in the other: the fronted VP *ein Buch ausleihen* is partial since it lacks its indirect object *ihr*, and the direct NP object *ein Buch* fronted as part of the VP is partial since it is missing its complement *darüber*.

(47) [Ein Buch ausleihen] will er *ihr darüber* aber nicht.
a book lend wants to he her on-this but not
But he does not want to lend her a book on this topic.

Finally, one can observe that the reverse case, namely a topicalization including an argument of the complement instead of the partial complement, is always ungrammatical (48).

(48) a. * [Das Pferd müssen] wird er *verkaufen*.
the horse have to will he sell

b. * [Auf seine Kinder gewesen] ist er *stolz*.
of his children been he is proud

c. * [Über Syntax ausleihen] will er *ihr ein Buch*.
on syntax lend wants to he her a book

Example (48a) shows that the NP complement of *verkaufen* cannot form a constituent with the verb *müssen* selecting the verb *verkaufen* as part of the *Mittelfeld*. In (48b), the topicalization of the PP complement of the adjective *stolz* together with the verbal head *gewesen* but without the adjective *stolz* is equally ungrammatical. The situation is the same in example (48c), where the PP complement of the noun *Buch* forms a constituent with the verb *ausleihen* while the NP *ein Buch* selected by that verb remains in the *Mittelfeld*.

The ungrammaticality of the examples in (48) appears to be independent of the category of the complement, i.e., verbal (*verkaufen*) in (48a), adjectival (*stolz*) in (48b), and nominal (*ein Buch*) in (48c).

Instead, we believe that an explanation of the ungrammaticality must result from a general restrictions on how embedded complements reanalyzed as co-arguments of their head can be realized. If as the result of a reanalysis process a head selects both a complement and a complement of this complement then it can only combine with the indirect complement if the direct complement is realized in the projection of this head as well. This generalization correctly rules out the ungrammatical examples above. And, independent of whether a flat or binary branching *Mittelfeld* structure is assumed, it does not overgeneralize in a way which would rule out the grammatical examples with partial NPs at the beginning of the *Mittelfeld*, which were shown in (20b).

A superficially similar set of examples is shown in (49). However, while in the examples in (48) each topicalized constituent contains the argument of its complement, in (49) only a verbal head has been fronted, leaving behind its entire verbal (49a), adjectival (49b), or a nominal complement in the grammatical example (49c).

(49) a. * [Müssen] wird er *das Pferd verkaufen.*
have to will he the horse sell

b. * [Gewesen] ist er *auf seine Kinder stolz.*
been is he of his children proud

c. [Ausleihen] will niemand *ein dickes Buch darüber.*
borrow wants to nobody a thick book on-this

The pattern of grammaticality in (49) becomes transparent as soon as one realizes that it is the class of the verb that has been fronted and not the category of complement which determines grammaticality in such examples. The verb *müssen* in (49a) obligatorily constructs coherently, and, as we showed in section 3.2, constructions with an adjectival complement as in (49b) behave parallel to obligatorily coherent ones. Verbs with nominal complements as in (49c), on the other hand, do not pattern with verbs in coherent constructions.

That coherence is the relevant factor is supported by the existence of grammatical examples which are parallel to the ungrammatical (49a) except for the class of the fronted verb. In (50a), the optionally coherent verb *versuchen* and in (50b) the obligatorily incoherent verb *empfehlen* has been topicalized.

(50) a. [Versuchen] wird er *das Pferd zu verkaufen.*
try will he the horse to sell

He will try to sell the horse.

b. [Empfehlen] wird er ihr *das Pferd zu verkaufen.*
advise will he her the horse to sell

He will advise her to sell the horse.

4. An HPSG Proposal

In the empirical discussion in the last two chapters, we established that a reanalysis-like approach to partial constituent fronting is a very promising alternative to an analysis involving remnant movement. In this section, we show how a reanalysis-like approach can be formalized in an HPSG setup.

We start with a brief introduction of some basic assumptions, in particular the analysis of coherent non-finite constructions on which our proposal will be based. We saw in section 3.1 that coherently selected verbal complements can be partially fronted, which is illustrated in (51) with the coherent verb *wird* selecting a verbal cluster.

(51) [Hören wollen] wird er das Meer.
hear want will he the sea

The interesting issue behind such a coherent construction is how the subcategorization requirement of the main verb *hören* can be linked to the occurrence of the object *das Meer* in the *Mittelfeld*. One idea pursued in the HPSG paradigm is the following:[9] When a verb V″ combines with its verbal governor V′ instead of with its own arguments, the resulting constituent must take over the unrealized subcategorization requirements of V″. To formalize this inheritance of subcategorization requirements, Johnson (1986) suggested to incorporate the idea of functional composition from categorial grammar (Geach, 1970) into GPSG. Hinrichs and Nakazawa (1989) picked up this idea and showed how the relevant aspect of functional composition can be integrated into the HPSG architecture in the form of a specific lexical specification of coherently constructing verbs. This lexical specification often referred to as *argument attraction* or *argument raising* adds the unsaturated subcategorization requirements of the verbal complement to the subcategorization requirements of the verbal head.[10]

[9] To situate our proposal, we here focus on the HPSG approaches. For two influential approaches to this problem in the principles and parameters paradigm see Evers (1975) and Haegeman and van Riemsdijk (1986).

[10] It is interesting to note that the formulation of argument attraction as a lexical specification differs from the original functional composition rule of categorial grammar on which it was modeled. With functional composition, the subcategorization requirements of the complement are transferred to the mother of the construction. In the lexicalized variant of argument attraction in Figure 2, it is the head of the construction which inherits the subcategorization requirements of its complement. Different from the original functional composition, the lexical argument attraction specification thus makes it possible to license completely flat structures since in a single local tree, a verbal head can inherit arguments from any of the verbs lower in the government chain and realize them together with its own arguments.

To illustrate this specification, the relevant part of the lexical entry of the obligatorily coherent verb *wollen* is shown in Figure 2. The

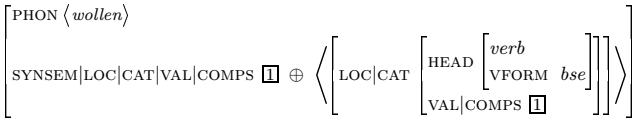

Figure 2. Argument attraction as part of the lexical entry of *wollen*

verb is specified to require a base form verbal complement plus any complement requirements 1 which are not yet realized by the verbal complement. The infix operator ⊕ here represents the append relation concatenating the list of unrealized requirements of the verbal complement before the singleton list holding the requirement for that verbal complement.

Pollard (1996) discussed how this argument-raising specification can be applied to license partially fronted verbal complements. With respect to the example (51) above, the lexical entry of *wollen* in Figure 2 and a parallel argument-raising specification as part of the lexical entry of *wird* take care of establishing the relation between *hören* and its complement in the *Mittelfeld*. The verb *wollen* raises the complement *das Meer* from its verbal complement *hören* and the verb-second verb *wird* raises that argument from the COMPS list of *wollen* onto its own subcategorization requirements, from which it is realized together with the subject as part of the *Mittelfeld*.

We will base our approach to partial constituent fronting developed in the following on this argument-raising technique, which can be viewed as capturing the spirit of a reanalysis rule lifting the argument of an embedded head to a higher head, such as the rule of Fanselow we saw in Figure 1 above. While previous HPSG argument-raising approaches focused on the coherent construction, in the empirical discussion in section 3 we saw that partial constituent fronting is a more general phenomenon involving partial NPs and APs as well. We thus want to introduce argument raising as a general option for verbal heads with different kinds of complements.

Before we can turn to the formalization of this idea, we need to make explicit what we here mean by 'general option'. As discussed above, previous HPSG approaches introduce argument raising as part of the lexical specification of coherently constructing verbs. Argument raising in these setups thus is an idiosyncratic specification in particular lexical entries. On the other hand, Meurers (1997a, 1997b) showed that argument raising can also be introduced as a generalization in the mapping between the argument structure and the valence specifications

of verbs. To express this generalization over the class of verbal words, one can specify lexical principles, i.e., implicational universal principles with descriptions of words as antecedent.[11] Lexical principles thus are parallel to the phrasal principles standardly assumed in HPSG to express constraints on particular phrases, such as the Head Feature Principle as constraint on all headed phrases.

We start presenting our proposal with the lexical entries licensing the words on which the lexical principle introducing argument-raising will then be defined in the following section.

4.1. *The lexicon*

In the lexicon, we assume the argument structure of each word to be specified under the ARG-ST attribute.[12] The relevant part of the lexical entries for the three different kinds of verbs selecting non-finite complements is shown in Figure 3. The three kinds of entries differ with respect to the LEX property required of the verbal complement. Following Kiss (1995) and Hinrichs and Nakazawa (1994a), we want to enforce a verbal cluster for coherently constructing verbs. In our setup, obligatorily coherent verbs like *wollen* mark their verbal complement as [LEX +] whereas obligatorily incoherent verbs like *empfehlen* require it to be [LEX −]. The lexical entry of an optionally coherent verb like *hoffen* is underspecified and enforces no LEX restrictions on its complement.[13]

Intuitively, requiring a complement to be [LEX −] in our setup corresponds to the X-bar theory condition that non-heads have to be completed projections. There are, however, two crucial differences between the X-bar theory condition and how its effects are captured by the LEX requirements in our theory. Firstly, the LEX property of a sign does not correspond directly to the sign's valence properties, i.e., there can be [LEX +] elements which are partially or fully ([COMPS ⟨⟩])

[11] See Meurers (1999b, ch. 4) for more details on lexical principles in contrast to macros or templates and a general discussion of vertical and horizontal lexical generalizations in HPSG.

[12] The ARG-ST attribute is specified explicitly or derived by some kind of a linking theory (cf., e.g., Wechsler, 1995; Davis, 1996; Kordoni, 2000), an issue which is independent of the topic of this paper. We assume that ARG-ST is appropriate for *word* only, and thus this information neither projects nor can it be selected for. The idea behind this is that ARG-ST serves as a strictly lexical interface between the semantic roles of a predicate and their syntactic realization. The valence features SUBJ, SPR, and COMPS, on the other hand, play the traditional role of encoding syntactic selection requirements.

[13] A different kind of encoding for the three classes of verbs is proposed by Kathol (1995) and S. Müller (1999). They employ a special valence attribute (GOV or VCOMP) for complements of coherently constructing verbs. This, however, results in two lexical entries for each optionally coherent verb instead of the underspecified single entry in the LEX encoding we propose here.

obligatorily coherent verbal complement:

$$\begin{bmatrix}\text{PHON} & \langle \textit{wollen} \rangle \\ \text{SYNSEM|LOC|CAT|HEAD} & \begin{bmatrix}\textit{verb} \\ \text{VFORM} \quad \textit{bse}\end{bmatrix} \\ \text{ARG-ST} & \left\langle \left[\text{LOC|CAT|HEAD} \quad \textit{noun}\right], \begin{bmatrix}\text{LOC|CAT|HEAD} & \begin{bmatrix}\textit{verb} \\ \text{VFORM} \quad \textit{bse}\end{bmatrix} \\ \text{LEX} & + \end{bmatrix} \right\rangle \end{bmatrix}$$

obligatorily incoherent verbal complement:

$$\begin{bmatrix}\text{PHON} & \langle \textit{empfehlen} \rangle \\ \text{SYNSEM|LOC|CAT|HEAD} & \begin{bmatrix}\textit{verb} \\ \text{VFORM} \quad \textit{bse}\end{bmatrix} \\ \text{ARG-ST} & \left\langle \left[\text{LOC|CAT|HEAD} \quad \textit{noun}\right], \begin{bmatrix}\text{LOC|CAT|HEAD} & \begin{bmatrix}\textit{verb} \\ \text{VFORM} \quad \textit{zu-inf}\end{bmatrix} \\ \text{LEX} & - \end{bmatrix} \right\rangle \end{bmatrix}$$

optionally coherent verbal complement:

$$\begin{bmatrix}\text{PHON} & \langle \textit{hoffen} \rangle \\ \text{SYNSEM|LOC|CAT|HEAD} & \begin{bmatrix}\textit{verb} \\ \text{VFORM} \quad \textit{bse}\end{bmatrix} \\ \text{ARG-ST} & \left\langle \left[\text{LOC|CAT|HEAD} \quad \textit{noun}\right], \left[\text{LOC|CAT|HEAD} \quad \begin{bmatrix}\textit{verb} \\ \text{VFORM} \quad \textit{zu-inf}\end{bmatrix}\right] \right\rangle \end{bmatrix}$$

Figure 3. Lexical entries for verbs with infinitival complements

saturated, and there can be [LEX −] elements that are not fully saturated ([COMPS *ne-list*]). The correlation between the LEX and the valence properties is established only indirectly, via the interaction between the LEX requirements lexically imposed on the selected complements and the ID schemata discussed in section 4.2. Secondly, the X-bar theory is a condition on structures whereas the LEX attribute lexicalizes the 'trigger' for this restriction. The lexicalization makes it possible to relax the requirement for the class of verbal heads which construct coherently with their non-finite complement. Introducing the requirement on the complement via a lexical specification in this way appears to be the proper way to capture the data since the coherence of a construction depends solely on the lexical class of the verbal head.

In a coherent construction, the verbal head directly combines with the head of its complement in order to form a verbal cluster. This is achieved by requiring the complement of verbs constructing coherently to be [LEX +]. In case of obligatorily coherent verbs this is specified in the lexical entry; for the optionally coherent ones in a coherent construction it follows from the argument-raising principle discussed below.

Note that we do not assume that words in the lexicon have to be [LEX +]. This makes it possible to license simple words as complements or subjects without requiring an otherwise unmotivated unary tree to project these elements. Regarding our particular topic, it allows us to license words as incoherent complements in sentences like (52), where the infinitive *zu gehen* has to be [LEX −] to be permitted as complement of the obligatorily incoherent verb *empfiehlt*.

(52) Sie empfiehlt zu gehen.
she recommends to go

Finally, as a result of the feature geometry explained at the end of section 4.2 below, LEX requirements are relaxed for long distance relations like topicalization so that different projections of (partial) VP complements of obligatorily coherent verbs can be topicalized.

In section 3.2 we discussed the fact that adjectival complements of verbs behave parallel to verbal complements of obligatorily coherent verbs. We therefore make use of the same LEX mechanism as in the coherent case and require the adjectival complement in the lexical entry shown in Figure 4 to be [LEX +].

$$\begin{bmatrix}\text{PHON} & \langle \textit{sein} \rangle \\ \text{SYNSEM|LOC|CAT|HEAD} & \begin{bmatrix}\textit{verb} \\ \text{VFORM} \quad \textit{bse}\end{bmatrix} \\ \text{ARG-ST} & \left\langle \left[\text{LOC|CAT|HEAD} \quad \textit{noun}\right], \begin{bmatrix}\text{LOC|CAT|HEAD} & \textit{adjective} \\ \text{LEX} & + \end{bmatrix} \right\rangle \end{bmatrix}$$

Figure 4. Lexical entry for a verb selecting an adjectival complement

Turning to the third class of verbs we are interested in, we need to provide an entry for verbs with nominal complements. We saw in section 3.3 that the occurrence of complete or partially saturated nominal complements is not subject to the restrictions holding for verbal or adjectival complements. The lexical entry shown in Figure 5 therefore

$$\begin{bmatrix}\text{PHON} & \langle \textit{ausleihen} \rangle \\ \text{SYNSEM|LOC|CAT|HEAD} & \begin{bmatrix}\textit{verb} \\ \text{VFORM} \quad \textit{bse}\end{bmatrix} \\ \text{ARG-ST} & \left\langle \left[\text{LOC|CAT|HEAD} \quad \textit{noun}\right], \left[\text{LOC|CAT|HEAD} \quad \textit{noun}\right] \right\rangle \end{bmatrix}$$

Figure 5. Lexical entry for a verb selecting a nominal complement

does not impose a restriction regarding the LEX value of its nominal complement.

4.1.1. *The lexical argument-raising principle*
The lexical principle shown in Figure 6 expresses how the argument structure specified in the ARG-ST list of the lexical entries of base form verbs determines the values of the valence attributes (SUBJ and COMPS).

$$\begin{bmatrix} word \\ \text{S|L|C|HEAD} \begin{bmatrix} verb \\ \text{VFORM} \quad bse \end{bmatrix} \end{bmatrix} \rightarrow \begin{bmatrix} \text{S|L|C|V} \begin{bmatrix} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & raised(\boxed{3}) \oplus \boxed{2} \end{bmatrix} \\ \text{ARG-ST} \quad \langle \boxed{1} \mid \boxed{2} \rangle \quad \wedge \quad (\boxed{3} \bigcirc indep) \end{bmatrix}$$

Figure 6. The basic lexical argument-raising principle[15]

The first element (1) of the argument structure is assigned to be the subject, and the rest of the arguments (2) are specified to surface on the COMPS list. To concentrate on the relevant issues, we here ignore subjectless and subject-raising verbs and return to the issue below when we introduce a more complete version of the principle.

Appended ($\oplus$) to the beginning of the COMPS list are the arguments possibly raised from an element on list 3.[16] The list 3 can only contain an element, the so-called *argument-raising source*, if it satisfies the requirements specified in the relation *raised* discussed below. For many of the verbs, 3 will thus simply be the empty list from which no arguments can be raised.

To the right of the conjunction ($\wedge$) in the specification of ARG-ST, a second restriction on the argument structure is formulated. Intuitively speaking, this restriction singles out the argument-raising source (if there is one) and requires all other elements on ARG-ST to be *indep(endent)*, a notion encoding that these arguments have realized their own complements. Formally, the argument-raising source is picked out from the list of independent arguments by shuffling ($\bigcirc$) the list 3 into the list of independent arguments. The list 3 is either an empty list or a singleton list containing an argument-raising source. In the latter case, shuffling corresponds to inserting the argument-raising source at any place in the list. Note that any argument can be an argument-raising source, including the subject. This correctly licenses the occurrence of partial subjects in examples like the ones we showed in (10).

[15] Here and throughout the paper, relations are written in the functional notation commonly used in HPSG; the operator $\oplus$ stands for list concatenation (*append*) and $\bigcirc$ for shuffling of two lists as explained in the text below. For space reasons, attribute names are sometimes abbreviated by their first letter, in particular P(HONOLOGY), S(YNSEM) L(OCAL), C(ATEGORY), V(ALENCE), H(EAD), N(ONLOCAL), I(NHERITED), T(O-BIND), and A(RGUMENT-STRUCTURE).

[16] Note that we assume argument raising to only take place on the COMPS attribute, not on ARG-ST. As discussed by S. Müller (1999, sec. 20.4.2), circular o-command relations result if the binding theory operates on raised arguments, a finding which supports our restrictive use of ARG-ST as described in fn. 12. A more extended use of ARG-ST is proposed for French by Abeillé et al. (1998).

The unary relation *indep(endent)* is defined in Figure 7. A list is

$$indep := \langle\rangle.$$
$$indep := \left\langle \begin{bmatrix} \text{L|C|V|COMPS} & \langle\rangle \\ \text{LEX} & - \end{bmatrix} \middle|\ indep \right\rangle.$$

Figure 7. Definition of independence

independent if it only contains elements which have realized all of their complements and are [LEX −]. An element on such an independent list thus cannot contribute its complements to an argument-raising process, and it cannot occur as part of a lexical head cluster. The intuition behind calling such (a list of) elements independent is that they independently take care of realizing their own complements.

The relation *raised* defined in Figure 8 parameterizes the argument-raising principle of Figure 6 with respect to the different kinds of argument-raising sources. The first clause specifies that if there is no

$$raised(\langle\rangle) := \langle\rangle.$$
$$raised\left(\left\langle \begin{bmatrix} \text{LEX} & + \\ \text{L|C} & \begin{bmatrix} \text{HEAD} & verb \vee adj \\ \text{V|COMPS} & \boxed{1} \end{bmatrix} \end{bmatrix} \right\rangle\right) := \boxed{1}\ lex\text{-}minus\text{-}list.$$
$$raised\left(\left\langle \begin{bmatrix} \text{L|C} & \begin{bmatrix} \text{HEAD} & noun \\ \text{V|COMPS} & \boxed{1} \end{bmatrix} \end{bmatrix} \right\rangle\right) := \boxed{1}\ prep\text{-}list.$$

Figure 8. Definition of possible argument-raising sources

argument-raising source, no arguments can be raised. Note that this is the only clause that is applicable when the lexical argument-raising principle of Figure 6 applies to obligatorily incoherent verbs such as *empfehlen* since we saw in Figure 3 that the lexical entry of such a verb requires its verbal complement to be [LEX −]. As a result, the tag 3 in the lexical argument-raising principle for obligatorily incoherent verbs is the empty list, and the arguments of obligatorily coherent verbs are required to be *indep*, i.e, fully saturated.

The second clause of the definition of *raised* deals with adjectival and verbal argument-raising sources, which are restricted to be [LEX +]. The relation *raised* returns the complements which were not realized by the argument-raising source itself (and thus still occur on its COMPS list) in order for them to become complements of the embedding verb to which the argument-raising principle applied. The raised complements are required to be [LEX −] by the relation *lex-minus-list*.[17] Taken

[17] We here employ the relation *lex-minus-list* and not the relation *indep* of Figure 7 since we do not want to exclude raising of NPs which are unsaturated since a PP argument was raised from them. The relation *lex-minus-list* is defined as:

together, the two LEX specifications (adjectival and verbal argument-raising sources are [LEX +], and raised complements [LEX −]) ensure that verbal or adjectival heads from which arguments have been raised cannot be raised themselves.[18] As a result, in a sentence like (53) with several coherently constructing verbs functioning as argument-raising sources, no spurious structural ambiguities arise since only the indicated binary verbal-complex structure, and not a flat structure, can be licensed.[19]

(53) daß er sie [ansehen$_3$ können$_2$] muß$_1$
that he her see can must
That he must be able to take a look at her.

The obligatorily coherent verbs *können* and *muß* have a lexical entry like *wollen* in Figure 3. The verb *muß* cannot raise the verbal complement *ansehen* of its verbal complement *können* because *ansehen* would then have to be [LEX −], but the lexical entry of an obligatorily coherent verb like *können* requires its verbal complement to be [LEX +]. Instead, in our analysis of example (53), *können* raises the object *sie* of *ansehen*. The finite verb *muß* then raises *sie* from the verbal cluster [*ansehen können*] and realizes the subject *er*, the object *sie*, and the verbal cluster *ansehen können* in a flat structure.

Finally, the third clause of the definition of the *raised* relation in Figure 8 deals with nominal argument-raising sources. In this case, we restrict the elements which can be raised to prepositional arguments

lex-minus-list := ⟨⟩.
lex-minus-list := ⟨[LEX −]| *lex-minus-list*⟩.

[18] The necessity to require this explicitly with the help of the *lex-minus-list* relation is a result of the lexicalized argument-raising encoding assumed in HPSG as introduced by Hinrichs and Nakazawa (1989). The original functional composition analysis from categorial grammar (Geach, 1970) does not require such a specification since it licenses argument raising only in structures where both the head and the unsaturated complement are realized so that raising the unsaturated complement itself is not an option.

[19] The binary verbal-complex structures licensed in this paper are uniformly left-branching, in line with most proposals except for Kiss (1995). In Meurers (1999b, ch. 3 & 8) we argue that at least some right-branching verbal-complex structures need to be assumed in order to capture the so-called *Zwischenstellung* or *lower-field split* phenomenon as exemplified by (i) below. An alternative, linearization-based approach to this phenomenon is provided by Kathol (1998).

(i) Zu dem Zeitpunkt, an dem ich mich entscheiden$_3$ hätte$_1$ müssen$_2$, war das
at the time at which I me decide would.have had.to was the
Gesangsbuch wichtiger.
hymn.book more.important
At the time at which I would have had to decide, the hymn book was more important.

(*prep-list*).[20] No restriction on the argument-raising source is imposed since a partial NP and its PP complement are supposed to occur as two ordinary sister constituents in the *Mittelfeld*. To license them as independent sister constituents in sentences with a verbal complement, we need to allow nominal heads from which a PP argument has been raised to be raised as well — a case which is excluded for the verbal and adjectival complements via the LEX specifications in the second clause.

The use of the LEX attribute and its interaction with argument raising introduced above for different kinds of complement selecting verbs in German bears an interesting similarity to the approach of Abeillé and Godard (1999) dealing with French word order phenomena. They distinguish between phrasal complements occurring freely to the right of the head and bare complements immediately following the head. Examples for such bare complements, which are referred to as *lite*, are bare nominal complements in light-verb constructions, past participles after tense auxiliaries, and infinitives in causative constructions. A verb lexically specifies whether it selects a lite or a non-lite complement via a WEIGHT attribute similar to the LEX attribute we employ. Verbs selecting a lite complement are lexically specified to inherit the arguments of its complement. The similarity of the techniques used in the approach of Abeillé and Godard (1999) to French and our approach to German provides interesting cross-linguistic support for the elaborate use of an argument-raising technique. As far as we see, our theoretical setup, which minimizes idiosyncratic lexical specification by introducing argument raising as a generalization over all verbs and enforces an obligatory form of argument raising that avoids spurious ambiguities, could fruitfully be applied to the approach to French of Abeillé and Godard (1999).

4.1.1.1. *Extensions for subjectless constructions* Returning to the issue of distributing the argument structure to the different valence attributes in a general way including the case of subjectless and subject-raising predicates, we provide an extended version of the argument-raising principle in Figure 9. This principle is identical to the basic principle we showed in Figure 6 except for the way in which the ARG-ST list is related to the COMPS and SUBJ values. Instead of the simple

[20] We have only considered prepositional arguments of nominal heads in this paper. Other kinds of complements of nouns, such as verbal or genitive-NP complements, cannot be separated from their head in the way described for PP complements. Further research is needed to investigate whether this difference can be deduced from independent properties in order to eliminate the *prep-list* specification in the definition of the argument-raising sources in Figure 8. The unary relation *prep-list* is defined as follows:

prep-list := ⟨⟩.
prep-list := ⟨[L|C|HEAD *prep*]| *prep-list*⟩.

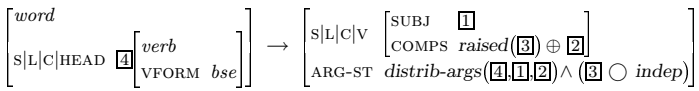

Figure 9. An extended lexical argument-raising principle

first/rest division used in the basic principle, the more complicated task is now taken over by a separate relation *distrib(ute)-arg(ument)s* which parameterizes the argument-raising principle depending on the lexical subclass of the verb. Generally speaking, the relation *distrib-args* distributes the elements on ARG-ST depending on the head value 4: at most one element is mapped onto the subject valence attribute (1), and the rest of the ARG-ST elements make up part of the COMPS list (2).

Let us take a look at this relation in more detail, starting with the different head values determining the mapping. Every linguistic theory will have to provide a way of distinguishing those verbs which require a subject from those which do not. Either this can be derived from other lexical properties, or it has to be explicitly encoded in the verbal lexical entry. For the purpose of this paper, it is sufficient to assume the existence of such a distinguishing property. As a simple way of making this property explicit, we encode this subclassification of verbs in the form of subtypes of the head type *verb*. The definition of the *distrib-args* relation based on such a subclassification of verbal head types is shown in Figure 10.

$$\textit{distrib-args}(\textit{subj-less-verb}, \langle\rangle, 2) := 2$$

$$\textit{distrib-args}(\textit{subj-raising-verb}, 1, 2) := 2\left\langle [\text{L|C|V|SUBJ } 1] \right\rangle$$

$$\textit{distrib-args}\left(\textit{subj-verb}, \langle 1 \rangle, 2\right) := \langle 1 | 2 \rangle$$

Figure 10. Mapping argument structure to valence

The first clause deals with subjectless predicates such as psych verbs like *frieren* ('*freeze*'). It maps the entire argument structure to the third argument, which the argument-raising principle identifies with the COMPS value. The second argument is set to be the empty list so that no subject can be selected via SUBJ.

The second clause deals with subject-raising verbs like *scheinen* ('*seem*'). First, it identifies the single element on ARG-ST with the third argument of the relation, which in the argument-raising principle is appended to COMPS. Second, it identifies the SUBJ value of that single ARG-ST element with the second argument of the relation, which in the argument-raising principle is identified with SUBJ. Note that this includes the possibility of returning an empty list in cases where a subject-raising verb selects a subjectless predicate.

Finally, for all other verbs the third clause performs the first/rest division which was used in the basic argument-raising principle in Figure 6. A list with the first element of the argument structure is returned as the subject valence, and the other elements are returned to be identified with the COMPS list.

4.1.1.2. *Deriving finite verbs* Before we turn to the principles licensing constituent structure, we should focus on a detail that has not yet been discussed, namely how the lexical argument-raising principle in Figure 6, which applies to base form verbs, becomes effective for finite ones. Finite verbs are assumed to be derived from their base forms by a lexical rule which among other things removes the subject from SUBJ and encodes it together with the complements on COMPS in the tradition of Pollard (1996).[21] In order to be explicit, a simple instance of such a finitivization lexical rule is provided in Figure 11. Relevant

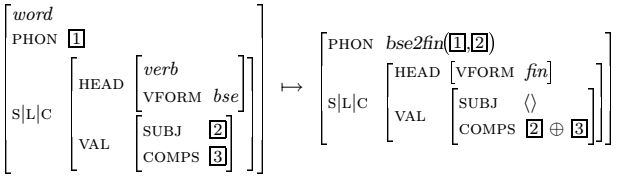

Figure 11. A simple finitivization lexical rule

in our context is that the subject of finite verbs is encoded as the first argument of the COMPS valence. If no such subject exists, 2 is the empty list, and thus the COMPS list contains only the complements. Finally, the relation *bse2fin* transforms the base form into a finite form agreeing with the person and number of the subject, if there is one, and with the third person singular in subjectless constructions.

4.2. *Constituent structure*

Constituent structure is licensed by the ID Principle in Figure 12. Each phrasal constituent with a headed structure has to satisfy one of the immediate dominance schemata on the right-hand side of the implication. The Cluster-Formation Schema (CF) licenses head-complement structures which consist of a *word* and a single [LEX +] complement. The

[21] The question how morphology is integrated into the picture is orthogonal to the topic of this paper. While we here make use of a lexical rule for finitivization, an alternative to lexical rules such as the setup proposed by Krieger and Nerbonne (1993) would equally be possible.

$$\begin{bmatrix} \textit{phrase} \\ \text{DTRS}\ \ \textit{headed-struc} \end{bmatrix} \rightarrow$$

$$\begin{bmatrix} \text{S|LEX}\ + \\ \text{DTRS}\ \begin{bmatrix} \textit{head-comps-struc} \\ \text{HEAD-DTR}\ \ \textit{word} \\ \text{COMP-DTRS}\ \left\langle [\text{S|LEX}\ +] \right\rangle \end{bmatrix} \end{bmatrix} \quad \text{(CF)}$$

$$\vee \begin{bmatrix} \text{S|LEX}\ - \\ \text{DTRS}\ \begin{bmatrix} \textit{head-comps-struc} \\ \text{HEAD-DTR}\ \ \textit{word} \end{bmatrix} \end{bmatrix} \quad \text{(HC)}$$

$$\vee \begin{bmatrix} \text{S|LEX}\ - \\ \text{DTRS}\ \ \textit{head-spr-struc} \end{bmatrix} \quad \text{(HSPR)}$$

$$\vee \begin{bmatrix} \text{S|LEX}\ \boxed{1} \\ \text{DTRS}\ \begin{bmatrix} \textit{head-adj-struc} \\ \text{ADJ-DTR|S}\ \ [\text{L|C|H|MOD}\ \boxed{2}] \\ \text{HEAD-DTR|S}\ \ \boxed{2}[\text{LEX}\ \boxed{1}] \end{bmatrix} \end{bmatrix} \quad \text{(HA)}$$

$$\vee \begin{bmatrix} \text{S|LEX}\ - \\ \text{DTRS}\ \begin{bmatrix} \textit{head-filler-struc} \\ \text{FILLER-DTR|S}\ \begin{bmatrix} \text{LEX}\ - \\ \text{LOC}\ \boxed{1} \end{bmatrix} \\ \text{HEAD-DTR|S}\ \begin{bmatrix} \text{LOC|C}\ \begin{bmatrix} \text{HEAD}\ \begin{bmatrix} \textit{verb} \\ \text{VFORM}\ \textit{fin} \end{bmatrix} \\ \text{VAL}\ \begin{bmatrix} \text{SUBJ}\ \langle\rangle \\ \text{COMPS}\ \langle\rangle \end{bmatrix} \end{bmatrix} \\ \text{NLOC}\ \begin{bmatrix} \text{I|SLASH}\ \ \{\boxed{1}\} \cup \textit{set} \\ \text{T|SLASH}\ \ \{\boxed{1}\} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \quad \text{(HF)}$$

Figure 12. The ID Principle

resulting structure is [LEX +], which marks such lexical clusters as possible verbal complements in a coherent construction. The description [LEX +] in our setup thus refers to two kinds of lexical entities: lexical head clusters and ordinary words. The Head-Complement Schema (HC), on the other hand, allows head-complement structures in which a *word* combines with any number of complements to form a [LEX −] constituent. To abstract over the nature of verb-second and the structure of the *Mittelfeld*, in this paper we thus follow Pollard (1996) in assuming a flat *Mittelfeld* and obtain verb-second as the result of verb-first linearization in this local tree plus fronting of a single constituent.

To license nominal structures, we adopt the Head-Specifier Schema (HSPR) and the Head-Adjunct Schema (HA) of Pollard and Sag (1994). In the style of Pollard and Sag (1994, ch. 9), determiners are selected by

the valence feature SPR. Note that even though the HSPR schema does not require the nominal head to be fully saturated in order to permit raising of arguments from nominal heads, the HC schema ensures that a complement can only be realized as the sister of a nominal *word* and not as the sister of a head-specifier structure.

As was shown in Figure 8, argument raising only affects elements on COMPS, i.e., complements, so that determiners cannot undergo argument raising. In addition to the original formulation of the Head-Specifier and the Head-Adjunct Schema, our versions bear appropriate LEX specifications: head-specifier structures are always [LEX −], and in a head-adjunct structure, the LEX value of the mother is identified with that of the head daughter.[22] While these two schemata are sufficient for our purpose of analyzing partial constituent fronting including the interaction of partial NPs with VP topicalization, naturally a full theory of German nominal constituents is more complicated. The reader interested in more details at this point is referred to Netter (1996, sec. 4.9.2), who discusses how the Pollard and Sag (1994) theory we rely on here can be modified to account for the full range of German NP data.

Finally, unbounded dependencies are bound off in a head-filler structure (HF). For this purpose, we use the standard schema of Pollard and Sag (1994) and add the appropriate LEX specifications. The resulting construction is [LEX −] since it does not constitute a lexical cluster. The filler daughter is required to be [LEX −] as well, which eliminates otherwise possible spurious ambiguities. Empirical support for assuming that the fronted constituent is [LEX −] comes from the fact that, as mentioned by Haider (1993, p. 282), a partial fronted constituent is a possible site for extraposition (54a) whereas this is not possible in the *Mittelfeld* (54b). This suggests that the fronted constituent has a different status than any projection of *empfehlen* in the *Mittelfeld*.

(54) a. [Ein Buch empfehlen, das sie nicht auch selbst gelesen
a book recommend that she not also herself read
hat,] würde dir Maria nie.
has would you Maria never
Maria would never recommend a book to you which she has not read herself.

b. * daß Maria dir kein Buch empfehlen, das sie nicht auch
that Maria you no book recommend that she not also
selbst gelesen hat, würde
herself read has would

[22] Viewing adjunction as an identity operator applicable to categories of different complexity in this way has its roots in the GB literature of the early 90s (see, e.g., Kolb and Thiersch, 1991, p. 273), where it is introduced as an extension of the classical X-bar theoretic view of adjunction as modification of X′.

As usual in HPSG, in an unbounded dependency construction only the *local* information is shared between the filler and the trace.[23] Following S. Müller (1997) and Meurers (1999a) we define LEX as an attribute of *synsem* objects. The fronted constituent and the trace therefore do not have to agree on the LEX specification so that fronted constituents are exempt from a LEX requirement lexically imposed by a head in base position. More concretely, any projection of a (partial) VP complement can be fronted even when selected by obligatorily coherent verbs which require the complement trace to be [LEX +].

4.2.1. *Other principles restricting phrases*
Regarding the other principles, we assume the HPSG architecture of Pollard and Sag (1994, ch. 9). In particular, the SPEC-Principle applies to head-specifier structures to ensure identity of the SPEC value of the non-head with the head. And in headed structures, the different valences are realized according to the Valence Principle shown in Figure 13. Note that this principle requires the elements occurring

> In a headed phrase, for each valence feature $\mathcal{F}$, the $\mathcal{F}$ value of the head daughter is the concatenation of the phrase's $\mathcal{F}$ value with the list of SYNSEM values of the $\mathcal{F}$-DTRS value.

Figure 13. The Valence Principle of Pollard and Sag (1994)

last on a valence list to be realized first. This requirement makes it impossible to combine an argument with a head in a tree that does not also include all of the more oblique arguments.[24] In particular, since the argument-raising principle adds raised arguments in front of the argument-raising source, these raised arguments cannot be realized before the argument-raising source is removed from the COMPS list, i.e., realized as well.[25]

[23] In this paper, we assume an unbounded dependency theory employing traces in the style of Pollard and Sag (1994, ch. 1–8). The differences resulting from combining our argument-raising theory with a traceless analysis of extraction (Bouma et al., 2001) are discussed in De Kuthy and Meurers (1999a).

[24] While the data are not very clear, partial VP topicalization with ditransitive verbs in German seems to be possible with either of the two complements. Kathol (1995, p. 269) suggests to lexically under-determine the order of such complements in order to allow for either realization.

[25] Note that what we have encoded here is a more restrictive variant of the empirical generalization we reached at the end of section 3.4. It is more restrictive in that it requires a complement to be realized before its complements are, instead of only requiring both to be realized as part of the same head projection. While for our flat analysis of the *Mittelfeld* this makes no difference, it excludes some possibly more appealing binary branching analyses of the Mittelfeld of examples like the ones with partial NPs at the beginning of the *Mittelfeld* we showed in (20b).

5. Examples

Now that the relevant machinery has been introduced, let us look at some analyses of the examples we discussed in section 3.

5.1. *Partial Topicalization*

5.1.1. *Partial APs*
We start the discussion with a very simple case of a topicalized partial AP, the example shown in (55).

(55) [Stolz] ist er *auf seine Kinder.*
proud is he of his children
He is proud of his children.

The structure licensed for this sentence is shown in Figure 14. A

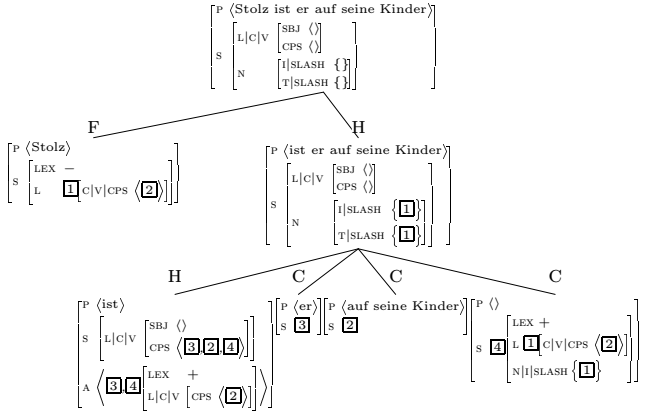

Figure 14. Simple topicalization of a partial AP

lexical entry for the copula *sein* with an adjectival complement was shown in Figure 4. As motivated in the section 3.2 on partial APs, the entry for such a verb is like that of an obligatorily coherent verbal complement taking verb in that it requires its complement to be [LEX +]. As a result of the interaction of this specification with the mapping to the valence attributes enforced by the argument-raising principle, the occurrence of *ist* in the tree in Figure 14 raises the PP-complement *auf seine Kinder* (2) from (the trace of) its adjectival complement *stolz* (4). Therefore, the partial AP *stolz* can be fronted independently of its PP-complement. The finite verb *ist* then realizes the raised PP, the

subject *er*, and the trace of the fronted AP in a flat head-complement structure. Note that since LEX requirements are not mediated in a non-local dependency, it is unproblematic that the trace of the fronted AP is required to be [LEX +] by the lexical entry of *sein* whereas the fronted AP is [LEX −] as specified in the Head-Filler ID Schema.

5.1.2. *Partial VPs*

A slightly more complex case of a topicalized partial constituent is illustrated by the partial-VP example in (56).

(56) [Eine Vase schenken] will er *ihr*.
a vase donate wants-to he her
He wants to give her a vase for a present.

The verbal head *schenken* is fronted with one of its objects *eine Vase* while its second object *ihr* remains behind in the *Mittelfeld*. Figure 15 shows the analysis tree assigned to this example. In Figure 3, we showed

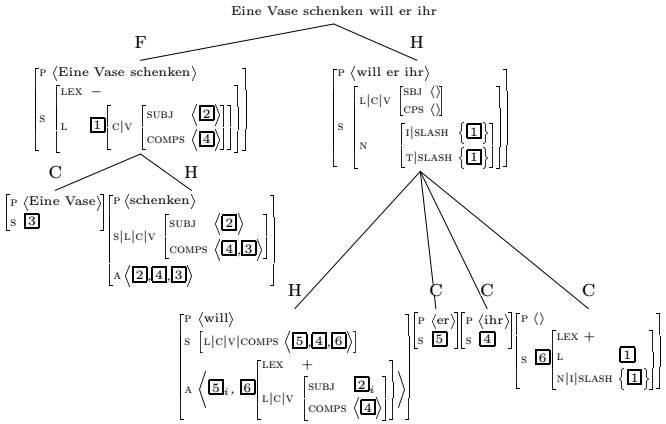

Figure 15. Topicalization of a partial VP

a lexical entry for *wollen*. It is similar to that of the copula discussed in the previous section in that it requires a [LEX +] complement. In addition, following Pollard and Sag (1994) the control relation between the subject of *will* (5) and the subject of *schenken* (2) is included in the lexical entry by semantic coindexation with index *i*, which formally corresponds to a structure sharing of the INDEX values of the respective NPs.

The occurrence of *will* in the tree in Figure 15 raises all complements of the trace of its verbal argument. This is only one NP, *ihr*, because

the fronted verbal head *schenken* already combined with its other NP complement, *eine Vase*. Although the combination of a verbal head and its NP complement results in a [LEX −] constituent, just like in the last example this does not conflict with the [LEX +] specification imposed by the complement of *will* since the unbounded dependency relaxes the LEX requirement. In its base position in the *Mittelfeld*, however, the constituent [*eine Vase schenken*] would not be licensed.

5.1.3. *Partial NPs*

Next, we turn to the analysis of a sentence with a topicalized partial NP, the example shown in (57), which in addition to the simple case (1b) discussed in the introduction includes a verbal complex.

(57) [Ein Buch] hofft jeder *darüber* ausleihen zu dürfen.
a book hopes everyone on-this borrow be-allowed-to
Everyone hopes to be allowed to borrow a book on this topic.

The analysis tree for this example is shown in figure 16.[26] The interesting details are how the fronted partial NP *ein Buch* and the verbal complex [*ausleihen zu dürfen*] are licensed. The argument-raising principle applies to *ausleihen*, the lexical entry of which we saw in Figure 5, so that the NPs on ARG-ST can be argument-raising sources as defined in figure 8. The occurrence of *ausleihen* (1) in the tree in Figure 16 can therefore raise the PP argument *darüber* (3) from its nominal complement.

The verb *dürfen* belongs to the obligatorily coherent verbs; so it has a lexical entry like *wollen* in Figure 3 and requires its verbal complement to be [LEX +]. The argument-raising principle therefore has to raise the (trace of the) NP *ein Buch* (8) and the PP *darüber* (3) from the verbal complement *ausleihen* (1) onto the COMPS requirements of *zu dürfen*.

The verb *hoffen* belongs to the optionally coherent verbs, for which a lexical entry was shown in Figure 3. The argument-raising principle ensures that the occurrence of *hofft* in the tree in Figure 16 raises all independent complements from its verbal complement: the PP *darüber* (3) and the (trace of the) NP *ein Buch* (8). But it cannot raise the verbal complement *ausleihen* since *ausleihen* is [LEX +]. Instead, *ausleihen* and *zu dürfen* form a verbal complex licensed by the VC schema. The verbal complex, the trace of the fronted NP *ein Buch*, the PP *darüber*, and the subject NP *er* are then all realized in a flat head-complement structure.

[26] The two predicates *hoffen* and *dürfen* are subject-control verbs. As before, in Figure 16 the control relationship is indicated by the index *i*.

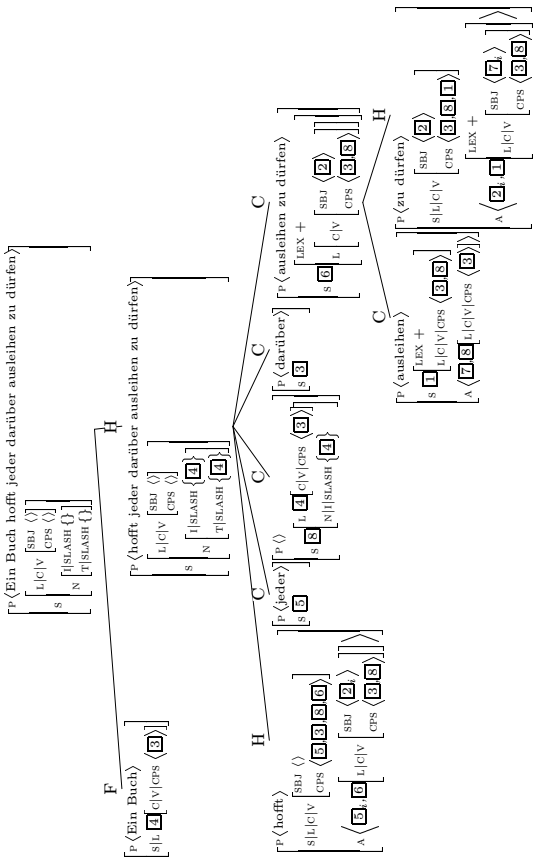

Figure 16. Topicalization of a partial NP

5.1.4. *Some ungrammatical cases*

In section 3.4, we observed that a verb coherently selecting a verbal complement cannot be topicalized without this verbal complement, as shown in example (58):

(58) a. * [Das Pferd müssen] wird er *verkaufen*.
the horse have-to$_{V''}$ will$_{V'}$ he sell$_{V'''}$

b. * [Müssen] wird er *das Pferd verkaufen*.
have-to$_{V''}$ will$_{V'}$ he the horse sell$_{V'''}$

In the following we want to show how examples of the form of (58a) and (58b) are ruled out by our theory. The example (58a), of which the most promising structure is shown in figure 17, is not licensed by our theory for two reasons. Firstly, a conflict arises in the topicalized

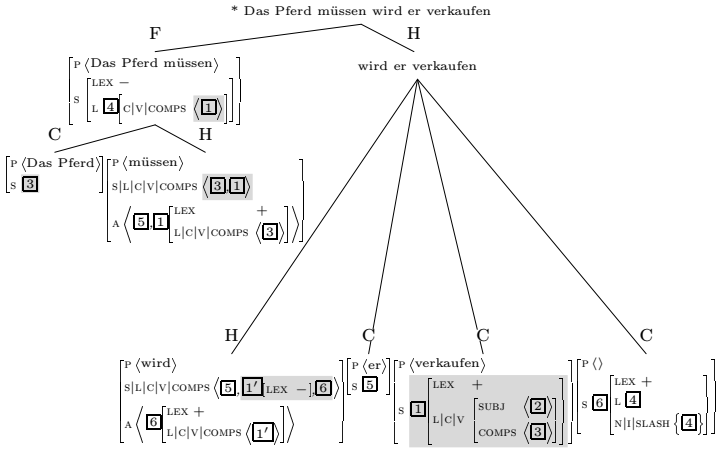

Figure 17. Topicalizing a verb and an argument of its complement

constituent. The obligatorily coherent verb *müssen* raises the NP argument *das Pferd* (3) from its verbal complement *verkaufen* (1). The realization of this raised NP (3) as a complement of *müssen* in the fronted position is, however, ruled out by the Valence Principle since 3 precedes the complement (1) on COMPS, and that complement is not realized in this tree.

The second conflict in this example arises in the *Mittelfeld*: Similar to the verb *will*, the verb *wird* in figure 17 obligatorily raises all complements from its verbal argument (6).[27] Thus it has to raise the remaining

[27] In discussing the ungrammatical examples, we focus on the reason of the ungrammaticality. To fully understand the example, note that verb *wird* in Figure 17

verbal valence requirement (1′) from this verbal argument. The occurrence of the verb *verkaufen* (1) in the tree is unsaturated because it has not realized its nominal complement *das Pferd*. Furthermore, the obligatorily coherent verb *müssen* requires *verkaufen* to be [LEX +]. But according to the argument-raising principle, the raised complement (1′) has to be [LEX −]. This conflicts via the Valence Principle with the different specifications of *verkaufen* (1).

For the example (58b), three potential structures are shown in figures 18–20. All three structures are correctly ruled out by our theory. In the first structure in Figure 18, the verb *verkaufen*, selected by the

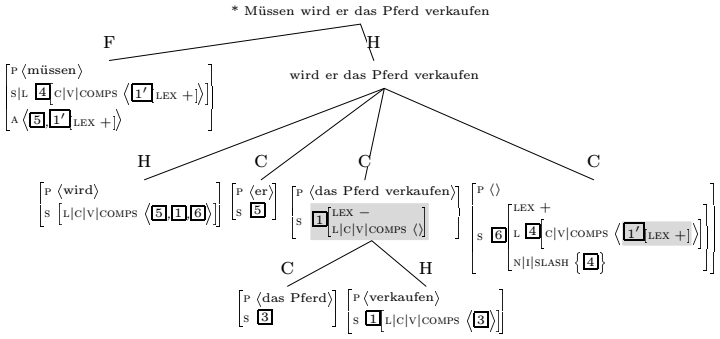

Figure 18. Topicalizing a verb without its verbal complement (I)

topicalized *müssen*, realizes its own complement *das Pferd* (3) in a head-complement structure, and the finite verb *wird* raises the resulting VP from its verbal complement (6). The conflict here arises because the VP *das Pferd verkaufen* (1) is [LEX −], as required by the head-complement schema, but the obligatorily coherent verb *müssen* requires its verbal complement (1′) to be [LEX +].

In the second tree in Figure 19, a similar conflict arises as in the tree in figure 17: To obtain the totally flat *Mittelfeld* the verb *wird* has to raise all complements (3, 1′) from its verbal argument (6). These complements have to be [LEX −] due to the argument-raising principle. But the verb *verkaufen* (1) is [LEX +], as required by its governor *müssen*.

The third possibility, the tree in figure 20, is that the embedded verb *verkaufen* and its governor, the trace of *müssen*, form a verbal cluster. The conflict here arises because the trace of *müssen* is the head of this verbal cluster. This conflicts with a standard restriction on unbounded

is a subject-raising verb. It thus raises the subject 5 of (the trace of) its verbal complement *das Pferd müssen* and represents it on its COMPS list, where finite verbs represent their subjects as discussed in connection with Figure 11.

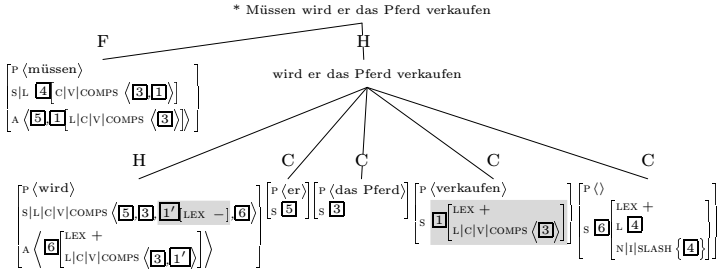

Figure 19. Topicalizing a verb without its verbal complement (II)

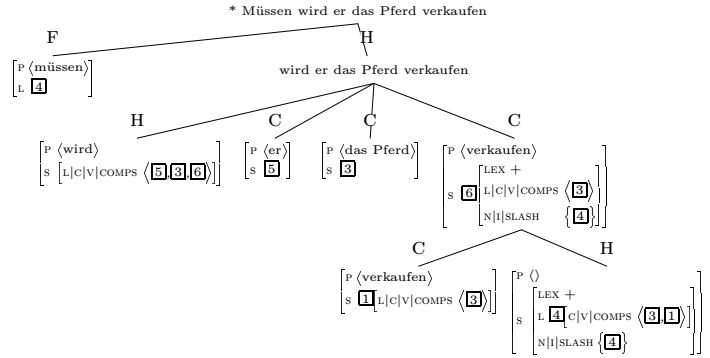

Figure 20. Topicalizing a verb without its verbal complement (III)

dependencies, the Trace Principle of Pollard and Sag (1994), which states that traces have to be subcategorized for.[28]

As an alternative to the LEX encoding of coherence requirements, one might be tempted to rule out examples like (58) by making reference to valence specifications alone, e.g., by stating that only saturated arguments can be raised. However, examples like (58) are also ungrammatical if the embedded verb which is left in the *Mittelfeld* is an intransitive verb, as the examples in (59) show.

[28] Under a traceless analysis, such as Pollard and Sag (1994, ch. 9) or Bouma et al. (2001), this restriction follows automatically since gaps in traceless approaches are lexically introduced with respect to the valence list of a head word, so that extracting the head itself is impossible.

(59) a. * [Müssen] wird er *lachen*.
have to will he laugh
He will have to laugh.

b. * [Müssen] wird *getanzt werden*.
have to will danced be
There will have to be dancing.

Under our theory with the LEX encoding, the most promising structure for example (59a) is the one shown in Figure 21. Just like in

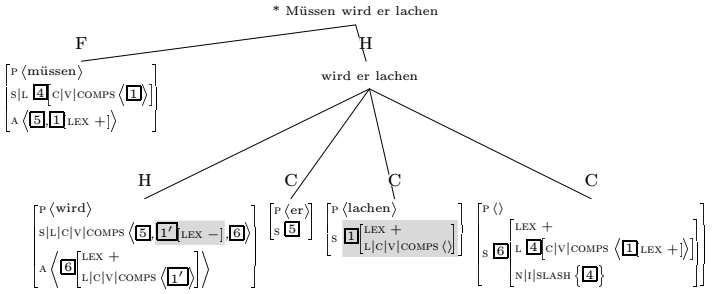

Figure 21. Topicalizing a verb without its intransitive verbal complement

the transitive verb case discussed above, the explanation building on the LEX requirement as coherence encoding is sufficient to explain the ungrammaticality of this structure: the coherently constructing verb *müssen* requires its verbal complement *lachen* (1) to be [LEX +]. To obtain the flat *Mittelfeld*, the verb *wird*, on the other hand, has to raise the verbal complement (1′) from its verbal argument (6). The argument-raising principle requires this complement (1′) to be [LEX −], which conflicts with the LEX value of the occurrence of *lachen* (1) in the tree.

Sentence (59b) is an example of a subjectless construction. Because the embedded verb *getanzt* is intransitive, there are no NP complements at all in the whole clause. But since our explanation of the ungrammaticality is independent of the valence specifications, this sentences is ruled out by the theory just like the previous one.

5.2. *Interaction of Partial Constituents with VP Topicalization*

5.2.1. *Partial APs and VP Topicalization*

The next analysis we want to show in detail is an example for a VP topicalization including a partial AP, namely the example (46b) discussed in section 3.4, repeated as (60) below.

(60) [Stolz gewesen] ist er *auf seine Kinder*.
proud been is he of his children
He was proud of his children.

In this example, argument raising from an adjectival complement has to interact with argument raising from a topicalized verbal complement in which it is embedded. The structure for this example as licensed by our theory is shown in Figure 22.

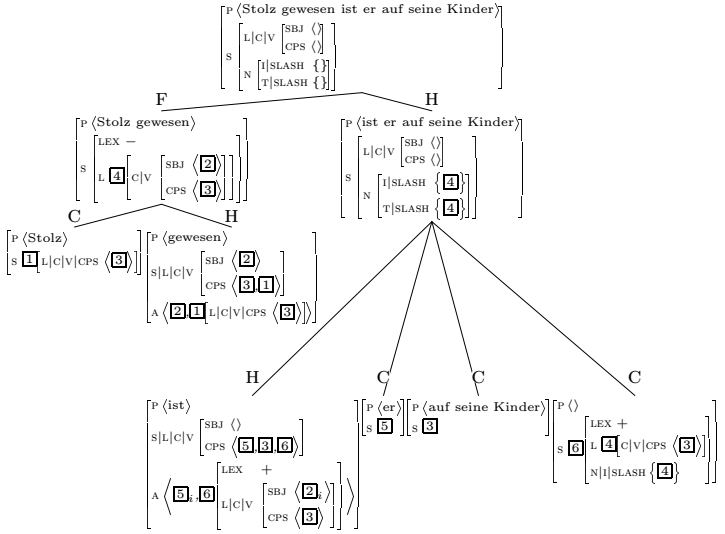

Figure 22. Topicalization of a VP including a partial AP

The important detail is how the topicalized constituent *stolz gewesen* with its partial AP is licensed. Just like in the example shown in Figure 14, the lexical entry of the copula *sein* shown in Figure 4 comes into play. The occurrence of the past participle of *sein*, *gewesen*, in the tree in figure 22 raises the argument *auf seine Kinder* (3) from its adjectival complement *stolz* (1). The remaining partial complement is then realized in a head-complement structure. The resulting VP *stolz gewesen* has one element left on its COMPS list, the raised PP *auf seine Kinder* (3). Note that this fronted VP can be licensed only by the head-complement schema and not by the cluster formation schema since the filler daughter in a head-filler structure is required to be [LEX −]. The fronted VP is thus analyzed parallel to fronted VP complements such as [*eine Vase schenken*], as we saw in (56). This means that the analysis of

the fronted constituent *stolz gewesen* differs from that of an occurrence which is not fronted, as in the example (40). In such an example *stolz gewesen* has to form a lexical cluster licensed by the cluster-formation schema in order to be selectable by the obligatorily coherent verb *ist* for which we saw the lexical entry in Figure 3.

Of course, the same tense auxiliary *ist* also occurs in the sentence in Figure 22 and requires its complement to be [LEX +]. But since the LEX requirement is not mediated by a long-distance dependency, as motivated empirically by the examples in section 3.1.2 and discussed theoretically at the end of section 4.2, the trace of the topicalized constituent *stolz gewesen* can be [LEX +] whereas the topicalized constituent itself is [LEX −].

Returning to the propagation of valence requirements in the tree in Figure 22, the argument-raising principle ensures that the occurrence of *ist* raises the PP *auf seine Kinder* (3) from (the trace of) its verbal complement *stolz gewesen* (6). Having raised the PP *auf seine Kinder* (3) to the COMPS requirements of *ist*, one can license a flat head-complement structure with *ist* as head daughter and the NP *er*, the trace of the fronted VP, and the raised PP as complement daughters. The PP *auf seine Kinder* has thus been raised twice and is realized independent from its original head *stolz*, as a complement of the verb *ist*.

5.2.2. *Partial NPs embedded in topicalized VPs*

We now take a closer look at the two examples for an interaction of partial NPs with VP topicalization which we discussed in section 3.4. The observation was that topicalization including a partial NP is possible (61a) whereas topicalization of the VP including only the PP argument of an NP is ungrammatical (61b).

(61) a. [Ein dickes Buch ausleihen] will niemand *darüber*.
a thick book borrow wants-to nobody on-this
Nobody wants to borrow a thick book on this topic.

b. * [Darüber ausleihen] will niemand *ein dickes Buch*.
on-this borrow wants-to nobody a thick book

The structure for the grammatical example (46c) is shown in Figure 23. We first focus on how the partial topicalized constituent *ein dickes Buch ausleihen* is licensed. The structure of the NP *ein dickes Buch* is licensed by the Head-Specifier and the Head-Adjunct Schema. Relevant for the following is that the PP complement (3) of the noun *Buch* is never saturated and thus appears on the COMPS list of the NP (1). As the lexical entry of the verb *ausleihen* shown in figure 5 interacts with the argument-raising principle of Figure 6, the occurrence of *ausleihen*

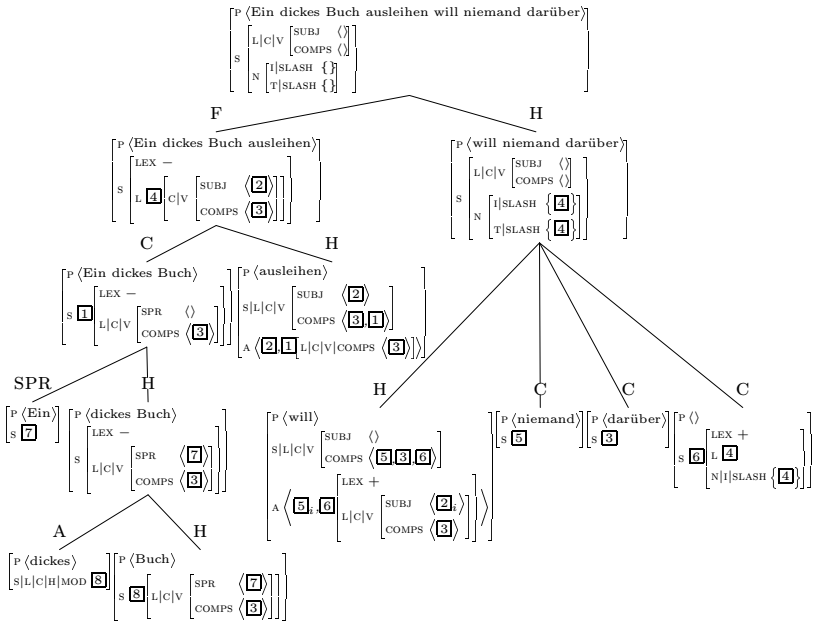

Figure 23. Topicalization of a VP including a partial NP

in the tree in figure 23 raises the PP argument *darüber* (3) from its nominal complement (1). The remaining partial-NP complement *ein dickes Buch* (1) is then realized in a head-complement structure. The resulting VP *ein dickes Buch ausleihen* is [LEX −] and has one element left on its COMPS list, the raised PP *darüber* (3).

The verb *will* belongs to the obligatorily coherent verbs and requires its verbal complement to be [LEX +], as was shown in its lexical entry in Figure 3. The argument-raising principle ensures that the occurrence of *will* in the tree in Figure 23 raises the PP *darüber* (3) from (the trace of) its verbal complement *ein dickes Buch ausleihen* (6). Again, as in the tree of figure 22, for this to be possible, the trace must be [LEX +], which does not conflict with the [LEX −] specification on the topicalized VP. The subject NP *niemand*, the raised PP *darüber*, and the trace of the partial-VP complement are then all realized in a flat head-complement structure. Parallel to the first interaction example discussed above, the PP (3) has thus been raised twice and is realized separate from its original head *Buch*, as a complement of the verb *will*.

The ungrammatical example (61b) involves a PP argument that has been topicalized with the VP, leaving the NP behind. The most promising structure for this example is shown in Figure 24. The example is

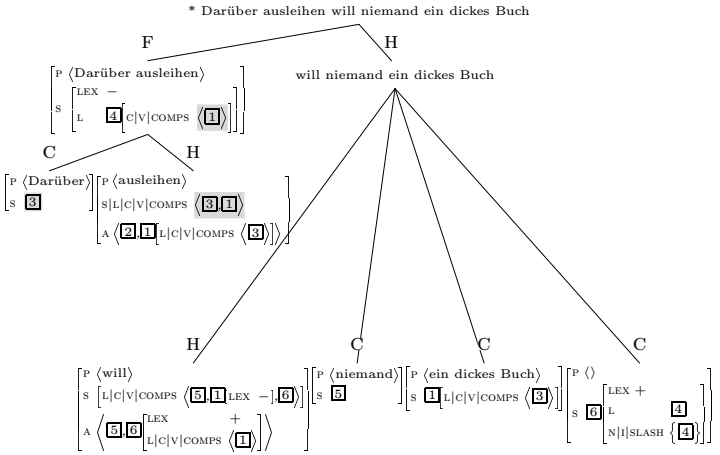

Figure 24. Topicalization of a VP including a raised PP

interesting since in the *Mittelfeld* both the NP and the PP can appear separately. This is reflected in our theory by allowing the PP to raise and become a sister of the NP. So why is example (61b) ungrammatical?

The conflict in this example arises in the topicalized constituent: The verb *ausleihen* in the example in figure 24 can raise the PP argument *darüber* (3) of the NP *ein dickes Buch* (1). To build the topicalized constituent *darüber ausleihen*, the raised PP has to be realized in a head-complement structure before its governor *Buch* is realized. But according to the Valence Principle shown in Figure 13, more oblique complements have to be realized first. The argument-raising principle defined in Figure 6 adds the raised complements to the beginning of the COMPS list, i.e., as less oblique than the other complements. One of these complements is the raising source, which therefore has to be realized before (or together with) any of the arguments raised from it. As a result, the head-complement structure *darüber ausleihen* cannot be licensed by our theory.

5.3. *Scrambling*

While our discussions of analyses so far focused on topicalization examples, our theory also provides an explanation for the patterns of grammaticality arising with (partial) VP and AP complements in the *Mittelfeld* which we discussed in sections 3.1 and 3.2.

5.3.1. *Complete complements*

Scrambling of full VP complements is possible when selected by incoherently constructing verbs, as illustrated again in (62).

(62) a. Er wird [das Pferd zu verkaufen] noch heute versuchen.
he will the horse to sell still today try

b. Er wird [das Pferd zu verkaufen] ihr noch heute empfehlen.
he will the horse to sell her still today advise

Our theory correctly predicts this since incoherently constructing verbs select a [LEX −] constituent. The argument-raising principle only raises complements from [LEX +] constituents. Complements of incoherently constructing verbs thus have to be full VPs, which like other saturated complements can occur in different positions of the *Mittelfeld*.[29]

Scrambling of full VP complements of coherently constructing verbs, as displayed again in example (63), is correctly predicted not to be possible since our theory does not license full VP complements of coherently constructing verbs in the *Mittelfeld* at all.

(63) * Er wird [das Pferd verkaufen] noch heute wollen.
he will the horse sell still today want to

This follows from the interaction of the argument-raising principle and the [LEX +] requirement which coherently constructing verbs impose on their complement. This explanation also covers the AP complements in (64), which are selected in the same way.

(64) * Er ist [stolz auf seine Kinder] im letzten Jahr gewesen.
he is proud of his children in the last year been

5.3.2. *Partial complements*

Examples (65) and (66) remind us that partial verbal and adjectival complements can never occur at the beginning of the *Mittelfeld*.

(65) * Er scheint / versucht / hofft [zu verkaufen] *das Pferd*.
he seems tries hopes to sell the horse

He seems to / tries to / hopes to sell the horse.

[29] A theory further restricting German *Mittelfeld* word order naturally is needed but is a topic of its own outside the scope of this paper.

(66) * Er ist [stolz] im letzten Jahr *auf seine Kinder* gewesen.
he is proud in the last year of his children been
Last year he was proud of his children.

For incoherently selected verbal complements, this follows from the fact that, as explained above, our theory never licenses partial verbal complements for incoherently constructing verbal heads.

Coherently selected verbal and adjectival complements combine with their verbal head as part of a head cluster. Unlike ordinary complements, these [LEX +] complements are licensed by the binary Head-Cluster Schema. In the tradition of Gazdar et al. (1985) and Pollard and Sag (1987, 1994) which we build on, linearization statements only order daughters in a local tree, so linearization of head cluster elements into the *Mittelfeld* is ruled out.[30] To ensure the proper order of the head-cluster (or a single [LEX +] element) to the right of all other elements in the flat head-complement structure, it suffices to specify the simple linear precedence statement shown in Figure 25.

$$[\textsc{synsem}|\textsc{lex}\ -] < [\textsc{synsem}|\textsc{lex}\ +]$$

Figure 25. Linearization according to lexical status

6. Outlook

We have tried to include a wide range of data in the discussion of the previous sections. There are, however, a number of topics which are relevant to an investigation of partial constituent fronting that were not included. In the following, we turn to some of these loose ends.

6.1. *Can adjectival heads take partial complements?*

The lexical argument-raising principle we defined in section 4.1.1 as the core of our analysis of partial constituents licenses partial complements of verbal heads. Partial VP and AP complements are licensed only for coherently constructing verbal heads. Askedal (1989, p. 103) argues on the basis of examples like (67) that adjectival heads can select coherently as well.

[30] For a discussion of linearization statements and a more far-reaching use of linearization in HPSG, the reader is referred to Reape (1996), Richter and Sailer (1995), Kathol (1995) and S. Müller (1999).

(67) da man Eiweiß auf Gift nicht mehr zu
because one$_{N'}$ white of egg$_{A''}$ on poison$_{P''}$ not$_{Neg'}$ anymore to
reimen gewohnt war. (from Thomas Mann's *Der Zauberberg*)
rhyme$_{V''}$ used to was$_{V'}$
Because one was no longer used to rhyme white of egg with poison.

The negation *nicht* is interpreted as belonging to the outer predicate *gewohnt sein*. But it intervenes between the inner predicate *zu reimen* and its complements *Eiweiß* and *auf Gift*. The possibility of performing such permutations of elements belonging to different heads is one of the tests of Bech (1955) for coherence.

On the other hand, the examples in (68) show that the full VP complement of the adjective can be fronted in the *Mittelfeld* (68a) and it can also be pied-piped (68b), which are two tests for an incoherent construction.

(68) a. da Eiweiß auf Gift zu reimen man
because white of egg$_{A''}$ on poison$_{P''}$ to rhyme$_{V''}$ one$_{N'}$
nicht$_{Neg'}$ mehr gewohnt war.
not anymore used to was$_{V'}$

b. das ist die Substanz, die auf Gift zu reimen
this is the substance which$_{A''}$ on poison$_{P''}$ to rhyme$_{V''}$
man nicht mehr gewohnt war.
one$_{N'}$ not$_{Neg'}$ anymore used to was$_{V'}$

The adjective *gewohnt* thus seem to pattern with optionally coherent verbs. More research is needed to determine which adjectives fall into this category. On the basis of such a classification, our lexical argument-raising principle could then be extended to also apply to the appropriate class of adjectives in order to license partial arguments of such adjectival heads.

6.2. *Can prepositional heads take partial complements?*

The question whether other categories permit raising of their arguments is also addressed by S. Müller (1999, pp. 202f). He provides example (69), in which a PP occurs separate from an NP which is embedded in a PP.[31]

[31] See also Lötscher (1985) for a related example.

(69) *Mit Norwegen* befinden wir uns allerdings [in [einem
with Norway are we ourselves however in a
langfristigen Stellungskrieg]].
long-term positional war
We are, however, engaged in a long-term positional war with Norway.

Müller assumes that the fronted PP *mit Norwegen* in (69) originates from within the PP *in einem langfristigen Stellungskrieg*. The sentence under Müller's view thus contains a fronted PP which originates from an NP that is embedded by the preposition *in*. Based on this assumption, Müller argues that in order for our argument raising approach to license such partial constituents, one would have to propose that the prepositional head *in* raises the embedded PP complement *mit Norwegen* from the noun *Stellungskrieg* onto its own COMPS list. The verb *befinden* could then raise the PP further to allow for it to be extracted as an argument of the verb. In such a setup, the preposition *in* would have two elements on its COMPS list, the NP complement and the raised PP—an assumption which Müller rejects as implausible since there is no independent empirical evidence for assuming that prepositions with such subcategorization requirements exist in German. He concludes that such examples should not be licensed by allowing a preposition to raise the PP argument of its nominal complement but by extracting the PP from the embedded nominal complement.

We believe that the initial assumption on which this argumentation builds is incorrect. The fronted PP in (69) does not originate from the NP as assumed by Müller. Instead, it is an argument of the main verb *befinden*. The PP is part of the idiomatic expression *sich mit jemandem im Krieg befinden* (to be at war with somebody) in which the verb *sich befinden* selects two PPs, one headed by *im* and one headed by *mit*. The sentence (69) thus only shows that one can front the PP complement of a verb. No partial NPs or PPs are involved and no argument raising by prepositional heads needs to be assumed. A discussion of further related examples is provided in De Kuthy (2000, pp. 13ff).

6.3. *Subjects in fronted constituents*

In our discussion of partial VP fronting, we implicitly assumed a VP to include the verbal head and its complements, not the subject. It was, however, noted by Haider (1982, 1990) that under certain conditions it is possible to realize a subject as part of a fronted, non-finite constituent. While this option is generally available for ergative subjects (70), the occurrence of unergative subjects is significantly more restricted but nonetheless possible, as shown by Haider's example (71).

(70) [Ein Fehler unterlaufen] ist ihr noch nie.
an error crept-in is her still never.
So far she has never made a mistake.

(71) [Ein Außenseiter gewonnen] hat hier noch nie.
an outsider won has here still never
An outsider has never won here yet.

At least two questions arise from this observation: First, how does the subject included in the fronted non-finite verbal constituent receive nominative case? And second, under what conditions can subjects be included in fronted non-finite verbal constituents? In Meurers (1999c), an answer to the first question is provided as a first step towards determining the various factors involved in the more general, second question.

6.4. *Lexical restrictions, context effects, and a non-syntactic explanation for supposed movement restrictions*

In this paper, we have focused on the different syntactic options for licensing the occurrence of partial constituents. In section 3.3, however, we have already mentioned that the occurrence of partial NPs is subject to lexical restrictions. It has, for example, often been observed that grammatical examples containing a partial NP like the ones presented in (72a) become ungrammatical when the embedding verb is replaced by a verb which has the same syntactic properties but a different semantics, as in (72b).

(72) a. *Über Syntax* hat er [ein Buch] **ausgeliehen**.
on syntax has he a book borrowed
He borrowed a book on syntax.

b. * *Über Syntax* hat er [ein Buch] **geklaut**.
on syntax has he a book stolen
He stole a book on syntax.

De Kuthy (2001) takes a closer look at the lexical semantic properties of this contrast and shows how the reanalysis-like HPSG approach to partial constituents we have presented in this paper can be extended to integrate such lexical restrictions.

Interestingly, as discussed by Fanselow (1991, pp. 184f) and De Kuthy (2000), the acceptability of examples ruled out by lexical restrictions can significantly be improved by adding an appropriate context. Thus, example (72b) is much improved if it occurs in the context of a discussion about different books that were stolen from the library, as shown in (73).

(73) Gestern wurde in der Bibliothek eine Anzahl von Linguistikbüchern geklaut. Vor allem Semantikbücher verschwanden dabei.

Yesterday, a number of linguistics books were stolen from the library. Mostly books on semantic disappeared.

a. *Über Syntax* wurde jedoch [nur ein einziges Buch]
on syntax was however only one single book
geklaut.
stolen

As an alternative approach to the lexical restrictions, De Kuthy (2000) provides an explanation for the differences in acceptability based on the focus-background structure of sentences. She shows that examples containing a partial NP as in (72) are acceptable only if not both the partial NP and the separate PP are part of the same focus projection or the background of the sentence. Sentence (72a), for example, is less acceptable in the context shown in (74) where both the fronted PP *über Syntax* and the partial NP *ein Buch* provide new information and are thus in the focus of the sentence.

(74) Gestern war Klaus seit langem mal wieder in der Bibliothek.

Yesterday, Klaus went to the library.

a. # *Über Syntax* hat er dort ein Buch ausgeliehen.

He borrowed a book on syntax there.

This observations has an interesting consequence with respect to the supposed restrictions on movement we discussed in section 2.1.1: The effects of specificity and specified subjects turn out to have a natural explanation under the focus-background structure account of partial NPs. The heterogeneous behavior of definite NPs we saw in section 2.1.1.2, for example, falls out of the fact that the definite determiners in these examples differ with respect to their integration into the discourse. In example (11), here repeated as (75), the definite NP *das Buch* has to be interpreted as referring to an entity already present in the discourse.

(75) a. * *Über Syntax* hat Karl [**das** Buch] gelesen.
on syntax has Karl the book read

Karl read the book on syntax.

b. ?? [**Das** Buch] hat Karl *über Syntax* gelesen.
the book has Karl on syntax read

Therefore, both the definite NP and its PP dependent have to be in the background of the sentence. According to De Kuthy's approach, the two sentences in (75) are thus unacceptable because the restriction

on the focus-background structure of sentences containing a partial NP is violated.

The two acceptable examples containing a partial NP with a definite determiner we saw in (12), here repeated as (76), are acceptable since the definite determiner in these examples is used in a different way, namely the definite NP *nur diese, aber nicht jene Bücher* is used deictically.

(76) a. *Von Handke* hat sie nur **diese**, aber nicht **jene** Bücher
by Handke has she only these but not those books
gelesen.
read

She only read these but not those books by Handke.

b. [Nur diese Bücher] hat sie *von Handke* gelesen.
only these books has she by Handke read

She only read these books by Handke.

Such definite NPs can therefore represent new information and can be in the focus of the sentence, in contrast to the anaphorically used NPs in (75). The PP *von Handke* in (76) can nevertheless provide old information, i.e., can be in the background of the sentence. The two examples in (76) are thus acceptable because the focus-background restriction on sentences containing a partial NP is met. The same explanation can be given for examples containing a partial NP with a prenominal genitive, i.e., a specified subject such as the ones we saw in (13) and (15).

The approach to partial constituents we have presented in this paper is integrated with an HPSG approach to information structure in De Kuthy (2000). In the resulting theory, sentences containing partial NPs are restricted to occur with an appropriate focus-background structure along the lines sketched above.

6.5. *Topicalization of adjuncts*

In our discussion of partial NPs in this paper, we were solely concerned with PP arguments. But, like verbs, nouns can be modified by a PP. This is illustrated by example (77), where the noun *Freundin* is modified by the PP *mit roten Haaren*.

(77) Peter hat eine neue Freundin mit roten Haaren.
Peter has a new girlfriend with red hair

Peter has a new, red-haired girlfriend.

It is generally stated in the literature that such adjunct PPs cannot occur separate from the noun they modify. The following ungrammat-

ical sentence, where an adjunct PP has been topicalized without the NP it modifies, exemplifies this.

(78) * *Mit roten Haaren* hat Peter [eine neue Freundin].
with red hair has Peter a new girlfriend

However, as discussed in De Kuthy (2001), there are grammatical examples in which an adjunct PP occurs separate from the NP it modifies. To support this claim, she provides the following two grammatical sentences from the *Frankfurter Rundschau*, a national German newspaper.

(79) a. *Aus dem 17. Jahrhundert* erklangen in dynamisch differenziertem Spiel [Tanzsätze von Johann Sebastian Bach].
from the 17th century sounded in dynamically differentiated manner dances by Johann Sebastian Bach
Bach

Some dances from the 17th century by Johann Sebastian Bach were played in a dynamically differentiated manner.

b. *Aus dem "English Theater"* stehen [zwei Modelle] in den Vitrinen.
of the English Theater are two models in the display

There are two models from the English Theater on display.

Note that the fronted PPs are clearly modifiers of the bracketed NPs since the interpretation of these PPs as adverbials does not make sense.

Just like for the partial constituents missing arguments discussed above, the context also plays an important role for the cases involving adjuncts. Example (80) illustrates that a sentence like the one that was judged ungrammatical in (78) is in fact grammatical when accompanied by the right kind of context.

(80) Auf einer Show in Köln wurde die neueste Frisurmode vorgestellt.

a. *Mit kurzen Haaren* wurden dabei nur [drei Modelle] gezeigt.
with short hair were there only three models
presented

The newest haircuts were presented during a show in Köln. Only three of the models shown had short hair.

In De Kuthy and Meurers (1999a, 2000) we show that the argument-raising account developed in this paper can be combined with an adjuncts-as-dependents approach along the lines of Bouma et al. (2001) to account for such data involving adjuncts. Extending this approach further, the context effects are addressed in De Kuthy (2000).

7. Summary

Investigating the nature of partial fronting phenomena in German, we contrasted two approaches: the remnant-movement analysis and a reanalysis-like approach. We showed that the empirical arguments discussed in the literature for preferring remnant movement are not convincing and that certain word order phenomena support a reanalysis-like approach to partial constituents.

We then compared three different kinds of partially occurring complements: verbal, adjectival, and nominal ones. We discussed the different behavior of coherently and incoherently selected verbal complements and showed that adjectival complements behave parallel to the coherently selected verbal complements. Nominal complements, on the other hand, were shown not to be subject to the restrictions holding for the verbal or adjectival complements.

We captured the empirical insights in a reanalysis-like theory formalized in the HPSG paradigm. The argument-raising mechanism gives a formally precise rendering to a notion of reanalysis. The theory presented extends the empirical coverage of previous HPSG proposals in a way which accounts for the similarities and the differences between three different kinds of partial constituents. The similarities derive from a generalization of the argument-raising approach to partial VPs: a lexical principle which introduces argument raising as a general possibility for verbal heads. The differences result from the different requirements with respect to the lexicality (LEX) of the complements as specified in the lexical entries and a relation (*raised*) parameterizing the lexical principle. As additional support for the analysis, we showed that the approach predicts the observable interaction of (partial) VP topicalization with embedded partial NPs or APs.

References

Abeillé, A. and D. Godard, 1999, 'French Word Order and Lexical Weight', in R. D. Borsley (ed.), *The Nature and Function of Syntactic Categories*, Vol. 32 of *Syntax and Semantics*, Academic Press, New York, pp. 325–360.

Abeillé, A., D. Godard, and I. A. Sag, 1998, 'Two Kinds of Composition in French Complex Predicates', in E. W. Hinrichs, A. Kathol, and T. Nakazawa (eds.), *Complex Predicates in Non-derivational Syntax*, Vol. 30 of *Syntax and Semantics*, Academic Press, New York, pp. 1–41.

Askedal, J. O., 1983, 'Kohärenz und Inkohärenz in Deutschen Infinitfügungen: Vorschlag zur begrifflichen Klärung', *Lingua* **59**, 177–196.

Askedal, J. O., 1989, 'Über den Infinitiv ohne bzw. mit "zu" im heutigen Deutsch: Klassenbildung regierender Lexeme und Hauptzüge der Distribution (II)', *Deutsch als Fremdsprache* **26**(2), 103–106.

Bach, E. and G. Horn, 1976, 'Remarks on "Conditions on Transformations"', *Linguistic Inquiry* **7**, 265–299.

Bech, G., 1955, *Studien über das deutsche verbum infinitum*, Historisk-filologiske Meddelelser udgivet af Det Kongelige Danske Videnskabernes Selskab, Bind 35, no. 2, 1955; Bind 36, no. 6, 1957; Kopenhagen, reprinted 1983 as No. 139 in Linguistische Arbeiten, Max Niemeyer, Tübingen.

Bouma, G., R. Malouf, and I. A. Sag, 2001, 'Satisfying Constraints on Extraction and Adjunction', *Natural Language and Linguistic Theory* **19**(1), 1–65.

Bouma, G. and G. van Noord, 1998, 'Word Order Constraints on Verb Clusters in German and Dutch', in E. W. Hinrichs, A. Kathol, and T. Nakazawa (eds.), *Complex Predicates in Non-derivational Syntax*, Vol. 30 of *Syntax and Semantics*, Academic Press, New York, pp. 43–72.

Chomsky, N., 1973, 'Conditions on Transformations', in S. Anderson and P. Kiparsky (eds.), *A Festschrift for Morris Halle*, Holt, Rinehart and Winston, New York, pp. 232–286.

Chomsky, N., 1977, 'On Wh-Movement', in P. Culicover, T. Wasow, and A. Akmajian (eds.), *Formal Syntax*, Academic Press, New York, pp. 71–132.

Chomsky, N., 1981, *Lectures on Government and Binding*, Foris, Dordrecht.

Chomsky, N., 1986, *Barriers*, MIT Press, Cambridge.

Davis, A., 1996, 'Lexical Semantics and Linking in the Hierarchical Lexicon', Ph.D. dissertation, Stanford University.

De Kuthy, K., 2000, 'Discontinuous NPs in German — A Case Study of the Interaction of Syntax, Semantics and Pragmatics', Phil. Diss., Universität des Saarlandes, Saarbrücken.

De Kuthy, K., 2001, 'Splitting PPs from NPs', in W. D. Meurers and T. Kiss (eds.), *Constraint-Based Approaches to Germanic Syntax*, Studies in Constraint-Based Lexicalism, CSLI Publications, Stanford.

De Kuthy, K. and W. D. Meurers, 1998a, 'Incomplete Category Fronting in German without Remnant Movement', in B. Schröder, W. Lenders, W. Hess, and T. Portele (eds.), *Computers, Linguistics, and Phonetics between Language and Speech (Proceedings of the 4th Conference on Natural Language Processing, KONVENS 98)*, Vol. 1 of *Computer Studies in Language and Speech*, Peter Lang, Frankfurt a.M., pp. 57–68.

De Kuthy, K. and W. D. Meurers, 1998b, 'Towards a General Theory of Partial Constituent Fronting in German', in G. Bouma, G.-J. Kruijff, and R. Oehrle (eds.), *Proceedings of the Joint Conference on Formal Grammar, Head-driven Phrase Structure Grammar, and Categorial Grammar (FHCG-98)*, Saarbrücken, pp. 113–124.

De Kuthy, K. and W. D. Meurers, 1999a, 'Argument Raising Meets Adjuncts-as-Dependents and Traceless Extraction', in *Proceedings of the Sixth International Conference on HPSG*, Edinburgh, pp. 45–50.

De Kuthy, K. and W. D. Meurers, 1999b, 'On Partial Constituent Fronting in German', in V. Kordoni (ed.), *Tübingen Studies in Head-Driven Phrase Structure Grammar*, No. 132 in Arbeitspapiere des SFB 340, Sonderforschungsbereich 340, Universität Tübingen, Tübingen, pp. 22–73.

De Kuthy, K. and W. D. Meurers, 2000, 'From Argument Raising to Dependent Raising', in R. Cann, C. Grover, and P. Miller (eds.), *Grammatical Interfaces in HPSG*, Studies in Constraint-Based Lexicalism, CSLI Publications, Stanford.

Evers, A., 1975, 'The Transformational Cycle in Dutch and German', Ph.D. dissertation, University of Utrecht.

Fanselow, G., 1987, *Konfigurationalität*, Gunter Narr, Tübingen.

Fanselow, G., 1991, 'Minimale Syntax', *Groninger Arbeiten zur Germanistischen Linguistik (GAGL)* **32**, 1–402.

Fiengo, R. and J. Higginbotham, 1981, 'Opacity in NP', *Linguistic Analysis* **7**(4), 395–421.

Fortmann, C., 1996, *Konstituentenbewegung in der DP-Struktur*, No. 347 in Linguistische Arbeiten, Max Niemeyer, Tübingen.

Gazdar, G., E. Klein, G. K. Pullum, and I. A. Sag, 1985, *Generalized Phrase Structure Grammar*, Harvard University Press, Cambridge.

Geach, P. T., 1970, 'A Program for Syntax', *Synthese* **22**, 483–497.

Grewendorf, G., 1989, *Ergativity in German*, No. 35 in Studies in Generative Grammar, Foris, Dordrecht.

Haegeman, L. and H. van Riemsdijk, 1986, 'Verb Projection Raising, Scope, and the Typology of Verb Movement Rules', *Linguistic Inquiry* **17**, 417–466.

Haider, H., 1982, 'Dependenzen und Konfigurationen: Zur deutschen V-Projektion', *Groninger Arbeiten zur Germanistischen Linguistik (GAGL)* **21**, 1–59.

Haider, H., 1990, 'Topicalization and Other Puzzles of German Syntax', in G. Grewendorf and W. Sternefeld (eds.), *Scrambling and Barriers*, John Benjamins, Amsterdam, pp. 93–112.

Haider, H., 1993, *Deutsche Syntax — generativ. Vorstudien zu einer projektiven Grammatik*, Gunter Narr, Tübingen.

Hinrichs, E. and T. Nakazawa, 1994a, 'Linearizing AUXs in German Verbal Complexes', in J. Nerbonne, K. Netter, and C. Pollard (eds.), *German in Head-Driven Phrase Structure Grammar*, No. 46 in CSLI Lecture Notes, CSLI Publications, Stanford, pp. 11–37.

Hinrichs, E. and T. Nakazawa, 1994b, 'Partial-VP and Split-NP Topicalization in German - An HPSG Analysis', in E. W. Hinrichs, W. D. Meurers, and T. Nakazawa (eds.), *Partial-VP and Split-NP Topicalization in German – An HPSG Analysis and its Implementation*, No. 58 in Arbeitspapiere des SFB 340, Sonderforschungsbereich 340, Universität Tübingen, Tübingen, pp. 1–46.

Hinrichs, E. W. and T. Nakazawa, 1989, 'Flipped Out: Aux in German', in *Papers from the 25th Regional Meeting of the Chicago Linguistic Society*, Chicago, pp. 193–202.

Höhle, T. N., 1986, 'Der Begriff "Mittelfeld", Anmerkungen über die Theorie der topologischen Felder', in A. Schöne (ed.), *Kontroversen alte und neue. Akten des VII. Internationalen Germanistenkongresses Göttingen 1985*, Max Niemeyer, Tübingen, pp. 329–340.

Horn, G. M., 1975, 'The Noun Phrase Constraint', Ph.D. dissertation, University of Massachusetts, Amherst.

Jackendoff, R., 1977, *X-bar Syntax: A Study of Phrase Structure*, MIT Press, Cambridge.

Johnson, M., 1986, 'A GPSG Account of VP Structure in German', *Linguistics* **24**, 871–882.

Kathol, A., 1995, 'Linearization-Based German Syntax', Ph.D. dissertation, Ohio State University, Columbus.

Kathol, A., 1998, 'Constituency and Linearization of Verbal Complexes', in E. W. Hinrichs, A. Kathol, and T. Nakazawa (eds.), *Complex Predicates in Non-derivational Syntax*, Vol. 30 of *Syntax and Semantics*, Academic Press, New York, pp. 221–270.

Kiss, T., 1995, *Infinitive Komplementation*, No. 333 in Linguistische Arbeiten, Max Niemeyer, Tübingen, published version of Phil. Diss., Bergische Universität – Gesamthochschule Wuppertal, 1992.

Kolb, H.-P. and C. Thiersch, 1991, 'Levels and Empty Categories in a Principles and Parameters Approach to Parsing', in H. Haider and K. Netter (eds.), *Representation and Derivation in the Theory of Grammar*, Vol. 22 of *Studies in Natural Language and Linguistic Theory*, Kluwer, Dordrecht, pp. 251–301.

Kordoni, E., 2000, 'Lexical Semantics and Linking in the Hierarchical Lexicon: The Case of Psych-Verb Constructions', Ph.D. dissertation, University of Essex, Colchester.

Krieger, H.-U. and J. Nerbonne, 1993, 'Feature-Based Inheritance Networks for Computational Lexicons', in T. Briscoe, A. Copestake, and V. De Paiva (eds.), *Inheritance, Defaults and the Lexicon*, Cambridge University Press, Cambridge, pp. 90–136, Also published as Report RR-91–31, DFKI, Saarbrücken.

Kuno, S., 1987, *Functional Syntax*, University of Chicago Press, Chicago.

Lötscher, A., 1985, 'Syntaktische Bedingungen der Topikalisierung', *Deutsche Sprache* **13**, 207–229.

Mahajan, A., 1992, 'The Specificity Condition and the CED', *Linguistic Inquiry* **23**, 510–516.

Meurers, W. D., 1997a, 'Statusrektion und Wortstellung in kohärenten Infinitkonstruktionen des Deutschen', in E. Hinrichs, W. D. Meurers, F. Richter, M. Sailer, and H. Winhart (eds.), *Ein HPSG-Fragment des Deutschen. Teil 1: Theorie*, No. 95 in Arbeitspapiere des SFB 340, Sonderforschungsbereich 340, Universität Tübingen, Tübingen, pp. 189–248.

Meurers, W. D., 1997b, 'Using Lexical Principles in HPSG to Generalize Over Valence Properties', in G.-J. M. Kruijff, G. V. Morrill, and R. T. Oehrle (eds.), *Proceedings of the Third Conference on Formal Grammar*, Aix-en-Provence, pp. 137–146.

Meurers, W. D., 1999a, 'German Partial-VP Topicalization Revisited', in G. Webelhuth, J.-P. Koenig, and A. Kathol (eds.), *Lexical and Constructional Aspects of Linguistic Explanation*, Studies in Constraint-Based Lexicalism, CSLI Publications, Stanford, pp. 129–144, published version of a paper presented at the 3rd International Conference on HPSG, May 1996, Marseille.

Meurers, W. D., 1999b, 'Lexical Generalizations in the Syntax of German Non-Finite Constructions', Phil. diss., Universität Tübingen, available in 2000 as No. 145 in Arbeitspapiere des SFB 340, Sonderforschungsbereich 340, Universität Tübingen, Tübingen.

Meurers, W. D., 1999c, 'Raising Spirits (and Assigning Them Case)', *Groninger Arbeiten zur Germanistischen Linguistik (GAGL)* **43**, 173–226.

Müller, G., 1991, 'Abstrakte Inkorporation', in S. Olsen and G. Fanselow (eds.), *DET, COMP and INFL*, Max Niemeyer, Tübingen, pp. 155–202.

Müller, G., 1993, 'On Deriving Movement Type Assymetries', Phil. diss., Universität Tübingen, available as SfS-Report 05-93.

Müller, G., 1996, 'Incomplete Category Fronting', Habilitationsschrift, Universität Tübingen, available as SfS-Report 01-96.

Müller, G. and W. Sternefeld, 1995, 'Extraction, Lexical Variation, and the Theory of Barriers', in U. Egli, P. E. Pause, C. Schwarze, A. v. Stechow, and G. Wienold (eds.), *Lexical Knowledge in the Organization of Language*, Vol. 114 of *Current Issues in Linguistic Theory*, John Benjamins, Amsterdam, pp. 35–80.

Müller, S., 1997, 'Yet Another Paper about Partial Verb Phrase Fronting in German', Research Report RR–97–07, DFKI, Saarbrücken, a shorter version appeared in *Proceedings of the 16th Conference on Computational Linguistics (COLING-96)* pp. 800–805.

Müller, S., 1999, *Deutsche Syntax deklarativ, Head-Driven Phrase Structure Grammar für das Deutsche*, No. 394 in Linguistische Arbeiten, Max Niemeyer, Tübingen.

Nerbonne, J., 1994, 'Partial Verb Phrases and Spurious Ambiguities', in J. Nerbonne, K. Netter, and C. Pollard (eds.), *German in Head-Driven Phrase Structure Grammar*, No. 46 in CSLI Lecture Notes, CSLI Publications, Stanford, pp. 109–150.

Netter, K., 1996, 'Functional Categories in an HPSG for German', Phil. diss., Universität des Saarlandes, Saarbrücken, available as Volume 3 of Saarbrücken Dissertations in Computational Linguistics and Language Technology, 1998.

Pafel, J., 1993, 'Ein Überblick über die Extraktion aus Nominalphrasen im Deutschen', in F.-J. d'Avis, S. Beck, U. Lutz, J. Pafel, and S. Trissler (eds.), *Extraktion im Deutschen I*, No. 34 in Arbeitspapiere des SFB 340, Sonderforschungsbereich 340, Universität Tübingen, Tübingen, pp. 191–245.

Pollard, C., 1996, 'On Head Non-Movement', in H. Bunt and A. van Horck (eds.), *Discontinuous Constituency*, Vol. 6 of *Natural Language Processing*, Mouton de Gruyter, Berlin and New York, pp. 279–305, published version of ms. dated January 1990.

Pollard, C. and I. A. Sag, 1987, *Information-based Syntax and Semantics, Vol. 1: Fundamentals*, No. 13 in CSLI Lecture Notes, CSLI Publications, Stanford.

Pollard, C. and I. A. Sag, 1994, *Head-Driven Phrase Structure Grammar*, University of Chicago Press, Chicago.

Pustejovsky, J. D., 1985, 'Studies in Generalized Binding', Ph.D. dissertation, University of Massachusetts, Amherst.

Reape, M., 1996, 'Getting Things in Order', in H. Bunt and A. van Horck (eds.), *Discontinuous Constituency*, Vol. 6 of *Natural Language Processing*, Mouton de Gruyter, Berlin and New York, pp. 209–253, published version of ms. dated 1990.

Reis, M., 1980, 'On Justifying Topological Frames: "Positional Field" and the Order of Nonverbal Constituents in German', *DRLAV: Revue de Linguistique* **22/23**, 59–85.

Richter, F. and M. Sailer, 1995, 'Remarks on Linearization: Reflections on the Treatment of LP-Rules in HPSG in a Typed Feature Logic', Master's thesis, Seminar für Sprachwissenschaft, Universität Tübingen.

Ross, J. R., 1967, 'Constraints on Variables in Syntax', Ph.D. dissertation, MIT, Cambridge, appeared as Ross (1986): *Infinite Syntax*, Ablex, Norwood, New Jersey.

Stabler, E., 1999, 'Remnant Movement and Complexity', in G. Bouma, E. W. Hinrichs, G.-J. M. Kuijff, and R. T. Oehrle (eds.), *Constraints and Resources in Natural Language Syntax and Semantics*, Studies in Constraint-Based Lexicalism, CSLI Publications, Stanford, pp. 299–326.

Sternefeld, W., 1991, 'Chain Formation, Reanalysis, and the Economy of Levels', in H. Haider and K. Netter (eds.), *Derivation and Representation in the Theory of Grammar*, Kluwer, Dordrecht, pp. 75–143.

Thiersch, C., 1985, 'VP and Scrambling in the German Mittelfeld', ms., Universität Köln and University of Conneticut, Storrs, CT.

von Stechow, A., 1984, 'Gunnar Bech's Government and Binding Theory', *Linguistics* **22**, 225–241.

Webelhuth, G., 1992, *Principles and Parameters of Syntactic Saturation*, Oxford University Press, Oxford.

Webelhuth, G. and H. den Besten, 1987, 'Remnant Topicalization and the Constituent Structure of VP in the Germanic SOV Languages (abstract for the 10th GLOW Colloquium)', in H. Bennis and J. Koster (eds.), *GLOW Newsletter Nr. 18*, Foris Publications, Dordrecht, pp. 15–16.

Wechsler, S., 1995, *The Semantic Basis of Argument Structure*, Dissertations in Linguistics, CSLI Publications, Stanford.

Wexler, K. and P. Culicover, 1980, *Formal Principles of Language Acquisition*, MIT Press, Cambridge.

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