Chapter 1

Towards a General Theory of Partial Constituent Fronting in German

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1 The issue

The topicalization of partial constituents in German has received much attention in the literature since the phenomenon is a serious challenge to the theory of constituency. In the HPSG paradigm, the attention has focussed on the topicalization of partial verb phrases.[1] But G. Müller (1993, 1996) and others discussed 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

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

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

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.

Looking at the theoretical consequences drawn from such data, two ideas pursued in the principles and parameters paradigm are that i. the constructions involve remnant movement of a constituent containing a trace (Thiersch 1985, Webelhuth and den Besten 1987, G. Müller 1996), or ii. "smaller" constituents can be topicalized which are licensed with the help of special processes like "reanalysis" (Fanselow 1987, for partial NPs). Parallel

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[1]Pollard (1996), Hinrichs and Nakazawa (1994), Nerbonne (1994), Kathol (1995, sec. 7.7), Meurers (1998), St. Müller (1997), Bouma and van Noord (1998, sec. 3.4)

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to these two ideas, HPSG approaches to PVP topicalization proposed a remnant movement-like analysis (Hinrichs and Nakazawa 1994) or used an extended notion of valence, argument raising, which supports partial structures like those resulting from "reanalysis" (the other publications cited in fn. 1). Since 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, 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.

In this paper, we want to discuss and compare the partial constituents of the three different categories and develop an HPSG theory which accounts for the observable similarities and differences in the three sets of data. We show that a generalized argument raising account makes the correct predictions, in particular regarding the observable word order and the interaction in complex fronting phenomena involving topicalized (P)VPs with partial complements. With respect to the theoretical consequences of the partial fronting data, we believe that the reanalysis-like theory we propose provides a concrete basis for a reevaluation of the choice between remnant movement and reanalysis.

2 The data

2.1 Partial VPs

It is known since Bech (1955) that the possibility of partial VP topicalization depends on the class of the governing verb. Obligatorily coherent verbs like *werden* (will) in (1a) and optionally coherent verbs like *versuchen* (try) in (2a) allow PVP topicalization, while obligatorily incoherent ones as *empfehlen* (recommend) in (2b) do not.[2]

(2) a. [Zu verkaufen] versuchte er *das Pferd.*
to sell tried he the horse

b. * [Zu verkaufen] empfahl er ihr *das Pferd.*
to sell recommended he her the horse

The examples in (3) show that if a topicalized verbal head coherently selects a verbal complement, that complement has to be included in the fronted constituent.[3]

[2]A discussion of Bech's proposal in the context of HPSG is provided in Kiss (1992).

[3]Examples like the ones shown in (3) are a notorious problem case. For G. Müller (1993, p. 447, fn. 22) the ungrammaticality of a sentence like (3b) "can be made to follow from the general prohibition against predicate scrambling", but he never actually provides such a constraint explicitly. The restrictions proposed in Hinrichs and Nakazawa (1994) and Nerbonne (1994) are shown by Kathol (1995, pp. 260f.) to be too restrictive. Kathol and St. Müller (1997) then propose something similar to the generalization we state above; but see fn. 5 for a difference between the proposed formalizations.

(3) a. [Verkaufen$_3$ müssen$_2$] wird$_1$ er *das Pferd*.
sell have-to will he the horse

b. * [Müssen$_2$] wird$_1$ er *das Pferd verkaufen$_3$*.
have-to will he the horse sell

c. * [Das Pferd müssen$_2$] wird$_1$ er *verkaufen$_3$*.
the horse have-to will he sell

In HPSG, Pollard (1996) showed that the lexical argument raising specification of Hinrichs and Nakazawa (1989) can be employed to supply the variable subcategorization requirements required to license the full range of (partial) verbal constituents occurring as complements of coherently constructing verbs. Subsequently, a number of authors argued that the partial constituents should only be licensed in topicalized position (Hinrichs and Nakazawa 1994, Nerbonne 1994, Meurers 1998, St. Müller 1997), which was motivated by the theoretical desideratum of excluding spuriously ambiguous structures in the Mittelfeld.

Interestingly, one can actually find empirical support for excluding the spurious structures, which in the HPSG discussion on PVP topicalization has gone unnoticed. The examples in (4) show that the partial verbal constituent can never be linearized at the beginning of the Mittelfeld. Complete infinitival complements, on the other hand, can occur there when selected by obligatorily incoherent (5c) and optionally coherent verbs (5b), but not obligatorily coherent ones (5a).

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

b. * Er versuchte [zu verkaufen] *das Pferd* verzweifelt.
he tried to sell the horse desperately

c. * Er empfahl [zu verkaufen] ihr *das Pferd*.
he recommended to sell her the horse

(5) 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-to

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

In addition to being theoretically attractive, it thus is also empirically motivated to license partial verbal constituents for topicalization only, and we will assume such an approach as the background of our proposal.

2.2 Partial APs

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 now straightforwardly be characterized as behaving like the partial verbal complements of obligatorily coherent verbs (cf. G. Müller 1993, St. Müller 1997). Firstly, a partial AP can be topicalized as shown in (1c), and with a different kind of AP in (6).

(6) [Treu] will er *seiner Frau* für immer bleiben.
faithful wants-to he his wife for ever remain

Secondly, neither a partial (7a) nor a complete (7b) AP can be linearized at the beginning of the Mittelfeld.

(7) a. * Er ist [stolz] immer *auf seine Kinder* gewesen.
he is proud always of his children been

b. * Er ist [stolz auf seine Kinder] immer gewesen.
he is proud of his children always been

Finally, the complement of the AP can occur at the beginning of the Mittelfeld (8), just like the complement of the verbal argument of a coherently constructing verb (9).

(8) Er ist *auf seine Kinder* immer [stolz] gewesen.
he is on his children always proud been

(9) Noch heute wird *es* der Mann [verkaufen] wollen.
Still today will it the man sell want

All of these facts 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.

2.3 Partial NPs

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.

Such a nominal complement can be partially topicalized, as was shown in (1b), and the complete NP can be linearized at the beginning of the Mittelfeld as exemplified in (10).

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

Furthermore, the complement of the NP can be linearized at the beginning of the Mittelfeld (11).

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

But, different from all the other partial constituents discussed above, even a partial NP can occur at the beginning of the Mittelfeld (12).

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

The conclusion we want to draw from these facts is that a partial NP and its PP argument should be analyzed as two independent sister constituents. Thus, when a PP argument is raised from an NP, the remaining partial NP complement needs to be treated by its verbal head like any other saturated complement.

There are two related aspects which we have no space to discuss here: Firstly, the occurrence of partial NPs is subject to certain lexical restrictions. A discussion of these restrictions and how they can be integrated into our account is provided in De Kuthy (1998). That paper also situates the empirical phenomenon discussed here in the context of other phenomena involving partial NPs, such as the so-called Split NPs and *Was-für* Split. Secondly, G. Müller (1996) argued that there is empirical evidence for the existence of a trace in a partially fronted NP. In De Kuthy and Meurers (1998) we provide examples which show that his conclusion is not convincing.

2.4 Interactions

Interesting empirical evidence arises from the fact that the topicalization of (P)VPs can interact with the occurrence of partial APs and NPs. An example for a fronted VP including a partial NP is shown in (13a) and the parallel case with a partial AP in (13b).

(13) a. [Ein Buch ausleihen] will er *über Syntax*.
a book borrow wants-to he about syntax

b. [Treu bleiben] will er *seiner Frau*.
faithful remain wants-to he his wife

The example in (14) illustrates that such interaction is also possible with a partially fronted VP, in this case including a partial NP complement.

(14) [Ein Buch ausleihen] will er *ihr hierzu* aber nicht.
a book lend wants-to he her on-this but not

In proposing to analyze all three kinds of partial constituents and coherent constructions with an argument raising mechanism parameterized for the different categories, the theory we formalize below predicts this behavior.

Finally, one can observe that fronting of the complement of an NP or an AP together with the embedding verb is ungrammatical, as shown in (15).

(15) a. * [Über Syntax ausleihen] will er *ihr ein Buch*.
about syntax lend wants-to he her a book

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

This is parallel to the example (3c), which showed that the raised complements of a verb cannot be fronted without that verbal head. Our theory therefore explains these facts by requiring raised arguments to be saturated (or more specifically *independent*, a notion introduced below).

3 An HPSG analysis

We propose to generalize the argument raising approach to partial VP fronting of Pollard (1996) to partial constituent fronting in general. The idea is to introduce argument raising as a general option for different kinds of complements. To formalize this option, we define a lexical principle in the style of Meurers (1997a, 1997b) which introduces argument raising as a generalization in the mapping between the argument structure and the valence specifications of verbs.

In the lexicon, the argument structure is specified under the ARG-ST attribute, as shown in the lexical entries below.[4]

(16) a. $\begin{bmatrix} \text{PHON} & \langle \text{wollen} \rangle \\ \text{ARG-ST} & \left\langle NP, \begin{bmatrix} \text{L} \mid \text{C} \mid \text{HEAD} & \textit{verb} \\ \text{LEX} & + \end{bmatrix} \right\rangle \end{bmatrix}$ b. $\begin{bmatrix} \text{PHON} & \langle \text{empfehlen} \rangle \\ \text{ARG-ST} & \left\langle NP, \begin{bmatrix} \text{L} \mid \text{C} \mid \text{HEAD} & \textit{verb} \\ \text{LEX} & - \end{bmatrix} \right\rangle \end{bmatrix}$

c. $\begin{bmatrix} \text{PHON} & \langle \text{hoffen} \rangle \\ \text{ARG-ST} & \left\langle NP, \begin{bmatrix} \text{L} \mid \text{C} \mid \text{HEAD} & \textit{verb} \end{bmatrix} \right\rangle \end{bmatrix}$

In addition to the specification of the argument structure, the lexical entries also show that obligatorily coherent verbs verbs like *wollen* (want-to) in (16 a) mark their verbal complement as [LEX +], whereas obligatorily incoherent verbs like *empfehlen* (recommend) in (16 b) require it to be [LEX –]. The lexical entry of an optionally coherent verb like *hoffen* (hope) in (16 c) is underspecified and enforces no LEX restrictions on its complement.[5] Basically, marking a complement as [LEX –] corresponds to the X-bar schema

[4]The ARG-ST attribute is specified explicitly or derived by some kind of a linking theory. We assume argument raising to take place only with respect to the valence attributes, not on ARG-ST. The intuition behind this is that the argument structure should be a direct syntactic reflection of the semantic roles of a predicate.

[5] Kathol (1995) and Müller (1997) employ a special selection attribute (GOV or VCOMP) for complements of coherent verbs. This, however, results in two lexical entries for each optionally coherent verb instead of the underspecified single entry we propose here. Apart from this, regarding PVP topicalization their analyses make the same predictions as the one we propose here.

condition that non-heads have to be completed projections. But while the X-bar schema is a condition on structures, the LEX attribute lexicalizes this restriction, which makes it possible to relax the $[\text{LEX} -]$-complement requirement for heads of a specific lexical class to account for cluster formation in coherent constructions.

The lexical principle shown in figure 1.1 expresses how the argument structure specified in the ARG-ST list of the lexical entries of base form verbs[6] determines the values of the valence attributes (SUBJ and COMPS). The first element ($\boxed{1}$) of the argument structure is assigned to be the subject

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

Figure 1.1: The lexical argument-raising principle

and the rest of the arguments ($\boxed{2}$) are specified to surface on the COMPS list.[7] Appended ($\oplus$) to that COMPS list are the arguments raised from $\boxed{3}$. These raised arguments are required to be *indep(endent)*[8], i.e., saturated with respect to their complements and $[\text{LEX} -]$. This is also required of all arguments on ARG-ST except for the argument raising source $\boxed{3}$, which is shuffled ($\bigcirc$) into this list.

The relation *raised* defined in figure 1.2 specifies that the argument rais-

$$\begin{aligned} &\textit{raised}\left(\langle\rangle\right) := \langle\rangle. \\ &\textit{raised}\left(\left\langle \begin{bmatrix} \text{LEX} & + \\ \text{L} \mid \text{C} & \begin{bmatrix} \text{HEAD} & \textit{verb} \vee \textit{adj} \\ \text{V} \mid \text{COMPS} & \boxed{1} \end{bmatrix} \end{bmatrix} \right\rangle\right) := \boxed{1}. \\ &\textit{raised}\left(\left\langle \begin{bmatrix} \text{L} \mid \text{C} & \begin{bmatrix} \text{HEAD} & \textit{noun} \\ \text{V} \mid \text{COMPS} & \boxed{1} \end{bmatrix} \end{bmatrix} \right\rangle\right) := \boxed{1}. \end{aligned}$$

Figure 1.2: The argument raising sources

ing source is either empty, in which case no arguments are raised. Or it is

[6]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).

[7]To concentrate on the relevant issues, we here ignore subjectless and subject raising verbs, the integration of which is possible but requires a principle with a more complex mapping for subjects.

[8]Relations are written in the functional notation traditionally used in HPSG. Definition of *indep*:

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

a verb or adjective required to be [LEX +] from which the complements are returned to be raised. Finally, nouns can also return their complements, but different from verbs and adjectives the nouns are not required to be [LEX +].

Turning to the ID Principle in figure 1.3, the Cluster-Formation Schema (CF) licenses head-complement structures marked [LEX +] which consist of a *word* and a single [LEX +] complement. 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 (just like the constituents licensed by the other ID schemata not directly relevant here).

$$
\begin{bmatrix} \textit{phrase} \\ \text{DTRS} \ \textit{headed-struc} \end{bmatrix} \rightarrow
\begin{bmatrix} \text{S} \mid \text{LEX} \ + \\ \text{DTRS} \begin{bmatrix} \text{HEAD-DTR} & \textit{word} \\ \text{COMP-DTRS} & \left\langle \begin{bmatrix} \text{S} \mid \text{LEX} \ + \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \quad \text{(CF)}
$$
$$
\vee \begin{bmatrix} \text{S} \mid \text{LEX} \ - \\ \text{DTRS} \mid \text{HEAD-DTR} \ \textit{word} \end{bmatrix} \quad \text{(HC)}
$$
$$
\vee \begin{bmatrix} \text{S} \mid \text{LEX} \ - \\ \vdots \end{bmatrix} \quad \text{(other ID schemata)}
$$

Figure 1.3: The ID Principle

Two examples Now that the relevant machinery has been introduced, let us look at two examples involving partial topicalization. We start with the analysis of a sentence with a partial NP topicalization, the example shown in (17), which in addition to the simple case (1b) discussed above includes a verbal complex.

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

The analysis tree for this example is shown in figure 1.4. The interesting detail is how the fronted partial NP *ein Buch* and the verbal complex *ausleihen zu dürfen* are licensed. The lexical entry for the verb *ausleihen* (borrow/lend) is shown in (18).

$$
(18) \quad \begin{bmatrix} \text{PHON} & \langle \text{ausleihen} \rangle \\ \text{S} \mid \text{L} \mid \text{C} \mid \text{HEAD} & \textit{verb} \\ \text{ARG-ST} & \langle \textit{NP,NP} \rangle \end{bmatrix}
$$

The argument raising principle applies to *ausleihen* so that the NPs on ARG-ST can be argument raising sources as defined in figure 1.2. The occurrence of *ausleihen* in the tree in figure 1.4 can therefore raise the PP argument *hierzu* ($\boxed{3}$) from its nominal complement.

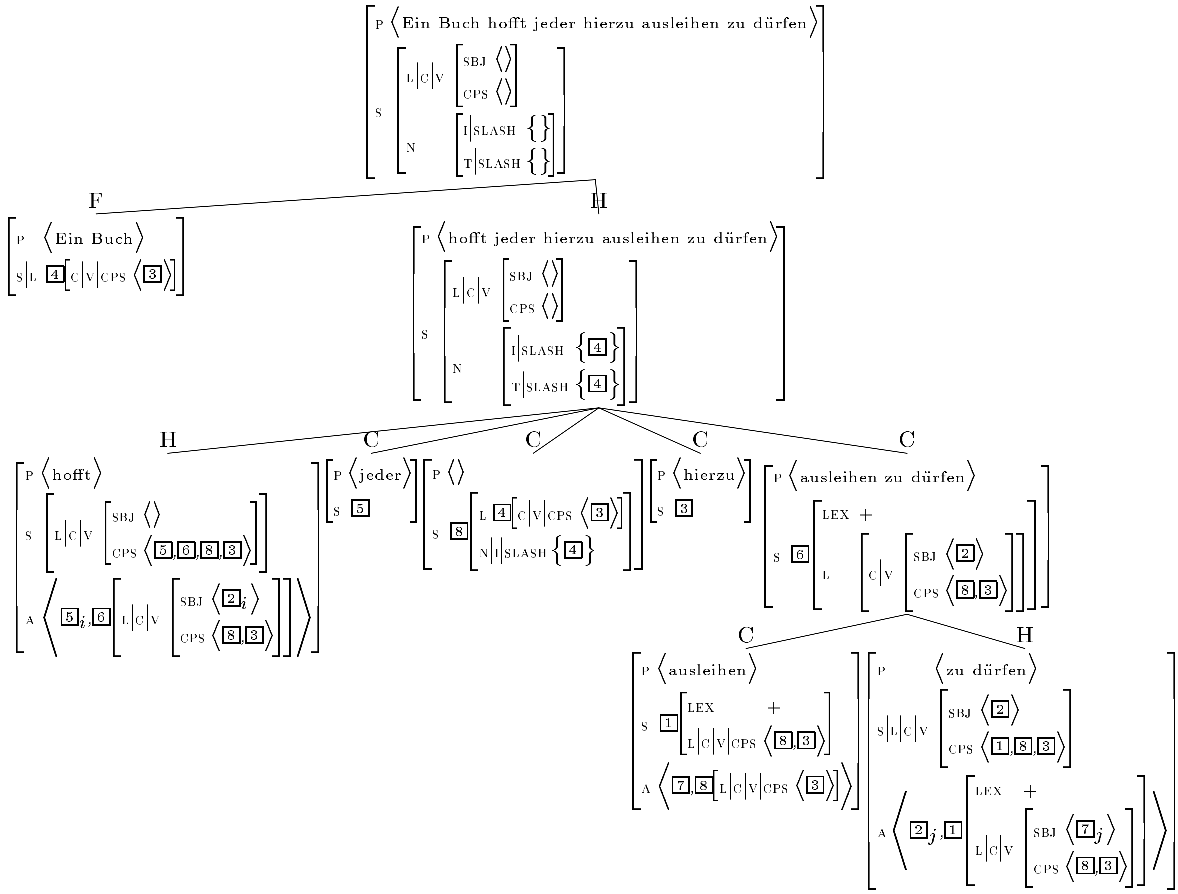

Figure 1.4: Topicalization of a partial NP in a sentence with a verbal complex

The verb *dürfen* belongs to the obligatorily coherent verbs; so it has a lexical entry like *wollen* in (16 a) and requires its verbal complement to be [LEX +]. The argument raising principle therefore has to raise the (trace of the) NP *ein Buch* ($\boxed{8}$) and the PP *hierzu* ($\boxed{3}$) from the verbal complement *ausleihen* ($\boxed{1}$) onto the COMPS requirements of *zu dürfen*.

The verb *hoffen* belongs to the optionally coherent verbs, for which a lexical entry was shown in (16 c). The argument raising principle ensures that the occurrence of *hofft* in the tree in figure 1.4 raises all independent complements from its verbal complement: the PP *hierzu* ($\boxed{3}$) and the (trace of the) NP *ein Buch* ($\boxed{8}$). But it cannot raise the verbal complement *ausleihen*, since *ausleihen* is unsaturated, i.e., not independent. 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 *hierzu*, and the subject NP *er* are then all realized in a flat head-complement structure.

The second analysis we want to show in detail is an example for a VP topicalization including a partial AP, namely the example (13b) we discussed in section 2.4. Such an example is interesting since here argument raising from an adjectival complement has to interact with argument raising from a topicalized verbal complement. The structure for this example as licensed by our theory is shown in figure 1.5. The important detail is how the topicalized

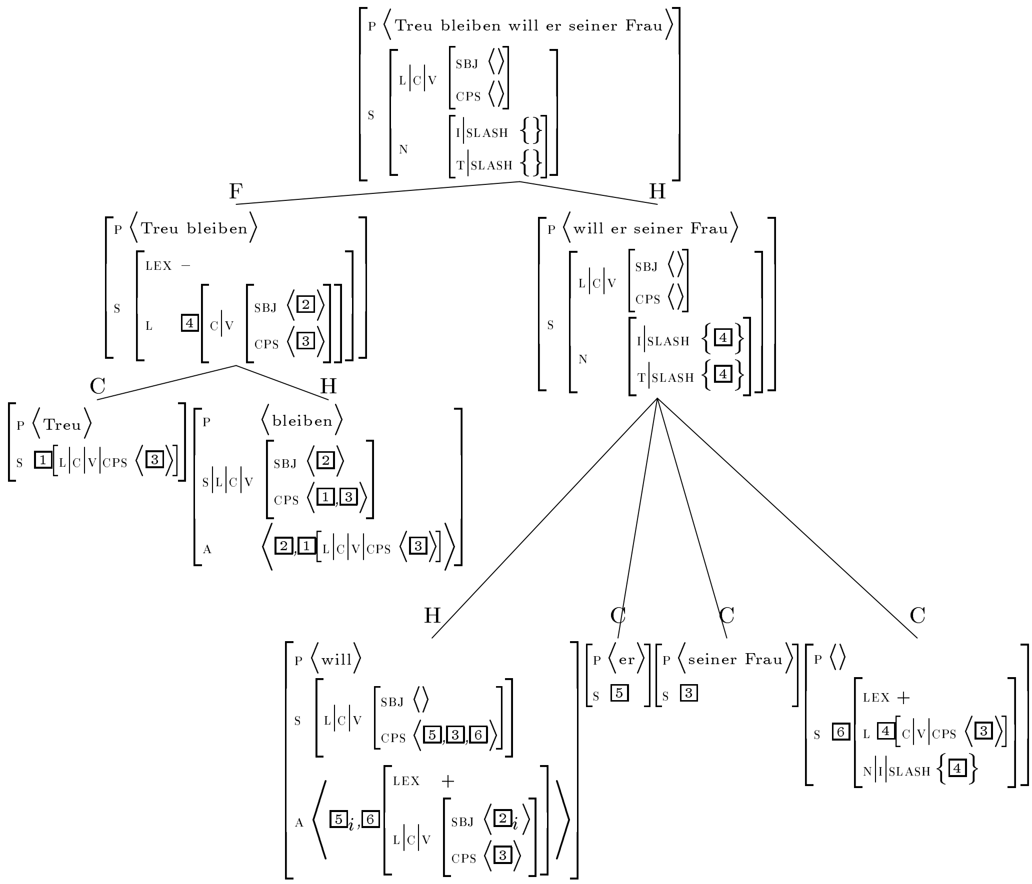

Figure 1.5: Fronting of a VP including a partial AP complement

constituent with its partial AP *treu bleiben* is licensed. The lexical entry of *bleiben* (stay) is shown in (19).

(19) $$\begin{bmatrix} \text{PHON} & \langle \text{bleiben} \rangle \\ \text{S} \mid \text{L} \mid \text{C} \mid \text{HEAD} & \textit{verb} \\ \text{ARG-ST} & \left\langle \textit{NP}, \begin{bmatrix} \text{L} \mid \text{C} \mid \text{HEAD} & \textit{adjective} \\ \text{LEX} & + \end{bmatrix} \right\rangle \end{bmatrix}$$

As discussed in the section 2.2 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 +], only this time it is an adjectival complement and not a verbal one. 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 *bleiben* in the tree in figure 1.5 raises the argument *seiner Frau* ($\boxed{3}$) from its adjectival complement *treu* ($\boxed{1}$). The remaining partial complement is then realized in a head-complement structure. The resulting VP *treu bleiben* is [LEX –] and has one element left on its COMPS list, the raised NP *seiner Frau* ($\boxed{3}$).

The verb *wollen* belongs to the obligatorily coherent verbs and requires its verbal complement to be [LEX +], as was shown in its lexical entry (16 a). Again, the argument raising principle ensures that the occurrence of *will* in the tree in figure 1.5 raises the NP *seiner Frau* ($\boxed{3}$) from (the trace of) its verbal complement *treu bleiben* ($\boxed{6}$). Note that for this to be possible, the trace must be [LEX +]. This does not conflict with the [LEX –] specification on the topicalized VP since, as usual, only the local information ($\boxed{4}$) is shared between the filler and the trace of the unbounded dependency construction, in which the LEX specification is not included (cf. Meurers 1998, St. Müller 1997). Having raised the NP *seiner Frau* ($\boxed{3}$) to the COMPS requirements of *will*, one can license a flat head-complement structure with *will* as head daughter and the NP *er*, the trace of the fronted VP, and the raised NP as complement daughters. The NP *seiner Frau* has thus been raised twice and is realized independent from its original head *treu*, as a complement of the verb *will*.

4 Conclusion

We presented an account for general partial constituent fronting in German. The account 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: partial APs, NPs, and VPs. The similarities derive from a generalization of the argument raising approach to PVPs: 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 between (partial) VP topicalization and partial NPs or APs.

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