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German Partial-VP Topicalization Revisited

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1 Introduction

The topicalization of partial verbal projections in German (henceforth: PVP topicalization) has received much attention because the variable constituency it displays is a challenge to the traditionally central role of constituent structure. In the HPSG framework, Pollard (1996, orig. ms. 1990), and more recently Hinrichs and Nakazawa (1994) and Nerbonne (1994) met this challenge with a variety of mechanisms and drew conclusions for the general architecture: Pollard showed how the extended notion of valence introduced by argument raising (Hinrichs and Nakazawa 1989) can be used to license the required multiple structures. Nerbonne introduced a non-monotonic device to relax certain requirements for fronted constituents and claimed that only a traceless analysis can provide a satisfactory account. Hinrichs and Nakazawa based their analysis on a special lexical rule constructing new constituents for topicalization only and strengthened the unbounded dependency mechanism to be able to license topicalized constituents containing a gap.

The purpose of this short paper is to reexamine whether the phenomenon of PVP topicalization supports these conclusions and which consequences should be drawn for the general architecture of HPSG.

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2 PVP topicalization and HPSG theory

It has become standard to analyze German verb-second sentences as verb-first structures from which an element has been topicalized. Leaving aside few classes of exceptions, the topicalized element is a) a single constituent which b) could also occur in non-topicalized position.

Under these two assumption (henceforth: topicalization assumptions), the phenomenon of PVP topicalization is problematic. To see why this is the case, consider the sentences in (1).[1] Example (1a) is an ordinary verb-first question. In (1b) the main verb and one object has been fronted, with the other object remaining in its "base position". In (1c) the main verb and the auxiliary is topicalized, leaving both objects behind. The problem is that under the two topicalization assumptions, no single structure can be found for (1a) that allows both topicalizations.

(1) a. Wird er ihr einen Ring schenken können?
   will he her a ring give be-able-to
   Will he be able to give her a ring?
  b. *Einen Ring schenken* wird er ihr können.
  c. *Schenken können* wird er ihr einen Ring.

Pollard (1996) proposes an HPSG theory using optional argument raising for auxiliaries in the style of Hinrichs and Nakazawa (1989) and a standard UDC mechanism employing traces. He shows that such an analysis can account for the data he discusses, but also points out that this is done at the cost of licensing multiple structures for sentences like (1a) – such as structures in which the accusative object *einen Ring* forms a constituent with the verb *schenken*, corresponding to the constituent topicalized in (1b), and others in which *schenken* and *können* form a constituent, as motivated by examples like (1c). Since these multiple structures are not independently motivated, they are spurious ambiguities which under most concepts of linguistic theory should be eliminated.

This is where Nerbonne (1994) and Hinrichs and Nakazawa (1994) pick up. Common to both proposals is that they keep the first topicalization assumption, i.e., that only a single constituent can be topicalized, but relax the second, the assumption that a topicalized constituent can also occur in non-fronted position. The basic idea thus is to license partial constituents only in fronted position. Reducing the two proposals to the essentials, we believe there are two key ingredients needed to exclude the spurious structures of the Pollard (1996) analysis:

[1] The example basically follows those discussed by Nerbonne (1994, example (1)) and Hinrichs and Nakazawa (1994, example (17)).

1. Instead of *optional* argument raising, which introduces the many subcategorization possibilities at the basis of the spurious structures, some version of *obligatory* argument raising must be employed.
2. The topicalized verb phrase must be exempt from this requirement.

We first turn to the different possibilities for enforcing obligatory argument raising.

2.1 Enforcing obligatory argument raising

Two versions of obligatory argument raising are proposed. Nerbonne (1994) proposes to raise *all complements* of the embedded verb and assumes flat structures with no verbal complex.[2] Hinrichs and Nakazawa (1994) raise only *all non-verbal complements* and assume a contoured, left-branching verbal complex.

The way to achieve obligatory argument raising is basically the same in both approaches. A new attribute LEX[3] is introduced with the idea of marking a verbal constituent as [LEX −] if it has realized either one or more complements (in the flat Nerbonne approach) or one or more non-verbal complements (in the contoured Hinrichs/Nakazawa approach). To enforce obligatory argument raising, it then suffices to specify the lexical entries of auxiliaries so that they require their verbal complement to be [LEX +].

In the Nerbonne approach, the idea of marking all verbal constituents in which complements are realized as [LEX −] is easily formalized by requiring every *phrase* to be [LEX −]. To obtain a theory enforcing a contoured verbal complex, Hinrichs and Nakazawa (1994) propose a slightly more complicated encoding. The head-complement schema is split up into a binary branching "Verbal Complex Schema" (their figure (6), p. 4) licensing [LEX +] constituents as the combination of a *word* head with a single verbal complement and a "Head-NP-Complement ID Schema" (their figure (21), p. 11) licensing [LEX −] constituents consisting of a head combining with any number of non-verbal constituents plus an optional verbal complement. Furthermore, the verbal complements are excluded from argument raising by specifying the elements raised to be non-verbal signs.

[2]Nerbonne (1994, p. 141) suggests that one might consider extending his proposal to accommodate a contoured verbal complex.

[3]Hinrichs and Nakazawa (1994) name the attribute NPCOMP and interpret its value as the polar opposite of the value of LEX. To have a uniform setup, we will call the attribute LEX throughout the paper; but note that different connotations were associated with the attribute name of the original proposal.

2.2 Relaxing obligatory argument raising for topicalization

With two methods for enforcing obligatory argument raising on our hands, the remaining issue is to find a way to relax the obligatory argument raising between an auxiliary and its topicalized verbal complement. Regarding this issue, Nerbonne says of his theory:

> "Phrasal PVPs are licensed in the Vorfeld first because they are licensed by a SLASH specification generated via the complement extraction rule (Pollard and Sag 1994, p. 446), with an important modification – the feature LEX is nonmonotonically relaxed on SLASH specifications. It is this nonmonotonic relaxing of LEX which ultimately explains the lack of perfect correspondence between Vorfeld "fillers" and Mittelfeld "sources"." (Nerbonne 1994, p. 127)

Hinrichs and Nakazawa (1994) introduce a new lexical rule, the "PVP-Topicalization Lexical Rule" (their figure (19), p. 10, henceforth: PVPTLR). This rule does not extract a constituent to be topicalized, but rather it creates a new verbal element for topicalization only. This "hand assembled" constituent is specified to share some selected properties with a verbal element subcategorized for by the input of the lexical rule. Furthermore, the PVPTLR uses a modified UDC mechanism to require complements missing from the topicalized verb phrase to be realized in the Mittelfeld. For this purpose, the SLASH feature is changed to take a set of *signs* as value instead of the more restrictive *local* objects usually assumed.

Looking back at the task to be achieved – to relax the obligatory argument raising requirement – a rather simple alternative solution comes to mind. Even though the LEX attribute has traditionally been assumed to be appropriate for *category* objects, to our knowledge no real arguments why this needs to be the case have been given. Thus, it is unproblematic to make LEX appropriate for *synsem* objects instead. The standard UDC mechanism only identifies the *local* properties of a filler and a trace so that having LEX as attribute of *synsem* objects will have the effect that the LEX property is no longer shared between a filler and its trace.[4] As a result, the topicalized constituent does not have to obey the obligatory argument raising enforced by $\left[\text{LEX } +\right]$ on its trace. Note that this makes argument raising optional only for the topicalized constituent itself; argument raising remains obligatory for the subconstituents of the topicalized element.

Before we can show how this idea is spelled out by describing how the original Pollard (1996) proposal can be modified to exclude the spurious structures, there are two relevant issues left to discuss: the use of traces and the directionality of branching in contoured verbal complexes.

[4]Independently, Müller (1996) also came up with the idea to relocate the LEX attribute to *synsem* in order to relax the LEX restriction on topicalized PVPs.

2.3 Related issues

2.3.1 Traces

The theory proposed by Nerbonne (1994) employs a complement extraction lexical rule to obtain a traceless theory of unbounded dependencies. In connection with this choice, he makes the following claim:

> "The key to eliminating the spurious ambiguity problem [...] is the elimination of traces in favor of an analysis in which long distance dependence is grounded not in a missing constituent, but rather in an unrealized functor-argument relation." (Nerbonne 1994, p. 117)

On closer inspection, this claim turns out to be false. A PVP topicalization account works equally well with traces. The trace can stand for a topicalized constituent which happens to be a partial-VP. Due to argument raising, the verbal head selecting the trace then attracts the complements not yet realized in the topicalized constituent. To illustrate this, the theories discussed in section 3.2 all make use of a standard UDC mechanism employing traces.

On pp. 147f. Nerbonne (1994) notes independent motivation for abandoning traces. He claims that in an analysis employing traces, another kind of spurious ambiguity can arise, e.g., in complex VPs, because "there is no nonarbitrary single location at which a "trace" might be posited." However, if only the phonologies are ordered, as assumed in standard HPSG (cf., Pollard and Sag 1987, pp. 169ff.), this is not the case since the phonology of a trace is the empty list and therefore *a trace is not linearized* at all.[5] The phonology of each sign is a list of phonological symbols. It is these symbols that are linearized, not the lists themselves. Traces have an empty list as phonology.

2.3.2 Left- and right-branching verbal complexes

Two different styles of verbal complexes have been proposed for German. Hinrichs and Nakazawa employ a traditional left-branching structure for the verbal complex. Kiss (1992) proposes a right-branching one, in which the auxiliaries combine one by one and the main verb is added at the end.[6] Kiss (1992, pp. 281ff.) himself states that the analysis he proposes cannot account for VP-topicalization if the two topicalization assumptions are made, because the constituent structure needed for topicalization is not contained

[5] Cf., also Pollard and Moshier (1990, pp. 291f.) for a discussion to the end that empty constituents have no word order properties. Kathol (1995, pp. 152f) comes to the same conclusion for a linearization-based variant of HPSG explicitly encoding domain objects.

[6] Some additional motivation for a right-branching verbal complex structure is discussed in Meurers (1997a).

in the structure he assigns to a verb-first sentence. However, if we take a closer look at the problem his analysis has with VP-topicalization, it turns out to be the same problem which we discussed for the PVP-topicalization analyses avoiding spurious ambiguities above – namely that one has to allow elements which do not form a constituent in the structure assumed for verb-first sentences to be topicalized as a constituent. Thus, as shown in section 3.2.3, our analysis idea for PVP topicalization carries over to an analysis of (P)VP topicalization using the right-branching structures of Kiss.

3 Modifying Pollard (1996) to exclude spurious structures

This section provides a more formal proposal of how Pollard's original theory can be modified to exclude the spurious structures. First, we review the basic ingredients of Pollard's theory. Then, we discuss the modifications which are necessary to obtain a theory licensing only flat structures in the style of Nerbonne. Finally, we introduce the modifications of Pollard's theory needed to obtain theories licensing contoured structures à la Hinrichs/Nakazawa and à la Kiss.

3.1 Pollard's original theory

We briefly review the lexical entries of auxiliaries and the ID schemata proposed by Pollard (1996). The principles (Head-Feature Principle, Subcat Principle, ...) Pollard uses are rather standard and carried over without discussion.

Figure 1 shows the lexical entry of the non-finite form of the perfect auxiliary *haben*.[7] While the verbal complement is encoded on SUBCAT, the

$$\begin{bmatrix} \textsc{phon} & \langle \textit{haben} \rangle \\ \textsc{s}\,|\,\textsc{l}\,|\,\textsc{c} & \begin{bmatrix} \textsc{head} & \begin{bmatrix} \textit{verb} & \\ \textsc{vform} & \textit{bse} \end{bmatrix} \\ \textsc{subject} & \{\boxed{1}\} \\ \textsc{subcat} & \left\{ (P)VP_{psp} \begin{bmatrix} \textsc{l}\,|\,\textsc{c} & \begin{bmatrix} \textsc{subject} & \{\boxed{1}\} \\ \textsc{subcat} & \boxed{2} \end{bmatrix} \end{bmatrix} \right\} \cup \boxed{2} \end{bmatrix} \end{bmatrix}$$

FIGURE 1 Pollard (1996, p. 300): Lexical entry for the base-form auxiliary *haben*

subject valence of non-finite verbs is encoded on a separate SUBJECT attribute. The structure sharing of $\boxed{1}$ between the SUBJECT attribute and

[7]Here and throughout the paper, the following attributes for space reasons sometimes are abbreviated by their initial letter: SYNSEM, LOCAL, NONLOCAL, INHERITED, TO-BIND, CAT, and HEAD. Additionally, SBC abbreviates SUBCAT.

that of the selected verbal complement indicates that *haben* is analyzed as a subject-raising verb. Finally, the valence requirements encoded on the SUBCAT attribute of the selected verbal complement are raised by unioning them to subcategorization requirements of *haben*.[8]

Figure 2 shows the lexical entry of the finite future auxiliary *wird*. The

$$\begin{bmatrix} \text{PHON} & \left\langle \textit{wird} \right\rangle \\ \text{S}\,|\,\text{L}\,|\,\text{C} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{VFORM} & \textit{fin} \end{bmatrix} \\ \text{SUBCAT} & \left\{ \boxed{1} NP_{nom},\, \big(\text{P}\big) VP_{bse} \begin{bmatrix} \text{L}\,|\,\text{C} & \begin{bmatrix} \text{SUBJECT} & \left\{\boxed{1}\right\} \\ \text{SUBCAT} & \boxed{2} \end{bmatrix} \end{bmatrix} \right\} \cup \boxed{2} \end{bmatrix} \end{bmatrix}$$

FIGURE 2 Pollard (1996, p. 299): Lexical entry for the finite auxiliary *wird*

SUBCAT set of finite auxiliaries consists of two elements, the subject NP and the non-finite verbal complement from which, just like in the non-finite case, the complements are raised.

The two relevant ID Schemata are shown in figure 3.[9] Schema B' licenses non-finite verbal projections where the head is a *word* and combines with any number of its complements. Schema C licenses finite verbal projections in which all of the complements are realized.

$$\begin{array}{lll} \begin{bmatrix} \textit{phrase} & \\ \text{DTRS} & \textit{headed-struc} \end{bmatrix} \rightarrow & \begin{bmatrix} \text{S}\,|\,\text{L}\,|\,\text{C}\,|\,\text{SUBJ} & \left\{\boxed{1}\right\} \\ \text{DTRS}\,|\,\text{HEAD-DTR} & \begin{bmatrix} \textit{word} & \\ \text{S}\,|\,\text{L}\,|\,\text{C}\,|\,\text{SUBJ} & \left\{\boxed{1}\right\} \end{bmatrix} \end{bmatrix} & \text{(Schema B')} \\ \qquad\qquad\qquad\qquad \vee & \begin{bmatrix} \text{S}\,|\,\text{L}\,|\,\text{C} & \begin{bmatrix} \text{SUBJ} & \{\} \\ \text{SUBCAT} & \{\} \end{bmatrix} \end{bmatrix} & \text{(Schema C)} \\ \qquad\qquad\qquad\qquad \vee & \quad \ldots & \text{(Schemata D, E, F)} \end{array}$$

FIGURE 3 Pollard (1996): ID Schemata B' and C

To illustrate this, the two structures for example sentence (1a) discussed in section 2 are shown in figures 4 and 5. In figure 4, *schenken* combines with its accusative complement, while its dative complement is raised to become a complement of *können* and further raised to become a complement of *wird*, as which it is finally realized. In figure 5, on the other hand, *schenken*

[8]Traditionally argument raising is explicitly specified in the lexical entries of an intuitively understood lexical class, like in the lexical entry shown in figure 1. Meurers (1997b) shows how argument raising can be introduced by lexical principles as a theoretical generalization over a class of words.

[9]The schemata A and B (without prime) "missing" here are introduced in (Pollard 1996) for English only.

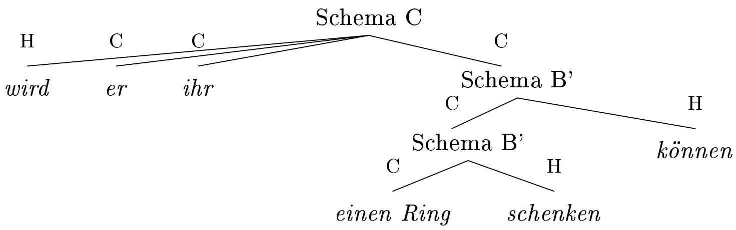

FIGURE 4 A structures for (1a) with [*einen Ring schenken*] as constituent

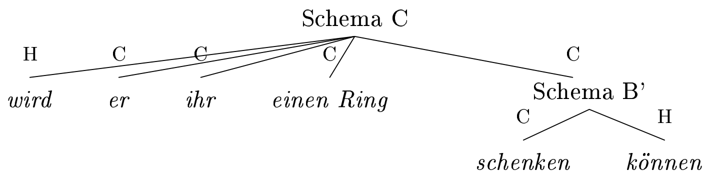

FIGURE 5 One of the structures for (1a) with [*schenken können*] as constituent

combines directly with *können*, which raises both of the NP arguments. Those are then raised further to *wird*, in order to be realized as complements of that auxiliary.

3.2 Three theories for PVP topicalization

We base the three theories introduced below on the proposal of Pollard (1996) and change only those aspects of direct relevance to the issues under discussion. In the feature geometry, the *boolean*-valued attribute LEX is introduced for *synsem* objects as discussed in section 2.2. For ease of notation, we make one further modification: Following a suggestion in (Kiss 1992), Pollard's attribute SUBJ is introduced for *head* instead of for *category*. As a result, the Head-Feature Principle takes care of the correct percolation of SUBJ in non-finite verb projections and no separate mention of SUBJ in the schemata is needed.

3.2.1 Theory 1: Flat structures

In a theory licensing completely flat structures, as proposed by Nerbonne, we need to ensure that all phrases are $\left[\text{LEX } -\right]$. Rather than adding this specification to the mother in Pollard's head-complement schemata B' and C (and the other schemata), we can express this in the simple principle shown in figure 6.

$$\textit{phrase} \rightarrow \left[\text{SYNSEM} \mid \text{LEX } -\right]$$

FIGURE 6 Theory 1: A principle requiring phrases to be $\left[\text{LEX } -\right]$

The lexical entries of the auxiliaries are modified to require their verbal complement to be $\left[\textsc{lex}\ +\right]$.[10] We thus obtain the lexical entry for the finite future auxiliary *wird* shown in figure 7.

$$\begin{bmatrix} \textsc{phon} & \langle \textit{wird} \rangle \\ \textsc{s}\,|\,\textsc{l}\,|\,\textsc{c} & \begin{bmatrix} \textsc{head} & \begin{bmatrix} \textit{verb} \\ \textsc{vform}\ \textit{fin} \end{bmatrix} \\ \textsc{subcat} & \left\{ \boxed{1} NP_{nom},\ VP_{bse} \begin{bmatrix} \textsc{lex} & + \\ \textsc{loc}\,|\,\textsc{cat} & \begin{bmatrix} \textsc{head}\,|\,\textsc{subject} & \{\boxed{1}\} \\ \textsc{subcat} & \boxed{2} \end{bmatrix} \end{bmatrix} \right\} \cup \boxed{2} \end{bmatrix} \end{bmatrix}$$

FIGURE 7 Theory 1: Lexical entry for the finite auxiliary *wird*

This minimally modified Pollard theory succeeds in eliminating the spurious ambiguity problem. But a completely flat analysis can also be achieved with only one head-complement schema replacing Pollard's schemas B' and C, which is shown in figure 8.[11] This schema licenses all head-complement constructions whose head daughter is a *word*.

$$\begin{array}{lll} \begin{bmatrix} \textit{phrase} \\ \textsc{dtrs}\ \ \textit{headed-struc} \end{bmatrix} \rightarrow & \left[\textsc{dtrs}\,|\,\textsc{head-dtr}\ \ \textit{word}\right] & \text{(HC Schema)} \\ \vee & \ldots & \text{(Schemata D, E, F)} \end{array}$$

FIGURE 8 Theory 1: One head-complement ID schema

To illustrate this first theory using the single head-complement schema, the structure licensed for the PVP topicalization example (1b) is shown in figure 12 (appendix). Note that just as in the original theory of Pollard, the analysis uses a standard UDC mechanism employing traces.

3.2.2 Theory 2: Left-branching verbal complexes

To obtain a theory licensing "Hinrichs/Nakazawa-style" left-branching verbal complexes, in addition to the schema for $\left[\textsc{lex}\ -\right]$ constituents we need a second head-complement schema to license binary branching verbal complexes. So we define a variant of Hinrichs/Nakazawa's Verbal Complex ID Schema. Both schemata are shown in figure 9.

Since we cannot force all phrases to be $\left[\textsc{lex}\ -\right]$ as done in the first theory, we need to explicitly require this in the HC Schema. Our second schema

[10] Note that here it is not possible to eliminate the LEX attribute by requiring the verbal complements to be of type *word* since the SUBCAT set only contains *synsem* objects.
[11] The original theory of Nerbonne (1994) also contains two head-complement schemata since he uses a special schema to license topicalized constituents.

$$\begin{bmatrix} \textit{phrase} \\ \textsc{dtrs}\ \ \textit{headed-struc} \end{bmatrix} \rightarrow \begin{bmatrix} \textsc{s} \mid \textsc{lex} & - \\ \textsc{dtrs} \mid \textsc{head-dtr} & \textit{word} \end{bmatrix} \qquad \text{(HC)}$$

$$\vee \begin{bmatrix} \textsc{s} \mid \textsc{lex} & + \\ \textsc{dtrs} & \begin{bmatrix} \textsc{head-dtr} & \textit{word} \\ \textsc{comp-dtrs} & \left\langle \begin{bmatrix} \textsc{s} \mid \textsc{l} \mid \textsc{c} \mid \textsc{head} & \textit{verb} \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \qquad \text{(VC)}$$

$$\vee \quad \ldots \qquad \text{(Schemata D, E, F)}$$

FIGURE 9 Theory 2: Two head-complement ID schemata

licenses binary branching head-complement constructions marked [LEX +] whose head daughter is a *word* and whose complement daughter's head value is *verb*.

As discussed in section 2.1, we also need to change the specification of the lexical entries of auxiliaries to exclude verbal complements from argument raising. We require this indirectly by adding a specification to the lexical entries of auxiliaries which requires each argument raised to be [LEX –].

To illustrate the resulting proposal, the structure of the PVP topicalization example (1b) as assigned by this second theory is shown in figure 13 (appendix). In this figure, the tree in which the auxiliary *können* combines with the trace is licensed by the binary head-complement schema.

3.2.3 Theory 3: Right-branching verbal complexes

Finally, to get a theory licensing a structure with a "Kiss-style" right-branching verbal complex, we need to specify two different head-complement schemata. The first head-complement schema licenses constructions marked [LEX –] with a head daughter of type *word* and complement daughters marked [LEX –]. The verbal-complex schema licenses binary branching head-complement constructions marked [LEX –] whose complement daughter is marked [LEX +] and has the HEAD value *verb*. The two schemata are shown in figure 10.

As lexical entries for the auxiliaries, this third theory uses those of the original Pollard theory shown in figures 1 and 2, which do not make reference to the LEX attribute. Obligatory argument raising in this theory follows from the interaction of the LEX specification in the two head-complement schemata alone.

Again, we illustrate this third theory by showing the structure of the PVP topicalization example (1b) in figure 14 (appendix). However, while figure 14 shows the relevant distribution of specifications, the example is not complex enough to actually show the difference in structure between a left-

$$\begin{bmatrix} \textit{phrase} \\ \text{DTRS} \ \textit{headed-struc} \end{bmatrix} \rightarrow \begin{bmatrix} \text{S} \mid \text{LEX} & - \\ \text{DTRS} & \begin{bmatrix} \text{HEAD-DTR} & \textit{word} \\ \text{COMP-DTRS} & \textit{list}\left(\begin{bmatrix}\text{S} \mid \text{LEX} & -\end{bmatrix}\right) \end{bmatrix} \end{bmatrix} \qquad \text{(HC)}$$

$$\vee \begin{bmatrix} \text{S} \mid \text{LEX} & - \\ \text{DTRS} & \begin{bmatrix} \text{COMP-DTRS} & \left\langle \begin{bmatrix} \text{S} & \begin{bmatrix} \text{L} \mid \text{C} \mid \text{HEAD} & \textit{verb} \\ \text{LEX} & + \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \qquad \text{(VC)}$$

$$\vee \qquad \ldots \qquad \text{(Schemata D, E, F)}$$

FIGURE 10 Theory 3: Two head-complement ID schemata

and the right-branching theory. The figure 11 therefore illustrate the structures assigned to the verbal complex of the same sentence with one more modal auxiliary: *Einen Ring schenken wird er ihr können müssen* (It must be the case that he will be able to give her a ring).

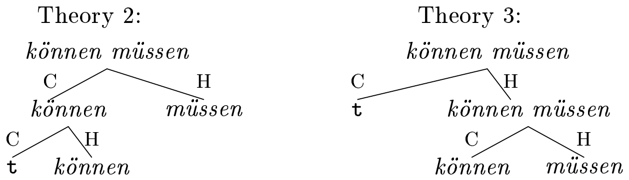

FIGURE 11 Left-branching and right-branching verbal complex structures

4 Summary

On the basis of two recent proposals for PVP topicalization, Hinrichs and Nakazawa (1994) and Nerbonne (1994), we identified two essential ingredients that are required to exclude the spurious structures licensed by the original Pollard (1996) proposal: obligatory instead of optional argument raising, and a method to exclude the relation which holds between the topicalized constituent and the verb of which it is a complement from this requirement. While both proposals successfully introduce a version of obligatory argument raising, the conclusions drawn in connection with the second issue were shown to be less convincing. In particular, we showed that there is no need for a nonmonotonic device to relax specifications or "hand-assembled" constituents since it is sufficient to make LEX appropriate for *synsem* instead of for *category* in order to make argument raising non-obligatory for topicalized constituents.

We backed up our claim that the identified ingredients are the essential ones by illustrating that it is sufficient to introduce them into the original theory of Pollard (1996) to eliminate the spurious ambiguities. Since this proposal makes use of traces, we thereby falsified Nerbonne's claim that traces are the source of the problem; both a traceless analysis and an analysis employing traces are equally possible.

Finally, in formalizing three different theories, we showed that a flat structure without a verbal complex, a structure with a left-branching verbal complex, and a structure with a right-branching verbal complex are equally suitable for PVP topicalization. This shows that in an approach employing argument raising, the selectional properties encoded in the valence attributes and the constituent structure are related much more indirectly than traditionally assumed.

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FIGURE 12 Theory 1: The "Nerbonne-style" structure for sentence (1b)

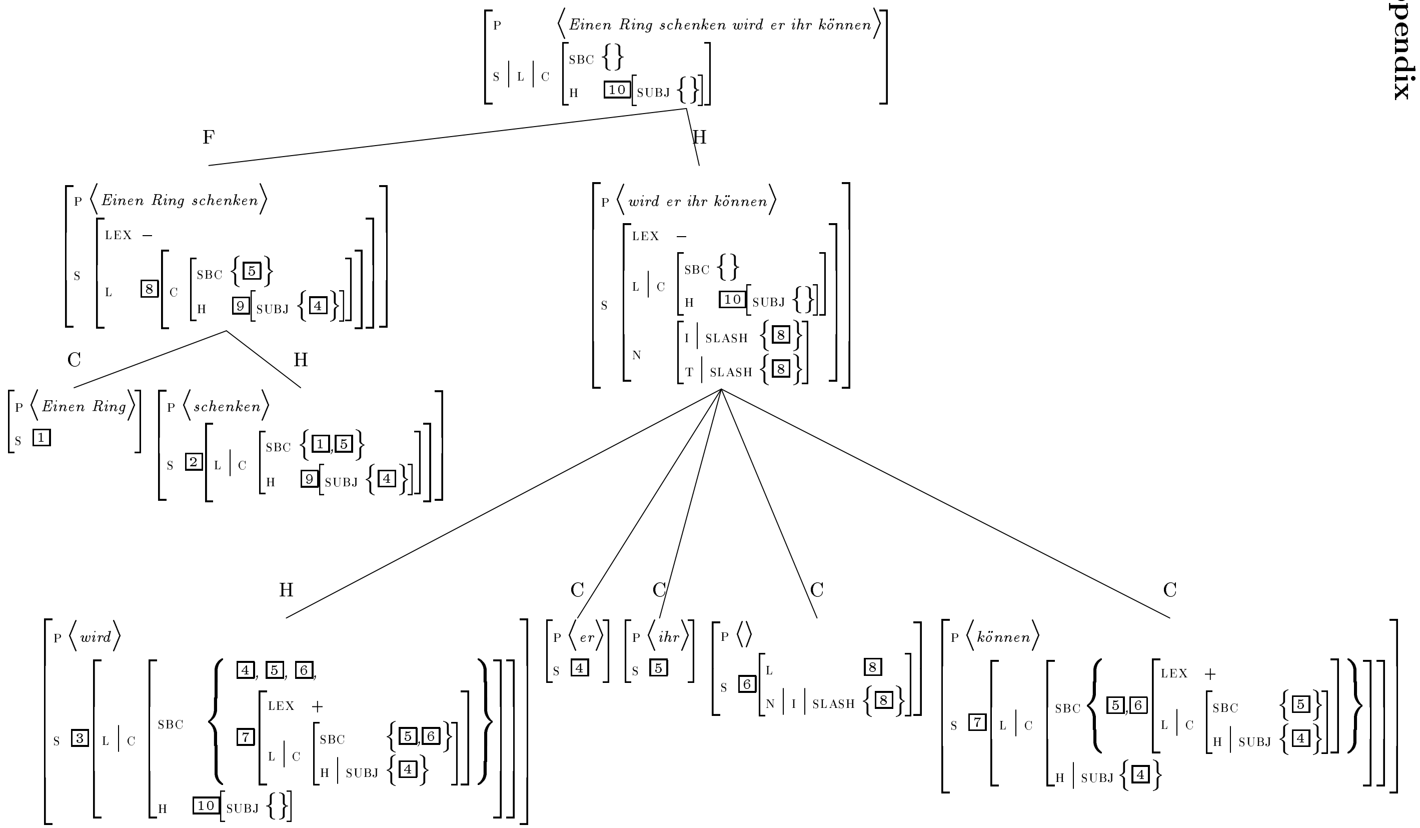


FIGURE 13 Theory 2: The "Hinrichs/Nakazawa-style" structure for sentence (1b)

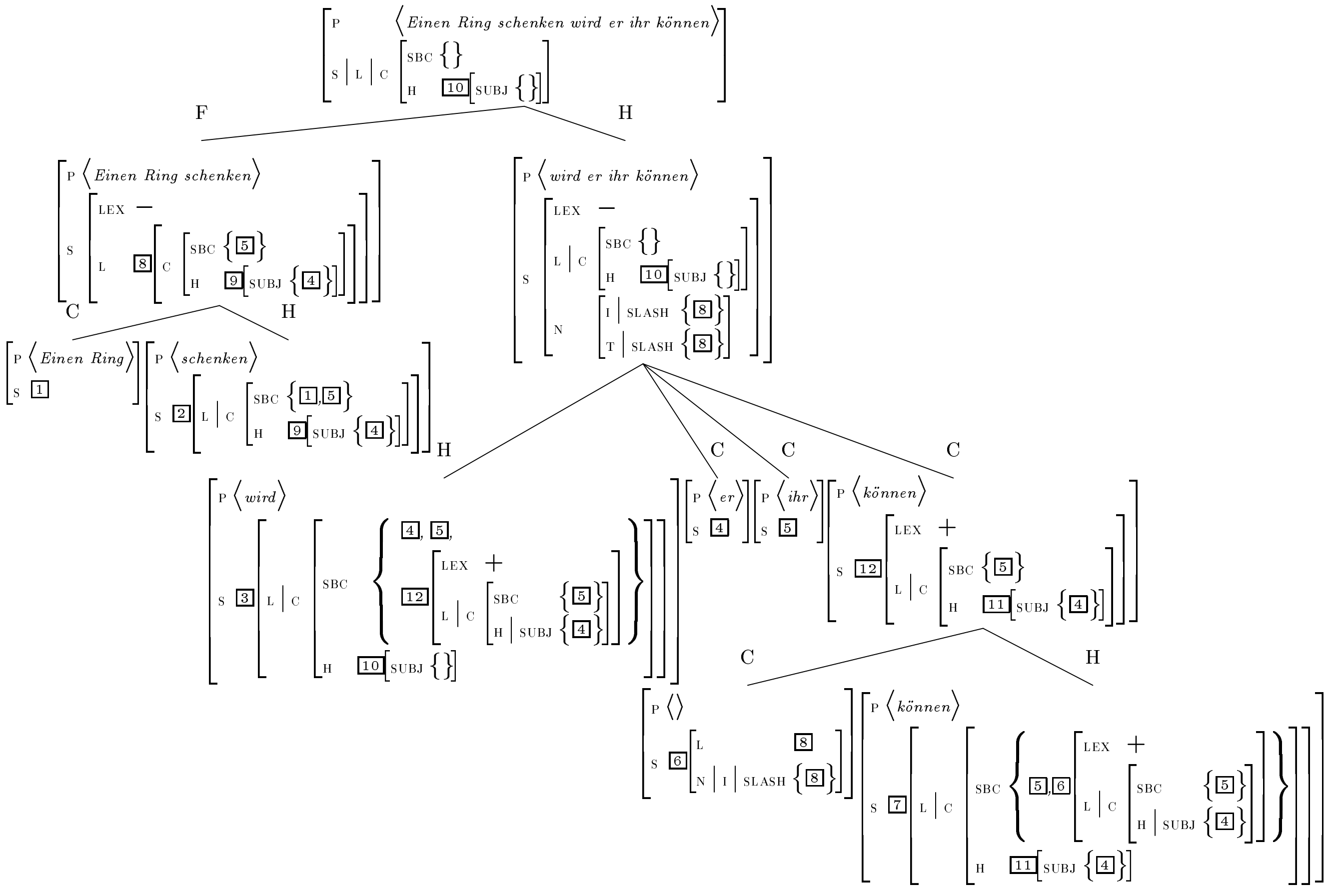
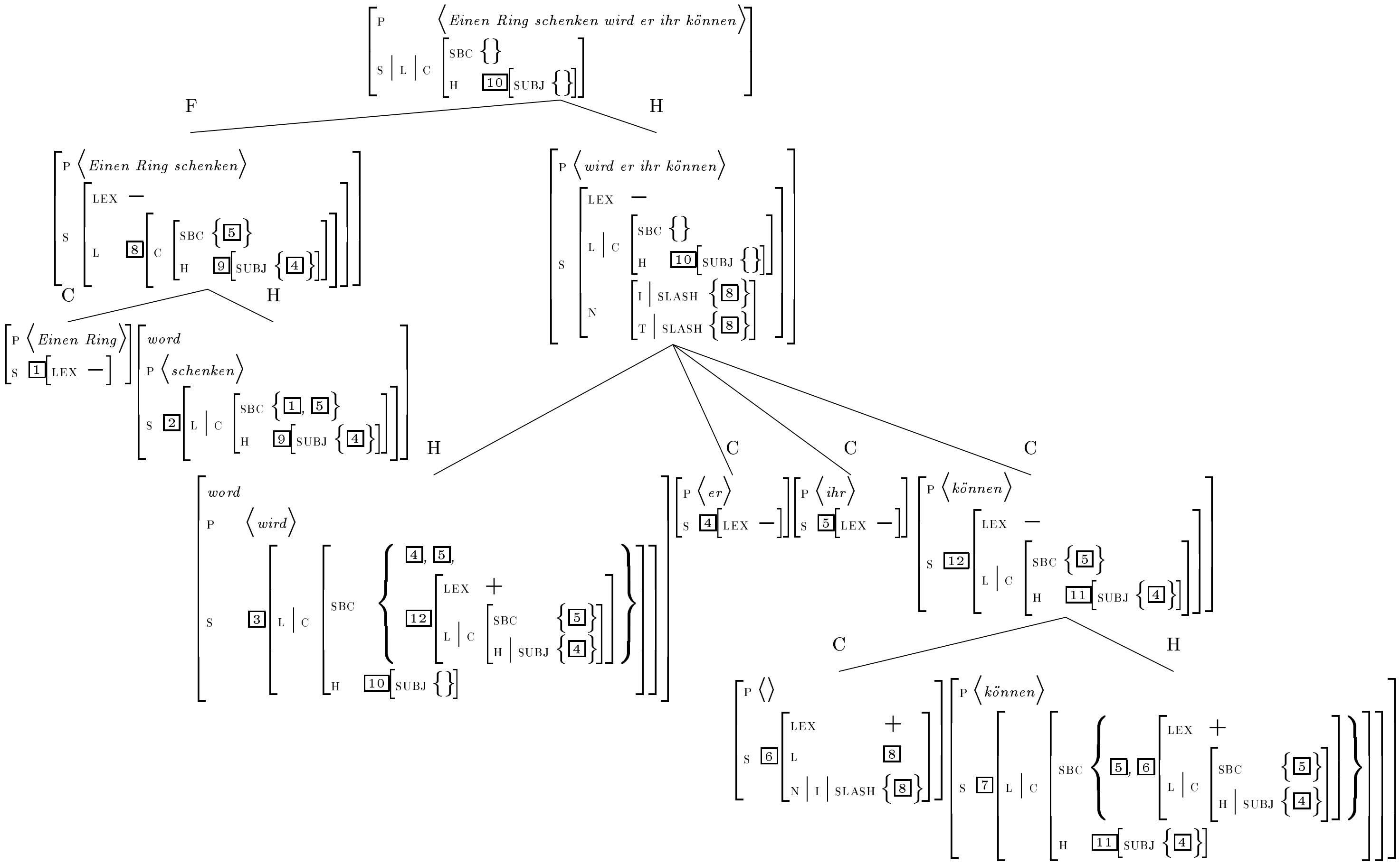


FIGURE 14 Theory 3: The "Kiss-style" structure for sentence (1b)



xv