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German Partial-VP Fronting Revisited – Back to Basics

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Introduction The topicalization of partial verbal projections in German (henceforth: PVP topicalization) has received much attention over the last couple of years, most recently in two papers by Hinrichs and Nakazawa (1994) and Nerbonne (1994). What makes it interesting to take a second look at this topic are the conclusions drawn by the authors and the methods they use to capture the phenomenon: Nerbonne claims that only a traceless analysis can provide a satisfactory account. Furthermore, he introduces a nonmonotonic device to relax certain requirements for fronted constituents. Hinrichs and Nakazawa base their analysis on a lexical rule constructing new constituents for topicalization only. And they enlarge the value of the SLASH attribute to be able to refer to the SLASH value of a SLASH value. The purpose of this short paper is to reexamine whether the phenomenon of PVP topicalization supports these conclusions and their consequences for the general architecture of HPSG.

PVP-Topicalization and HPSG theory It has become standard to analyze German verb-second sentences as a verb-first sentence 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:

Example (1a) is a 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.[1] The problem is that under the above topicalization assumptions no single structure can be found for (1a) that allows both topicalizations.

(1)	a.	Wird	er	ihr	den	Ring	schenken	können?
		will	he	her	the	ring	give	be-able-to
		Will he be able to give her the ring?						

b. *Einen Ring schenken* wird er ihr können.

c. *Schenken können* wird er ihr den Ring.

Pollard (1990) proposes an HPSG theory using optional argument raising for auxiliaries in the style of Hinrichs and Nakazawa (1989) and a standard topicalization account 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). Since these 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 but relax the second. The basic idea is to license partial constituents only in fronted position. In order for this idea to exclude the spurious structures of the Pollard (1990) analysis, we believe two things are needed: 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 used. 2. The topicalized verb phrase must be exempt from this requirement.

[1] The example here basically follows that given in (1) of Nerbonne (1994) or (17) of Hinrichs and Nakazawa (1994).

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. Hinrichs and Nakazawa (1994) raise only *all non-verbal complements* and assume a contoured verbal complex. The way to achieve obligatory argument raising is basically the same in both approaches: a new attribute LEX[2] is introduced with the idea of marking a verbal constituent as [LEX -] if it has realized either one or more complements (in the flat approach) or one or more non-verbal complements (in the contoured 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 +]. To obtain a theory enforcing a contoured verbal complex, Hinrichs and Nakazawa (1994) do two things in addition: Verbal complements are excluded from argument raising[3] and the head-complement schema needs to be split up into a binary branching Verbal Complex Schema licensing [LEX +] constituents as the combination of a *word* head with a verbal complement and another schema licensing [LEX -] constituents consisting of a head combining with any complements.[4]

A discussion to motivate a choice between the two versions of obligatory argument raising has to be postponed to a full length paper. Here it is sufficient to see that both approaches manage to enforce a version of obligatory argument raising.

Relaxing obligatory argument raising for the topicalized element With two methods to enforce obligatory argument raising (and thus exclude multiple structures) on our hands, the issue now is to find a way to relax the obligatory argument raising between an auxiliary and its topicalized verbal complement. In Nerbonne's 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, 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 (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 made' 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, i.e., the LEX specification, for topicalized elements – a rather simple alternative solution comes to mind: Since in the standard UDC theory only the *local* properties are shared between a filler and a trace, it suffices to make the LEX attribute appropriate for *synsem* objects instead of for *cat* objects as in the two theories discussed.[5] Then the LEX property is no longer shared between a filler and its trace, and therefore the topicalized constituent does not have to obey the obligatory argument raising constraint [LEX +] enforced on its trace.

The trace issue Related to the issue of argument raising is Nerbonne's claim that "As must be expected, the analysis foresees no use of traces. Since a trace is an 'atomic constituent', analogous to a word, the simple use of traces would guarantee the difficulty illustrated in (1) above." (Nerbonne 1994, p. 110)[6] On closer inspection, this claim turns out to be false: A theory like Nerbonne's works equally well with traces,

[2]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 use the LEX attribute throughout.

[3]Hinrichs and Nakazawa (1994) enforce this directly by specifying the list of elements raised to be a list of non-verbal signs. Another possibility would be to follow Chung (1993), Rentier (1994), and Kathol (1995) by splitting up the valence attribute into VCOMP for verb complements and SUBCAT for others. Then only SUBCAT elements are raised.

[4]The second head-complement schema of Hinrichs and Nakazawa (1994), i.e., the Head-NP-Complement ID Schema displayed as (21) on p. 11, actually is more complicated. But this plays no role here.

[5]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. Independently, Stefan Müller also came up with the idea to relocate the LEX attribute to *synsem* in order to relax the LEX restriction on topicalized PVPS.

[6]A further quote elaborating the issue is: "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)

since argument raising provides the relevant constituents. To illustrate this, the theory discussed below and the PVP topicalization examples in the appendix do use a standard UDC theory 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.[7] To see why this is so consider first the linearization of signs with a non-empty phonology: The phonology of each sign is a list of phonological symbols. It is these symbols that are linearized, not the lists themselves. In the trace case, the phonology is the empty list, so nothing is linearized.

Left- and Right-branching Verbal Complexes Two different styles of verbal complexes have been proposed for German: Hinrichs and Nakazawa use 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. 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 in the structure he assigns to a verb-first sentence. He then mainly argues against the assumption that only a single constituent can be topicalized.

Taking a closer look at the problem his analysis has with VP-topicalization, we notice that it is basically only another instance of the problem we discussed for PVP topicalization above: To get all PVP topicalization possibilities we need different structures (e.g., [verb aux], [np verb], ...). Under the two topicalization assumptions these structures also show up in base position where they cause spurious ambiguity. So when only one structure is allowed in base position to eliminate these spurious structures, we don't have all the structures which we need for topicalization - which is exactly Kiss's problem. It turns out that the solution for PVP topicalization is also a solution which makes VP-topicalization (and PVP) with Kiss's structures possible. This is illustrated at the end of the next section.

Modifying Pollard (1990) to exclude the spurious structures We finish this short paper by showing how Pollard's original theory can be modified to exclude the spurious structures. First, the modifications for a theory licensing flat structures in the style of Nerbonne is introduced. Second, the modifications for more contoured structures à la Hinrichs/Nakazawa are given. Finally, the modifications for a contoured right-branching verbal complex à la Kiss are given.

For all three theories, the *boolean*-valued attribute LEX is introduced for *synsem* objects and the lexical entries of auxiliaries are modified to specify their verbal complement to be $\left[\text{LEX } +\right]$. 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 HFP takes care of the correct percolation of SUBJ in non-finite verb projections and no separate mention of SUBJ in the schemata is needed.

To obtain a Nerbonne style theory, a $\left[\text{LEX } \text{-}\right]$ specification needs to be added to the mother in Pollard's head-complement schemata B' and C. While this does the job, a completely flat analysis can also be achieved with only one head-complement schema replacing Pollard's schemas B' and C:[8] This schema licenses all head-complement constructions marked $\left[\text{LEX } \text{-}\right]$ whose head daughter is a *word*. Figure 1 in the appendix shows the structure of the PVP topicalization example (1b) as assigned by this modified Pollard theory with the single head-complement schema. Note that just as in the original theory of Pollard, the analysis uses a standard UDC theory employing traces.

To obtain a Hinrichs/Nakazawa style theory, two additional things need to be done (as discussed in the paragraph 'Enforcing obligatory argument raising'). We exclude verbal complements from argument raising by adding a specification to the lexical entries of auxiliaries which requires the arguments raised to be $\left[\text{LEX } \text{-}\right]$. As second thing, we need to add a second head-complement schema to the one introduced above for the flat approach to license the binary branching verbal complexes. So we define a variant of Hinrichs/Nakazawa's Verbal Complex ID Schema. Our second schema licenses binary branching head-complement constructions marked $\left[\text{LEX } +\right]$ whose head daughter is a *word* and whose complement daughter's head value is *verb*. Figure

[7] Cf., also Pollard and Moshier (1990, pp. 291f.) for a discussion to the end that empty constituents have no word order properties.

[8] Note that the original theory of Nerbonne (1994) also contains two head-complement schemata since he uses a special schema to license topicalized constituents.

2 in the appendix shows the structure of the PVP topicalization example (1b) as assigned by the modified Pollard theory with our two head-complement schemata. In this figure, the tree in which the auxiliary *können* combines with the trace is licensed by the binary head-complement schema.

Finally, to get a theory licensing a Kiss-style structure, we only need to specify two different head-complement schemata (replacing the two for Nerbonne and Hinrichs/Nakazawa): The verbal-complex schema licenses binary branching head-complement constructions marked [LEX -] whose complement daughter's is marked [LEX +] and its head value is *verb*. The second head-complement schema licenses constructions marked [LEX -] with a head daughter of type *word* and complement daughters marked [LEX -].[9]

Conclusion We have seen that the recent HPSG theories for PVP topicalization, Nerbonne (1994) and Hinrichs and Nakazawa (1994), contain much interesting discussion about the topic. However, some of the claims made do not go through. We have argued that regarding PVP topicalization 1. both a traceless and an analysis employing traces are equally possible, 2. there is no motivation for a nonmonotonic device to relax specifications, 3. there is no need for 'hand made' special purpose constituents, 4. the UDC mechanism does not need to be strengthened, 5. a flat structure without a verbal complex, a structure with a right-branching verbal complex and a structure with a left-branching verbal complex are equally possible.

Finally, we showed that the original HPSG proposal for PVP topicalization, Pollard (1990) only needs to be modified to enforce obligatory instead of optional argument raising to exclude the problematic spurious structures.

References

Chung, C. (1993). Korean auxiliary verb constructions without VP-nodes. In S. Kuno and al (Eds.), *Proceedings of the 1993 Workshop on Korean Linguistics*, Volume 5 of *Harvard Studies in Korean Linguistics*.

Hinrichs, E. W. and T. Nakazawa (1989). Flipped out: AUX in German. In *Proceedings of the 25th Annual Meeting of the Chicago Linguistic Society, Chicago, IL.*

Hinrichs, E. W. and T. Nakazawa (1994). Partial-VP and Split-NP topicalization in German - an HPSG analysis. In: Erhard W. Hinrichs, W. Detmar Meurers, and Tsuneko Nakazawa: *Partial-VP and Split-NP Topicalization in German – An HPSG Analysis and its Implementation.* Arbeitspapiere des SFB 340 Nr. 58, Universität Tübingen.

Kathol, A. (1995). *Linearization-Based German Syntax.* Ph. D. thesis, Ohio State University.

Kiss, T. (1992). *Infinite Komplementation: Neue Studien zum deutschen Verbum infinitum.* Ph. D. thesis, University of Wuppertal. Also published as Bericht Nr. 42 des SFB 282, Düsseldorf-Wuppertal.

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*, pp. 109–150. Stanford University: CSLI Publications. Lecture Notes 46.

Pollard, C. (1990). On head non-movement. In *Proceedings of the Tilburg Conference on Discontinuous Constituents.*

Pollard, C. and D. Moshier (1990). Unifying partial descriptions of sets. In P. Hanson (Ed.), *Information, Language and Cognition*, Volume 1 of *Vancouver Studies in Cognitive Science*, pp. 285–322. Vancouver: University of British Columbia Press.

Pollard, C. and I. A. Sag (1987). *Information-based Syntax and Semantics, Vol. 1.* Number 13 in Lecture Notes. Stanford University: CSLI Publications. Distributed by University of Chicago Press.

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

Rentier, G. M. (1994). A lexicalist approach to dutch cross serial dependencies. In *Papers from the 30th Regional Meeting of the Chicago Linguistic Society*, Volume 30, Chicago, Illinois. CLS: CLS.

[9] Instead of marking the complement daughters as [LEX -] in the schema, one could also do this in the finitivization lexical rule. Since the head-complement schema should probably serve other purposes than licensing finite sentences, this solution is probably preferable.

Appendix[10]

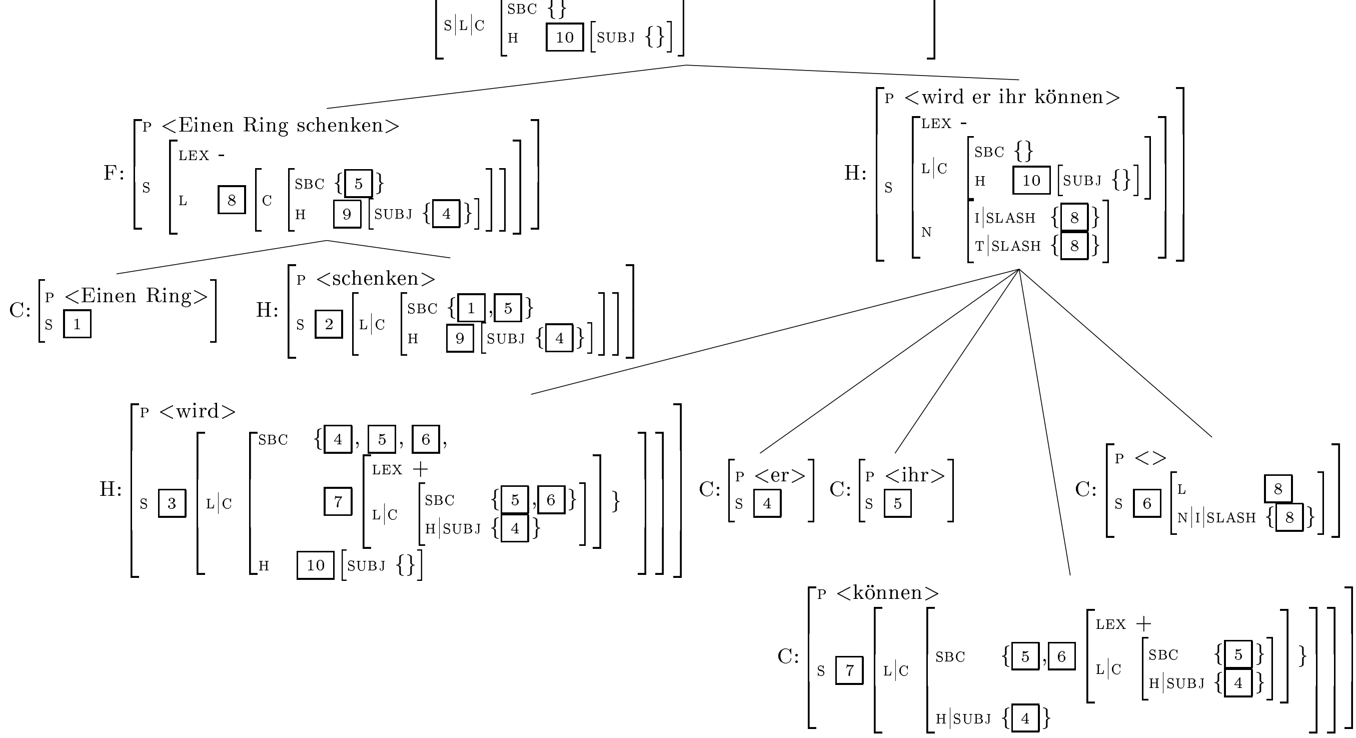

Figure 1: The Nerbonne-style structure for sentence (1b) as licensed by the first modified Pollard theory

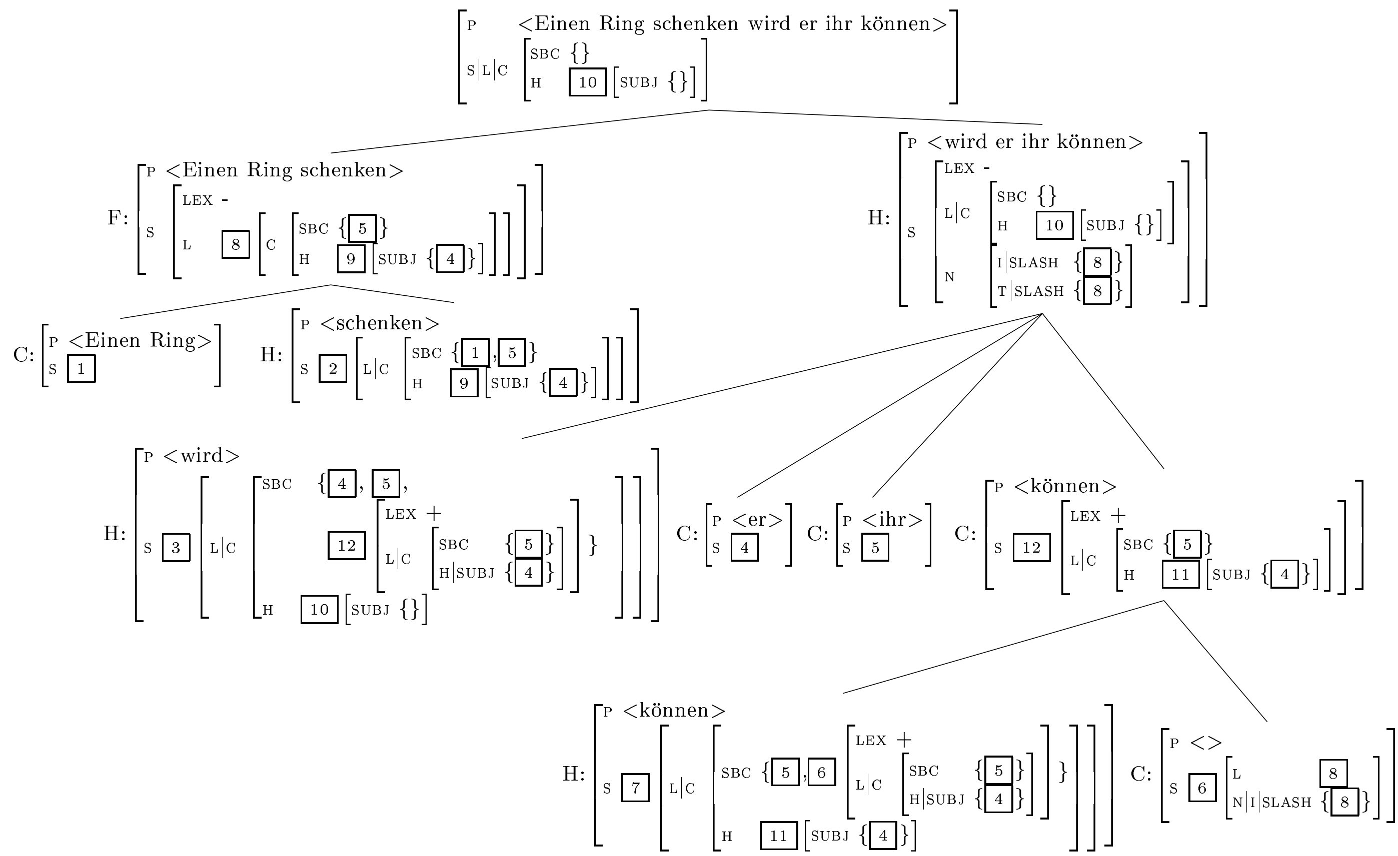

Figure 2: The Hinrichs/Nakazawa-style structure for sentence (1b) as licensed by the second modified Pollard theory

[10] For space reasons the following attributes are abbreviated by their initial letter: SYNSEM, LOCAL, NONLOCAL, INHERITED, TO-BIND, CAT. Additionally, SBC abbreviates SUBCAT. The labels H:, C:, and F: in front of the daughter AVMs show whether the Head-Dtr, a Complement-Dtr, or the Filler-Dtr is depicted.