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VP RELATIVES IN GERMAN

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Contents

1. Data Survey

Both German and English allow VPs to contain relative words (henceforth: VP relatives). For English such VP relatives seem to be limited to

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subject VPs, cf. the contrast between (1) and (2), while German allows both subject and non-subject VP relatives, as in (3) and (4), respectively.

(1) The elegant parties *to be admitted to one of which* was a privilege had usually been held at Delmonico's.
(example due to Nanni and Stillings, 1978)

(2) * I attended the elegant parties *to be invited to one of which* I had tried for many years.

(3) Das ist das Buch, *das zu lesen* ein reines Vergnügen war.
This is the book which to read a pure pleasure was
'This is the book which was a real pleasure to read.'

(4) Das ist das Buch, *das zu lesen* er seine Frau überredet hat.
This is the book which to read he his wife persuaded has
'This is the book which he persuaded his wife to read.'

A second difference between VP relatives in the two languages concerns the position of the relative pronoun inside the VP. In English, relative pronouns may occur *in situ* in complex relativized phrases such as *to be admitted to one of which* in (1). By contrast, relative words in German have to appear at the left periphery of the relativized phrase, as in (5), and may not be realized *in situ*, as the ungrammatical (6) shows.[1]

(5) Das ist das Buch, *das Peter zu überreden _ zu lesen* er sich geweigert hat.
that is the book which Peter to persuade to read he self refused has
'This is the book which he refused to persuade Peter to read.'

[1] In examples (5) and (6) the relative word appears as the leftmost word in the relative clause. However, if the relative word forms part of a PP, as in (i)

(i) Das ist das Buch über dessen Autor nichts bekannt ist.
That is the book about whose author nothing known ist.
'This is the book whose author nothing is known about.'

the preposition, e.g., *über* in (i), must precede the relative word, e.g., *dessen* in (i), since stranding of the preposition is prohibited in German relative clauses. Since the present paper focuses on VP relativization, rather than on relativized PPs, we will leave the precise characterization of what it means that the relative word has to appear at the left periphery to future research. However, see Müller (1999) for further details.

(6) * Das ist das Buch, *Peter zu überreden das zu lesen* er sich
that is the book Peter to persuade which to read he self
geweigert hat.
refused has

'(intended) This is the book which he refused to persuade Peter to read.'

The requirement that the relative pronoun appear at the left periphery of the relativized phrase is not restricted to relativized VPs in German. It holds for complex relativized NPs as well, as the contrast between (7) and (8) shows.

(7) Peter suchte den Jungen, *dessen Schwester* er kennt.
Peter searched the boy whose sister he knows

'Peter was looking for the boy whose sister he knows.'

(8) * Peter suchte den Jungen, *die Schwester von dem* er kennt.
Peter searched the boy the sister of whom he knows

'Peter was looking for the boy the sister of whom he knows.'

Another property that relativized NPs and VPs share is the fact that the distance between the relativized phrase and the head which subcategorizes for this phrase is in principle unbounded. This is shown in (9) and (10) for relativized NPs and VPs, respectively.

(9) a. Peter suchte das Buch, *das* Uwe behauptete _ zu lesen.
Peter searched the book which Uwe claimed to read.

'Peter looked for the book which Uwe claimed to read.'

b. Peter suchte das Buch, *das* Uwe behauptete Maria
Peter searched the book which Uwe claimed Maria
überzeugt zu haben _ zu lesen.
convinced to have to read.

'Peter looked for the book which Uwe claimed to have convinced Maria to read.'

(10) a. Das ist das Buch, *das* *zu lesen* er sich weigerte seiner
That is the book which to read he self refused his
Frau _ zu versprechen.
wife to promise.
'That is the book which he refused to promise his wife to read.'

b. Das ist das Buch, *das* *zu lesen* er sich weigerte zu
That is the book which to read he self refused to
versuchen seiner Frau _ zu versprechen.
try his wife to promise
'That is the book which he refused to try to promise his wife to read.'

As (10a) and (10b) show, the VP relative can be governed by a control verb that is embedded under an arbitrary number of other control verbs. VP relatives also exhibit a second type of unboundedness that pertains to the relativized VP itself.

(11) a. Das ist das Buch, *das* *Peter zu überreden _ zu lesen* er
that is the book which Peter to persuade to read he
sich geweigert hat.
self refused has
'This is the book which he refused to persuade Peter to read.'

b. Das ist das Buch, *das* *Maria zu versprechen Peter zu*
that is the book which Maria to promise Peter to
überreden _ zu lesen er sich geweigert hat.
persuade to read he self refused has
'This is the book which he refused to promise Maria to persuade Peter to read.'

The examples in (11) are meant to illustrate that the relative word *das* can be licensed by a verb that can appear at an arbitrary level of embedding under one or more control verbs within the relativized VP such as *überreden* in (11a), or *überreden* and *versprechen* in (11b).

At the same time, not all verbs that govern verbal complements allow VP relativization. Raising verbs such as *pflegen* or auxiliaries such as *können* do not license this construction, as (12) and (13) show.

(12) * Das ist das Buch, *das* *zu lesen* er pflegte.
that is the book which to read he used to
'(intended) That is the book which he used to read.'

(13) * Das ist das Buch, *das* *lesen* er kann.
that is the book which read he can
'(intended) That is the book which he can read.'

In the following sections we will provide an HPSG analysis that will account for the range of facts that we have just outlined.

2. Subcategorization Frames for Different Verb Classes

Our analysis of German VP relatives is based on the constituent structures proposed by Hinrichs and Nakazawa (1998) for verbs of German that govern verbal complements. In this earlier work we assume that among verbs which govern the *zu*-infinitive, some, e.g. *sich weigern*, subcategorize for VPs, as shown in the lexical entry (14), while others, e.g. *pflegen* do not. Instead, as shown in lexical entry (15), verbs such as *pflegen* raise the arguments of the *zu*-infinitive it governs by the operation of *argument composition*.

(14)
$$\begin{bmatrix} \textit{word} \\ \text{PHON} < \textit{weigerte} > \\ \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \begin{bmatrix} \text{HEAD } \textit{verb} \\ \text{VAL} \mid \text{COMPS } \langle \text{ NP, NP, VP } \rangle \end{bmatrix} \end{bmatrix}$$

(15)
$$\begin{bmatrix} \textit{word} \\ \text{PHON} < \textit{pflegte} > \\ \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \begin{bmatrix} \text{HEAD } \textit{verb} \\ \text{VAL} \mid \text{COMPS } \textit{(}\ \langle \textit{ NP } \rangle \oplus \boxed{1} \oplus \\ \qquad \langle \begin{bmatrix} \text{LOC} \mid \text{CAT} \begin{bmatrix} \text{HEAD } \textit{verb} \\ \text{VAL} \mid \text{COMPS } \boxed{1} \end{bmatrix} \end{bmatrix} \rangle\ \textit{)} \end{bmatrix} \end{bmatrix}$$

As a result, *sich weigern* takes a VP complement such as *das Buch zu lesen* in (16). A verb like *pflegen*, on the other hand, forms a verbal complex with *zu lesen*, as shown in (17), while the NP complement *das Buch* is raised outside this verbal complex.[2]

[2]The alert reader may wonder whether the structure in (17) is the only one admitted. It appears that nothing in the lexical entry in (15) requires that argument raising

(16) daß er [das Buch zu lesen] sich weigerte.
that he the book to read self refused
'... that he refused to read the book.'

(17) daß er das Buch [zu lesen pflegte].
that he the book to read used to
'... that he used to read the book.'

As we discussed in the previous section, the two classes of verbs that govern verbal complements also show characteristically different behavior with respect to VP relativization.

(18) Das ist das Buch, *das zu lesen* er sich weigerte.
That is the book which to read he self refused
'That is the book which he refused to promise his wife to read.'

(19) * Das ist das Buch, *das zu lesen* er pflegte.
that is the book which to read he used to
'(intended) That is the book which he used to read.'

The ungrammaticality of (19) provides independent evidence for the constituent structures assumed by Hinrichs and Nakazawa (1998), since *das zu lesen* does not form a VP. In fact, as Bech (1955) was the first to point out, whether or not a particular verb can license VP relatives correlates with a number of other syntactic properties such as VP extraposition, auxiliary fronting, and scrambling.

3. VP Relatives: Extraction or Scrambling

Previous analyses of VP relativization in the GB framework have assumed either a movement analysis of this construction (Riemsdijk, 1985; Grewendorf, 1986, 1989) or have tried to account for the relevant data in terms of scrambling (Haider, 1985). In Haider's account, the VP relative *das zu lesen* in (20) is ordered as the leftmost element among all the complements of *weigern*.

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is obligatory. The obligatory nature of argument raising can be enforced by the interaction between the feature NPCOMP, which signals whether a verbal element has combined with any of its (nominal) complements and which marks the verbal complements of auxiliaries, and the ID rule that licenses the verbal complex. We refer interested readers to Hinrichs and Nakazawa (1994a, 1998) for further details.

(20) Das ist das Buch, *das zu lesen* er sich weigerte.
That is the book which to read he self refused
'That is the book which he refused to read.'

As already noted by Grewendorf, a scrambling analysis cannot adequately account for the full range of data. In particular it fails with respect to examples such as (21) in which a VP is relativized that is embedded inside the VP complement of a control verb such as *sich weigern*.

(21) Das ist das Buch, *das zu lesen* er sich weigerte seiner Frau _
That is the book which to read he self refused his wife
zu versprechen.
to promise.
'That is the book which he refused to promise his wife to read.'

(21) offers strong evidence against a scrambling analysis of VP relatives proposed by Haider (1985). (21) demonstrates that VP relatives instead involve genuine extraction. Coordination data, although not the most reliable test for constituenthood, provide additional support that the relative clause forms a constituent without a relativized VP, i.e., a fact which could not be accounted for if the relativized VP were not extracted out of the clause. The following example is taken from Grewendorf (1986).

(22) ein Mann, *mit dem zu argumentieren* Peter versuchte und
a man with whom to argue Peter tried and
Hans ablehnte
Hans refused
'a man with whom Peter tried to argue and Hans refused (to argue)'

Our analysis of German VP relatives will posit two filler-head rules: the Filler-Head Relative Clause ID Rule, which licenses extraction of relative phrases as such, and the Filler-Head Relative VP ID Rule, which is responsible for the internal extraction of relative pronouns within relativized

VPs.[3] The interaction between these two ID-rules, which we will introduce shortly, is illustrated in the tree for example (5) shown in Figure 1.[4]

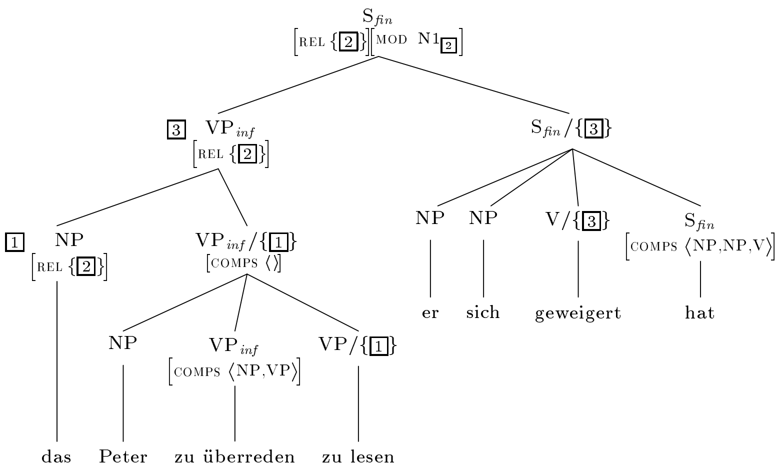

FIGURE 1. tree for relative clause in (5)

In Figure 2 the relative pronoun *das* is licensed within the VP as a filler by the Filler-Head Relative VP ID rule shown in Figure 3. The VP complement of *geweigert* is extracted and licensed by the Filler-Head Relative Clause ID Rule shown in Figure 2.[5]

The feature REL on the filler is specified as a singleton set. We assume that at the word level non-empty REL sets are introduced only by relative

[3]Just before this volume went to press, we became aware of an HPSG analysis of the same construction by De Kuthy (1999), which was developed independently of the account presented here. De Kuthy also argues for a double-extraction account and sketches how such an account can be rendered in the construction-type approach to the syntax of relative clauses proposed by Sag (1997).

[4]We assume that the possible values for the feature VFORM for German include *bse*, *inf*, and *psp*. They are meant to differentiate among bare infinitives such as *kaufen*, infinitives marked by *zu* such as *zu kaufen*, and past participles such as *gekauft*, respectively. The three values also correspond to the three STATUS of verbs identified by Bech (1955).

[5]The rule in Figure 2 is modelled after the relative clause rule proposed for English by Sag (1997).

$$
\left[\textit{phrase}\right] \rightarrow \quad \mathrm{F}\left[\text{SYNSEM}\left[\begin{array}{ll}\text{LOC }\boxed{1}\mid\text{CAT} & \left[\begin{array}{ll}\text{HEAD} & (\textit{noun} \vee \\ & \textit{prep} \vee \\ & \left[\begin{array}{ll}\textit{verb} & \\ \text{VFORM} & \textit{inf}\end{array}\right])\\ \text{VAL} & \left[\begin{array}{ll}\text{COMPS} & \langle\rangle\\ \text{SPR} & \langle\rangle\end{array}\right]\end{array}\right]\\ \text{NONLOC}\mid\text{INHER} & \left[\begin{array}{ll}\text{SLASH} & \{\}\\ \text{REL} & \{\boxed{2}\}\end{array}\right]\end{array}\right]\right],
$$

$$
\mathrm{H}\left[\text{SYNSEM}\left[\begin{array}{ll}\text{LOC}\mid\text{CAT} & \left[\begin{array}{ll}\text{HEAD} & \left[\begin{array}{ll}\textit{verb} & \\ \text{VFORM} & \textit{fin}\\ \text{MOD} & \mathrm{N1}_{\boxed{2}}\end{array}\right]\\ \text{VAL} & \left[\begin{array}{ll}\text{COMPS} & \langle\rangle\\ \text{SUBJ} & \langle\rangle\\ \text{SPR} & \langle\rangle\end{array}\right]\end{array}\right]\\ \text{NONLOC} & \left[\begin{array}{ll}\text{INHER} & \left[\begin{array}{ll}\text{SLASH} & \{\boxed{1}\}\\ \text{REL} & \{\}\end{array}\right]\\ \text{TO-BIND} & \left[\begin{array}{ll}\text{SLASH} & \{\boxed{1}\}\\ \text{REL} & \{\}\end{array}\right]\end{array}\right]\end{array}\right]\right]
$$

FIGURE 2. Filler-Head Relative Clause ID Rule

pronouns. Thus, the filler has to contain exactly one relative pronoun, while the head clause contains none as indicated by the empty REL value. In order to prevent the value of the non-local feature SLASH from percolating to the mother category of the rule, the value has to appear under the feature TO-BIND of the head. The Nonlocal Feature Principle of Pollard and Sag (1994) will then ensure that the SLASH value on the mother category is the empty set. The empty specification of the SLASH value disallows extraction out of relative clauses, as in the ungrammatical example (23).

(23)	* Wen	ist	das	das	Buch,	*das*	*zu*	*lesen*	er	_ _	überredet	hat?
	who	is	this	the	book	which	to	read	he		persuaded	has

In addition, the rule in Figure 2 restricts the head to projections of finite verbs which carry the feature MOD. Following Sag (1997) we assume that lexical heads of relative clauses carry the feature MOD which specifies the syntactic category that the relative clause modifies. Reentrancy $\boxed{2}$ ensures that the REL and MOD value share the same index. Since REL is a non-local feature and MOD is a head feature, this index will also be instantiated on the REL and MOD values of the mother category of any local tree licensed by the rule.

The syntactic category of the filler is restricted to NPs, PPs and infinitival VPs. The set of categories that can appear as fillers in a relative clause is, of course, language specific. For German infinitival VPs have to be included, while for English we assume, following Bresnan (1976) and Sag (1997), that relative clause fillers are restricted to NPs and PPs.

The second filler-head rule that is presupposed in the tree in Figure 1 is given in Figure 3 and licenses a relativized VP. Either an NP or a PP is extracted inside of a relativized infinitival VPs, as the relative pronoun *das* is extracted out of *Peter zu überreden zu lesen* in the tree in Figure 1.

$$
\begin{bmatrix} \textit{phrase} \end{bmatrix} \rightarrow
\begin{array}{ll}
\mathrm{F} & \begin{bmatrix} \textsc{synsem} & \begin{bmatrix} \textsc{loc}\ \boxed{1} \mid \textsc{cat} & \begin{bmatrix} \textsc{head} & (\textit{noun} \vee \textit{prep}\,) \\ \textsc{val} & \begin{bmatrix} \textsc{comps} & \langle\rangle \\ \textsc{subj} & \langle\rangle \\ \textsc{spr} & \langle\rangle \end{bmatrix} \end{bmatrix} \\ \textsc{nonloc} \mid \textsc{inher} \mid \textsc{rel} & \neg\{\} \end{bmatrix} \end{bmatrix}, \\
\mathrm{H} & \begin{bmatrix} \textsc{synsem} & \begin{bmatrix} \textsc{loc} \mid \textsc{cat} & \begin{bmatrix} \textsc{head} & \begin{bmatrix} \textit{verb} & \\ \textsc{vform} & \textit{inf} \\ \textsc{mod} & \textit{none} \end{bmatrix} \\ \textsc{val} & \begin{bmatrix} \textsc{comps} & \langle\rangle \\ \textsc{subj} & \langle \textit{NP} \rangle \\ \textsc{spr} & \langle\rangle \end{bmatrix} \end{bmatrix} \\ \textsc{nonloc} & \begin{bmatrix} \textsc{inher} & \begin{bmatrix} \textsc{slash} & \left\{\boxed{1}\right\} \\ \textsc{rel} & \{\} \end{bmatrix} \\ \textsc{to-bind} & \begin{bmatrix} \textsc{slash} & \left\{\boxed{1}\right\} \\ \textsc{rel} & \{\} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}
\end{array}
$$

FIGURE 3. Filler-Head Relative VP ID Rule

Note that the restriction of the HEAD in Figure 3 to non-finite VPs is crucial to prevent undesirable interactions with the Filler-Head Relative Clause ID Rule in Figure 2. Due to the restriction to non-finite verbal head in Figure 3, the rule can only apply to the filler phrase in Figure 2, but crucially not to the verbal head of Figure 2. Conversely, the ID rule in Figure 2 cannot apply to the phrasal head in Figure 3 since their VFORM specifications clash. Therefore, the only purpose that the ID rule in Figure 3 can serve is to extract an NP or a PP within a relativized VP. The *none* value of MOD on the head, and hence on the mother, indicates that the relativized VP alone cannot modify a head noun unless it is embedded as a filler in a relative clause headed by a finite verb.[6] Thus, the *none* value of MOD can successfully block ungrammatical sentences such as (24).

(24) * Das ist das Buch, das zu lesen.
that is the book which to read

As is the case for the other filler-head ID rule in Figure 2, the REL value of the filler is specified to be non-empty in the Filler-Head Relative VP ID Rule in Figure 3. Unlike the previous rule, however, this REL value is not bound by the head. Due to the Nonlocal Feature Principle, the REL value of the filler will be identified with that of the mother, thus marking the entire infinitival VP with a non-empty REL value.

Finally, we need to introduce one more ID rule that lets us expand filler and head of the relative clause. The Head-Complement ID Rule that we will adopt for this purpose is taken from Hinrichs and Nakazawa (1994b) and is slightly modified in Figure 4.

$$\left[\text{SYNSEM}\left[\begin{array}{l}\text{LOC}\mid\text{CAT}\left[\begin{array}{l}\text{HEAD } \textit{verb}\\ \text{VAL}\mid\text{COMPS}\ \langle\rangle\end{array}\right]\\ \text{NONLOC}\mid\text{INHER}\mid\text{REL}\ \{\}\end{array}\right]\right] \rightarrow \text{C*, H}_{word}$$

FIGURE 4. Head-Complement ID Rule

The ID rule discharges all of the complements of a verbal head in a flat structure. Since the rule does not require a particular value for VFORM, the rule is meant to be used for finite and non-finite verbal phrases alike. The empty REL value of the mother has the effect of disallowing a relativized phrase to remain *in situ* in finite clauses and a relative pronoun to remain unextracted within a fronted infinitival VP.

(25) * Das ist das Buch, Peter zu überreden *das zu lesen* er sich
that is the book Peter to persuade which to read he self
geweigert hat.
refused has
'(intended) This is the book which he refused to persuade Peter to read.'

[6] We are indebted to an anonymous referee for this idea.

Ungrammatical sentences such as (25) can be ruled out since the unextracted VP *das zu lesen* contains a relative word and hence has to be dominated by a phrasal node whose REL value is non-empty. The Head-Complement ID Rule is therefore not applicable, and the sentence is successfully blocked.

It might seem that the analysis presented above introduces a structural ambiguity when a relative pronoun is not an embedded object, as is the case in Figure 1, but rather the highest object NP of the relativized VP such as *das zu lesen* in example (4). Although the linear order of the relativized VP may be generated with or without extraction of the relative pronoun, there is no independent syntactic or semantic motivation to support such an ambiguity. Instead, the ID rules proposed above analyze the relative clause in (4) as a case of double extraction and assign an unambiguous structure similar to that in Figure 1, schematically given in (26).

(26) [das [_ zu lesen]] er seine Frau _ überredet hat

If the relativized VP *das zu lesen* were licensed without extraction of *das* within the VP, it would have to be licensed by the Head-Complement ID Rule in Figure 4 rather than by the Filler-Head Relative VP ID Rule in Figure 3. However, the Head-Complement ID Rule requires the REL value of the licensed constituent to be empty, i.e., specifies the constituent to contain no relative words. Hence, this requirement would clash with the fact that a non-empty REL value would have to percolate from *das* to the node that dominates the relativized VP.

To complete the analysis, we introduce the Head-Adjunct ID Rule in Figure 5 which allows us to combine relative clauses with the nominal heads they modify.

Although the analysis of head-adjunct constructions is fairly disjoint with the analysis of the internal structure of relative clauses themselves, a few points merit mentioning. As is the case in the Head-Adjunct ID Rule proposed in Pollard and Sag (1994), our Head-Adjunct ID Rule ensures that the INDEX value of the nominal head is identical to that of the MOD value of the adjunct, i.e., a relative clause. This interaction between the values for MOD and INDEX is illustrated in the tree in Figure 6 for example (18) by tag $\boxed{2}$. Furthermore, the index of the MOD value is required to be identical to the REL value of the adjunct. Since this REL value originates from the relative pronoun contained in the adjunct, the

$$
\begin{bmatrix}\textsc{synsem}\mid\textsc{loc}\mid\textsc{cont}\begin{bmatrix}\textsc{index}\ \boxed{2}\\ \textsc{rest}\ \boxed{3}\cup\left\{\boxed{4}\right\}\end{bmatrix}\end{bmatrix}\rightarrow
$$

$$
\mathrm{H}\begin{bmatrix}\textsc{synsem}\ \boxed{1}\begin{bmatrix}\textsc{loc}\begin{bmatrix}\textsc{cat}\mid\textsc{head}\ \ \textit{noun}\\ \textsc{cont}\begin{bmatrix}\textsc{index}\ \boxed{2}\\ \textsc{rest}\ \boxed{3}\end{bmatrix}\end{bmatrix}\\ \textsc{nonloc}\mid\textsc{to-bind}\begin{bmatrix}\textsc{slash}\ \{\}\\ \textsc{rel}\ \left\{\boxed{2}\right\}\end{bmatrix}\end{bmatrix}\end{bmatrix},
$$

$$
\mathrm{A}\begin{bmatrix}\textsc{synsem}\begin{bmatrix}\textsc{loc}\begin{bmatrix}\textsc{cat}\mid\textsc{head}\begin{bmatrix}\textit{verb}\\ \textsc{mod}\ \boxed{1}\end{bmatrix}\\ \textsc{cont}\ \ \boxed{4}\end{bmatrix}\\ \textsc{nonloc}\mid\textsc{inher}\begin{bmatrix}\textsc{slash}\ \{\}\\ \textsc{rel}\ \left\{\boxed{2}\right\}\end{bmatrix}\end{bmatrix}\end{bmatrix}
$$

FIGURE 5. Head-Adjunct ID Rule

nominal head and the relative pronoun must share the same INDEX value, as shown in Figure 6. Finally, the REL value of the adjunct is bound by the TO-BIND feature of the head so that it cannot percolate up beyond the scope of the relative clause.

Following Sag (1997), our Head-Adjunct ID Rule further stipulates that the CONT value of the relative clause is included as an additional member in the RESTRICTION set of the mother. This stipulation makes it possible to treat the CONT value of the relative clause in the same way as the semantics of other verbal projections. It also marks the main difference to the relative clause analysis by Pollard and Sag (1994), who introduce an empty relativizer which assimilated the CONT of the relative clause to the CONT specification appropriate for nominal projections.

Since neither Sag's analysis for English, nor the one we propose for German employs an empty relativizer, which incorporates the CONT of the relative clause into the CONT specification of the nominal head, the Head-Adjunct ID Rule has to take over this task. This has the further consequence that we cannot adopt the Semantics Principle of Pollard and Sag (1994), which states that the semantic head, i.e., the relative clause in this case, has to share its CONT value with that of the mother. However, since the definition of semantic head in the Semantics Principle of Pollard and Sag (1994) is highly disjunctive to begin with, having to stipulate semantic composition on each ID-rule seems a much lower cost to pay than

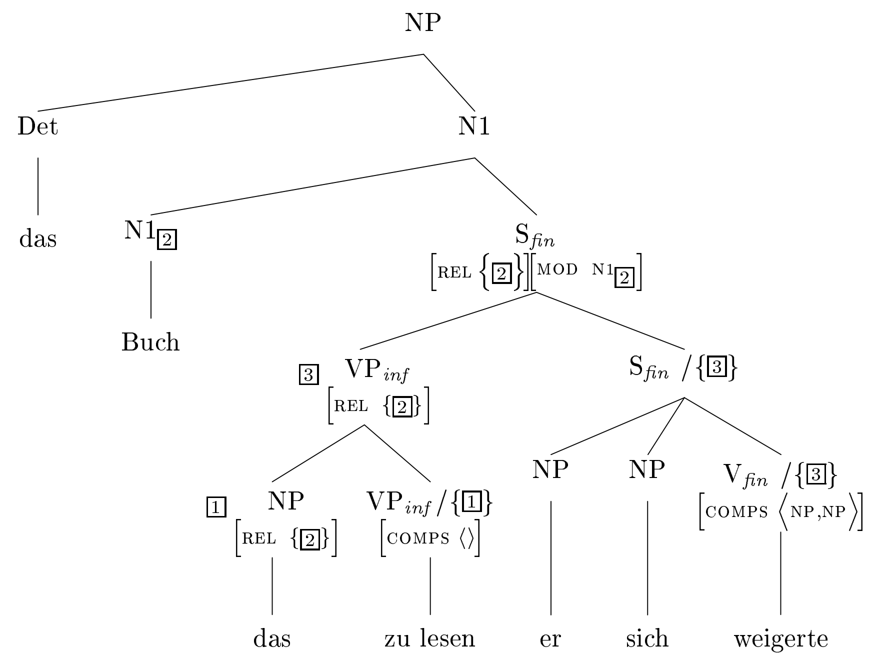

FIGURE 6. tree for relative clause in (18)

having to adopt an empty relativizer whose only purpose is to assimilate the semantics of relative clauses to a nominal-type semantics.[7]

4. Subject Relatives

So far we have only considered the structures that our account assigns to VP relatives that are subcategorized objects. We will now return to relativized subject VPs, as in (3), repeated below as (27).

(27) Das ist das Buch, *das zu lesen* ein reines Vergnügen war.
This is the book which to read a pure pleasure was
'This is the book which was a real pleasure to read.'

[7]One way to maintain some version of the Semantics Principle and at the same time adopt an analysis in which relative clauses are assigned CONT specifications that are appropriate for verbal projections, is to adopt a Bach-Cooper-style analysis of relative clauses (Bach and Cooper, 1978). In their analysis, relative clauses modify NPs rather than N1s, and the NP functions as the semantic head.

As we discussed in section 3, the distance between a relativized object VP and the head which subcategorizes for this phrase is in principle unbounded. This unboundedness then leads us to propose an extraction analysis of VP relatives. However, the question arises whether subject VP relatives also require extraction, or whether they should be licensed *in situ* by the Head-Complement ID Rule. Such an *in-situ* analysis of subject VP relatives has been proposed for English by Sag (1997) to account for the subject/object asymmetry that we noted in section 1 (cf. examples 1 and 2). Sag assumes that relative clauses in which a non-subject phrase is relativized involve extraction while subject relatives do not. Following Bresnan (1976), Sag limits extraction of relativized constituents to NPs and PPs. Thus, non-subject VP relatives are ruled out, while VP subject relatives are admitted because only the former involves extraction. Since German allows non-subject VP relatives, the language-specific restriction for English which limits fillers to NPs and PPs cannot be upheld for German. However, the question remains whether an *in-situ* analysis of subject VP relatives can be adopted for German as well.

Crucial evidence against an *in-situ* analysis of relativized subject VPs can be derived from scrambling data. In German, complement phrases, including subjects, which precede verbal elements in a clause may be reordered among themselves due to various pragmatic factors (see, e.g., Uszkoreit (1987) for details). The relativized subject phrase, however, may not participate in this type of complement scrambling, as (28), which is taken from Grewendorf (1989), shows. (28a) is an example where the embedded object of the subject VP *das zu beleidigen* is relativized.

(28) a. ein Mädchen, *das* *zu beleidigen* Hans gestört hat
a girl whom to offend Hans bothered has
'a girl whom to offend bothered Hans'

b. * ein Mädchen, *das* Hans *zu beleidigen* gestört hat
a girl whom Hans to offend bothered has

If it were merely the relative pronoun which is extracted while the subject VP remains in the clause, then nothing would prevent the rest of the subject VP from being scrambled with other complements, as shown in (28b). The ungrammaticality of (28b) thus provides strong evidence for an extraction analysis of subject VP relatives.

In our characterization of (28) we have tacitly assumed that the relative pronoun *das* is extracted within the relativized subject VP. That such

VP-internal extraction is, in fact, required, is due to the unbounded distance between relative pronouns and their subcategorizing heads which subject VPs exhibit in the same way as object VPs, cf. (29a) and (29b), respectively.

(29) a. Das ist das Buch, *das* *Peter zu empfehlen* _ *zu lesen* ein
that is the book which Peter to recommend to read a
Vergnügen war.
pleasure was

'This is the book which was a pleasure to recommend to Peter to read.'

b. Das ist das Buch, *das* *Peter zu überreden* _ *zu lesen* er
that is the book which Peter to persuade to read he
sich geweigert hat.
self refused has

'This is the book which he refused to persuade Peter to read.'

Thus, subject VP relatives require extraction of the entire VP and VP-internal extraction of the relative pronoun in the same way as object VP relatives. In fact, the ID rules that we have introduced in the previous sections interact in such a way that this two-fold extraction is applicable to subject relatives as well. The extraction of subjects and objects is licensed by the Complement Extraction Lexical Rule in Figure 7 which eliminates a member of the COMPS list and places it on a SLASH set.

$$\left[\text{SYNSEM}\ \left[\text{LOC}\ \left[\begin{array}{l}\text{CAT}\mid\text{VAL}\mid\text{COMPS}\ \langle \ldots, \boxed{1}\left[\textit{phrase}\right], \ldots \rangle \\ \text{NONLOC}\mid\text{INHER}\mid\text{SLASH}\ \boxed{2}\end{array}\right]\right]\right] \mapsto$$

$$\left[\text{SYNSEM}\ \left[\text{LOC}\ \left[\begin{array}{l}\text{CAT}\mid\text{VAL}\mid\text{COMPS}\ \langle \ldots \rangle \\ \text{NONLOC}\mid\text{INHER}\mid\text{SLASH}\ \boxed{2} \cup \left\{\boxed{1}\right\}\end{array}\right]\right]\right]$$

FIGURE 7. Complement Extraction Lexical Rule

Following Borsley (1987), the COMPS list is assumed to include all non-subject complements of infinitival verbs while it also contains the subject if the input to the lexical rule is a finite verb. Therefore the same extraction lexical rule suffices for both extraction of a subject and an object. It is also this lexical rule which is responsible for the extraction of a relative pronoun within the relativized infinitival VP. It should be noted that this extraction lexical rule is independently motivated in previous analyses of German such as Pollard (1996), Nerbonne (1994), and Hinrichs and Nakazawa (1994b) for the topicalization construction, i.e., verb-second clauses, where either a subject or an object is fronted to the left of a finite verb.

The Complement Extraction Lexical Rule together with the ID rules given before assigns the constituent structure in Figure 8 to the subject relative in (28a). The subject VP *das zu beleidigen* is extracted and the relative pronoun *das* is also extracted within the subject VP.

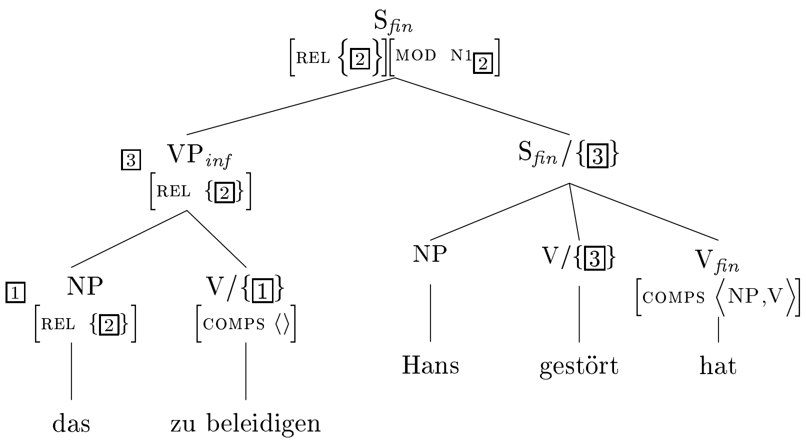

FIGURE 8. tree for relative clause in (28a)

The top local tree is licensed by the Filler-Head Relative Clause ID Rule in Figure 2; the filler VP is licensed by the Filler-Head Relative VP ID Rule in Figure 3; and the head of the clause is licensed by the Head-Complement ID Rule in Figure 4. The structure is similar to the one for the object relative in Figure 1. The only difference is that the object VP is relativized in Figure 1 while it is the subject VP that is relativized in Figure 8. The REL specifications of the ID rules prevent structural ambiguity of subject relatives in a similar fashion to that of object relatives. If the relativized subject VP remained *in situ* in the clause, the clause would have to be licensed by the Head-Complement ID Rule in Figure 4 rather than by the Filler-Head Relative Clause ID Rule in Figure 2. However, such a subject contains a relative pronoun, regardless of whether this pronoun is fronted within the subject, and is marked by a non-empty REL value, resulting in a conflict with the empty REL specification of the mother of the ID rule. If the relative pronoun were not extracted within the subject VP, the subject VP would have to be licensed by the Head-Complement ID Rule in Figure 4 instead of the Filler-Head Relative VP ID Rule in Figure 3. This would result in a similar REL value clash since the subject VP contains a relative pronoun.

5. Further Issues

In Section 1.3, we demonstrated that our Head-Complement ID Rule does not allow the possibility of an unmotivated structure in which a relative pronoun is not extracted within a relativized VP. Instead, the relative pronoun is forced to be extracted even when it is the leftmost NP within the relativized VP as schematically shown in (26).

However, there is another source of structural ambiguity. Namely, if a subject or object VP is realized as the leftmost constituent in the Mittelfeld, then either the entire VP can be extracted, or only a relative pronoun can be extracted from this VP. For example, for the relative clause in (28a), repeated below as (30), our analysis admits the double-extraction structure shown in the tree in Figure 8 above, but in addition also the structure in Figure 9.

(30) ein Mädchen, *das* *zu beleidigen* Hans gestört hat
a girl whom to offend Hans bothered has
'a girl whom to offend bothered Hans'

In Figure 9 the relative pronoun has been extracted out of the lower finite clause, i.e., the lower S_{fin}, instead of the VP *zu beleidigen*. This structure is possible since the Complement Extraction Lexical Rule in Figure 7 can extract the embedded object of the subject VP, and this object can be licensed as a filler by the Filler-Head Relative Clause ID Rule in Figure 2.

Since the two syntactic structures do not correlate with distinct semantic interpretations, there is no independent, semantic evidence in favor of two distinct syntactic analyses. Rather, the licensing of the two structures is a reflection of two possible realizations of relative phrases in German: as a VP or as an NP as demonstrated in (9) and (10) respectively. However, where extraction of an NP or a VP results in no difference of linear order of strings, as in (30), we are not aware of any syntactic evidence that would favor one structure or the other.

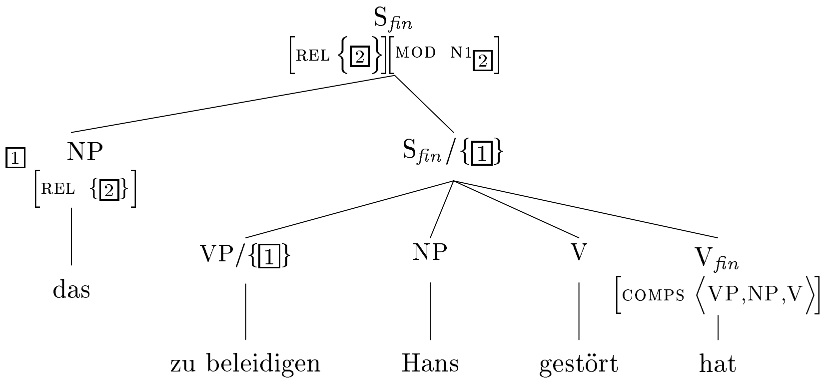

FIGURE 9. alternative tree for the relative clause in (30)

6. Conclusion

In this paper we have argued that VP relatives in German involve two types of extraction: extraction of the entire relativized VP and extraction of the relative pronoun within the extracted VP. Accordingly, our analysis of German VP relatives posits two filler-head rules: the Filler-Head Relative Clause ID Rule, which licenses extraction of relativized VPs, and the Filler-Head Relative VP ID Rule, which is responsible for the internal extraction of relative pronouns within the VP. We have demonstrated that subject VP relatives require double extraction in the same way object VP relatives do and that the proposed filler-head ID rules are applicable to both types of VP relatives.

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