

# Case Matching in Bavarian Relative Clauses: A declarative, non-derivational Account\*

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## 1 Introduction

Matching effects in German VP coordination and German free relatives, as in (1) and (2), have been discussed for quite some time, going back at least to Groos and van Riemsdijk (1981), as interesting phenomena for linguistic theorizing. More specifically, Ingria (1990) was the first to identify them as potential challenges to constraint-based and unification-based approaches to syntax such as HPSG and LFG.

- (1) a. Hans hilft und unterstützt Frauen.  
Hans helps and supports women (dat/acc)  
'Hans helps and supports women.'
- b. \*Hans hilft und unterstützt Männern/Männer.  
Hans helps and supports men (dat)/men (acc)  
'(intended) Hans helps and supports men.'
- (2) a. Was Du mir gegeben hast ist prächtig.  
What (nom/acc) you me given have is wonderful  
'What you have given to me is wonderful.'
- b. \*Ich nehme wen/wem Du vertraust.  
I take who (acc)/who (dat) you trust  
'(intended) I take whomever you trust.'

The transitive verb *hilft* in (1) subcategorizes for a dative NP and is conjoined with the transitive verb *unterstützen* that requires an accusative object. This coordination of unlike verbs does not lead to ungrammaticality as long as the NPs in question exhibit the same morphology (e.g. *Frauen* in (1a) is the plural form for both dative and accusative case). However, for masculine gender no such morphological match exists. Therefore, (1b) is ungrammatical.

Free relatives as in (2) exhibit the same pattern. In (2a), the *w*-pronoun *was*, which is the same for nominative and accusative case, can play double duty: it can fulfill the accusative requirement inside the free relative and the nominative requirement for the matrix clause. By contrast, in (2b) *nehmen* subcategorizes for an accusative object, while *vertrauen* requires a dative object. Since there is no identity in form between the dative *w*-pronoun *wem* and the accusative *w*-pronoun *wen*, (2b) is ungrammatical.

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The grammaticality of examples such as (1a) and (2a) are taken to pose a challenge to constraint-based or unification-based approaches to syntax. The reason is that such theories typically rely on identity constraints or structure sharing to enforce likeness of categories. However, the NP *Frauen* and the relative pronoun structurally seem to have to play a double role. They have to be viewed as exhibiting distinct case values. Since assignment of values to features is taken to be functional, examples such as (1) and (2) seem to test the limits of unification, as Ingria (1990) claims. A possible way out of the dilemma is to assume a subsumption check for the cases in question rather than unification or feature identity.

The goal of this paper is to consider yet another construction, this time relative clauses in Bavarian dialects of German, in which morphological matching plays a crucial role. At first glance Bavarian relative clauses, which were first discussed by Bayer (1984), seem to require similar analytical tools as those suggested by Ingria (1990) and by Bayer and Johnson (1995). However, as we will argue, a closer look at the full set of data reveals that the analytical tools provided by unification-based or constraint-based grammar formalisms fully suffice to give a completely declarative analysis of the data.

## 2 Bavarian relative clauses – the data

In Bavarian relative clauses, relative pronouns appear together with the complementizer *wo* as shown in (3). While the complementizer *wo* is invariant in form, the relative pronoun is inflected for number, case, and gender: *den* in (3a) and (3b) is masculine, accusative, singular; *dem* in (3c) is masculine, dative, singular.

- (3) a. Der Mantl \*(den) wo i kaffd hob wor z'rissen.  
the coat (nom) which (acc) that I bought have was torn  
'The coat which I bought was torn.'
- b. Mir meng den Mantl (den) wo i kaffd hob.  
we like the coat (acc) which (acc) that I bought have  
'We like the coat which I bought.'
- c. Sie gem's dem Mo (dem) wo mir g'hoifa hom.  
they give it the man (dat) who (dat) that we helped have  
'They gave it to the man who we helped.'

In some, but not all, cases the presence of the relative pronoun is optional. In particular, the relative pronoun can be omitted if its syntactic case matches that of the head noun, as in (3b) and (3c). If the case of the head noun does not match that of the relative pronoun, as in (3a), then the presence of the relative pronoun seems obligatory.

However, as the data in (4) show, presence of the relative pronoun is not always required, even if the case of the head noun does not match that of the relative pronoun.

- (4) a. I sog's dem Mo (der) wo im Gartn arwat.  
I say-it the man (dat) who (nom) that in-the garden works  
'I'll tell it to the man who works in the garden.'
- b. I gib's dera Frau (die) wo d'Muich bringd.  
I give-it the woman (dat) who (nom) that the-milk brings  
'I give it to the woman who brings the milk.'
- c. I schenk's dem Kind (des) wo mid da Katz spuid.  
I give-it the child (dat) who (nom) that with the cat plays  
'I give it to the child who plays with the cat.'

All examples in (4) are grammatical and exhibit a case mismatch between the head noun and the relative pronoun. What seems to be going on here, as Bayer (1984) already

observed, is that relative pronouns in nominative case are exempt from the case matching requirement otherwise necessary for relative pronoun omission.

It turns out that relative pronouns can be omitted not only if they are assigned nominative case by the governing verb of the relative clause, but also if they are assigned a case other than nominative, as long as the form of the relative pronoun is identical to the respective nominative case. Examples (5) illustrate this phenomenon.

- (5) a. Der Mantl \*(den) wo i kaffd hob wor z'rissen.  
 the coat (nom) which (acc) that I bought have was torn  
 'The coat which I bought was torn.'
- b. Die Lampn (die) wo i g'seng hob wor greißlich.  
 the lamp (nom) which (acc) that I seen have was ugly  
 'The lamp that I saw was ugly.'

While the masculine accusative pronoun *den* is obligatory in (5a), the feminine accusative pronoun *die* in (5b) can be omitted, even though it does not match nominative case of the head noun *Lampn*. The crucial difference between the two pronouns concerns the respective paradigms shown in (6).

(6) Paradigms of Bavarian relative pronouns

	masc	neutr	fem	plur
nom	der	des	die	die
acc	den	des	die	die
dat	dem	dem	der(a)	dene(n)

Note that the feminine singular nominative and accusative forms are the same (*die*), while this is not the case for the corresponding masculine singular forms (*der/den*). Hence, we seem to be faced with a similar pattern as in the case of the coordination and of the free relative clause data shown in section 1: a case mismatch seems to be admissible for relative pronoun omission in Bavarian as long as there is match in morphological form with the nominative.

The data in (7) show that omission of relative pronouns is restricted to non-extraposed relative clauses in Bavarian. It turns out that the presence of a relative pronoun is always required in extraposed relative clauses, even if the case of the head noun matches the case of the relative pronoun, as in (7).

- (7) a. Sie gem dem Mo a birn \*(dem) wo mir g'hoifa hom.  
 They give the man (dat) a pear whom that we helped have  
 'They give a pear to the man whom we have helped.'
- b. Dem Kind song mir nix \*(dem) wo mir an Apfe schenka.  
 the child say we nothing whom that we an apple give  
 'We say nothing to the child to whom we give an apple.'

The true generalization about relative pronoun omission, thus, has to be restricted to non-extraposed relative clauses. This adjacency requirement between nominal head and relative clauses was already pointed out by Bayer (1984).

On the basis of the data in (4) and (5) Bayer exempts nominative pronouns from the case matching requirement by assuming that relative pronouns in the nominative case and in all other cases which match the nominative form, carry the feature [– OBLIQUE] and by letting [– OBLIQUE]-marked pronouns delete freely.

Where we differ from Bayer is that he presents an analysis of the data that is intrinsically derivational and relies on a specific ordering between various grammatical principles such as case transmission, [– OBLIQUE]-transmission in COMP and deletion in COMP. What

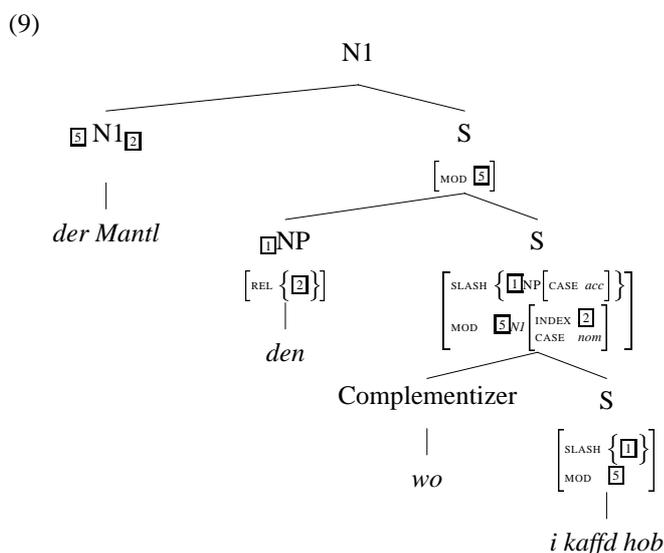
we will show in the next section is that such derivational metaphors are entirely unnecessary and that, instead, a purely declarative account can easily be stated in a constraint-based theory such as HPSG (Pollard and Sag, 1994).

### 3 Bavarian relative clauses – an HPSG analysis

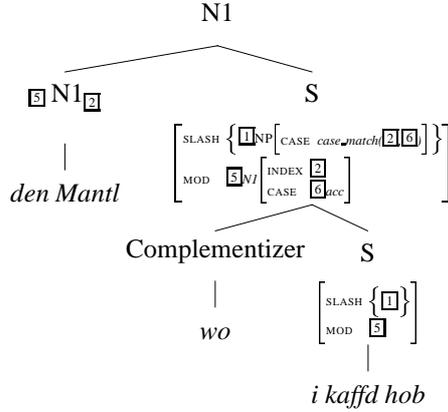
The empirical generalization that forms the basis for our analysis can be stated as in (8).

- (8) A relative pronoun in Bavarian can be omitted if:
1. the relative clause is not extraposed (i.e. adjacent to the head noun that it modifies), and
  2. if either:
    - (a) it matches the case of the head noun, or
    - (b) the omitted relative pronoun is morphologically identical to its nominative form.

Analytically we take as a starting point the HPSG treatment of English relative clauses of Sag (1997) and of German relative clauses of Hinrichs and Nakazawa (1999). In particular, we are assuming that the finite verb constitutes the head of the relative clause and that this finite verb carries a feature MOD that selects for the nominal head that the relative clause modifies. What is special about Bavarian is the appearance of the complementizer inside the head-filler structure. Tree (9) for example (3a) is a case in which the relative pronoun co-occurs with *wo*. The more interesting cases are those in which the pronoun is omitted as in tree (10).



(10)



In (10) for example (3b), the relative clause appears without the filler, i.e. the relative pronoun. Instead, it consists of the complementizer *wo* and a modifier clause with a gap. The structure is licensed by a marker-head ID rule rather than a filler-head ID rule which normally licenses relative clauses. In order to make it possible for a marker-head ID rule to license a relative clause, the adjunct-head ID rule must ensure the right environment for the head noun to be combined with a relative clause without the relative pronoun. The adjunct-head ID rule in (11) ensures this by a functional dependency *case\_match* between the CASE value of the slashed NP of the relative clause and the INDEX and CASE values of the head noun that the relative clause modifies.

$$(11) \quad N1_{[2]} [RESTR \ [3] \cup \ \{4\}] \rightarrow [3] H \left[ \begin{array}{l} RESTR \quad [3] \\ TO-BIND \mid SLASH \ \{ [1] \} \end{array} \right], V \left[ \begin{array}{l} MOD \ [5] NI_{[2]} [CASE \ [6]] \\ CONT \ [4] \\ SLASH \ \{ [1] NP [CASE \ case\_match \ [2] [6]] \} \end{array} \right]$$

The function *case\_match* determines for each possible index and case value of the head noun the case value that the slashed NP can have. The case of the slashed NP has to be restricted in such a way that it captures the empirical generalizations about when this slashed NP does not have to be realized, i.e. the conditions under which the relative pronoun can be omitted. Accordingly, the function needs to be specified as in (12).

$$(12) \quad \begin{aligned} case\_match \left( \begin{array}{l} [GENDER \ masc] \\ [NUMBER \ sing] \end{array}, nom \right) &:= nom \\ case\_match \left( \begin{array}{l} [GENDER \ masc] \\ [NUMBER \ sing] \end{array}, acc \right) &:= acc \vee nom \\ case\_match \left( \begin{array}{l} [GENDER \ masc] \\ [NUMBER \ sing] \end{array}, dat \right) &:= dat \vee nom \\ case\_match \left( \begin{array}{l} [GENDER \ fem] \\ [NUMBER \ sing] \end{array}, nom \right) &:= nom \vee acc \\ case\_match \left( \begin{array}{l} [GENDER \ fem] \\ [NUMBER \ sing] \end{array}, acc \right) &:= acc \vee nom \\ case\_match \left( \begin{array}{l} [GENDER \ fem] \\ [NUMBER \ sing] \end{array}, dat \right) &:= dat \vee nom \vee acc \\ case\_match \left( \begin{array}{l} [GENDER \ neuter] \\ [NUMBER \ sing] \end{array}, nom \right) &:= nom \vee acc \\ case\_match \left( \begin{array}{l} [GENDER \ neuter] \\ [NUMBER \ sing] \end{array}, acc \right) &:= acc \vee nom \\ case\_match \left( \begin{array}{l} [GENDER \ neuter] \\ [NUMBER \ sing] \end{array}, dat \right) &:= dat \vee nom \vee acc \\ case\_match \left( \begin{array}{l} [NUMBER \ plur] \\ \end{array}, nom \right) &:= nom \vee acc \\ case\_match \left( \begin{array}{l} [NUMBER \ plur] \\ \end{array}, acc \right) &:= acc \vee nom \\ case\_match \left( \begin{array}{l} [NUMBER \ plur] \\ \end{array}, dat \right) &:= dat \vee nom \vee acc \end{aligned}$$

Regardless of the gender and number specification the function yields the case value of its input. This reflects condition (2a) of the empirical generalization stated in (8). Additional disjuncts may appear in the output case specification to match condition (2b). Regardless of gender and number, nominative case will appear in the output. But depending on particular gender and number input values, any additional case for which the relative pronoun is identical in form to the nominative will also be included.

## 4 Free relatives

In this section we want to consider another relative construction that we mentioned in the introduction: free relative clauses. Examples (2) were taken from High German. But the same construction is also found in Bavarian German, as shown in (13). Phrase-internally, free relatives in Standard German and in Bavarian German exhibit the same structure as embedded questions: the leftmost constituent is a *w*-pronoun which corresponds to a gap in a verb-final phrase. In contrast to restrictive relative clauses, free relatives lack a nominal head which the relative clause modifies. The absence of such a nominal head provides some of the analytical challenges for free relatives. However, despite the absence of such a nominal head, the free relative seems to play the role of a noun phrase that can occupy an argument position in the clause in which it is embedded. For example, the free relative *Wer zspät kummt* in (13a) constitutes the subject argument of the matrix verb *hod Pech ghabt*.

The reason for discussing free relatives in the context of this paper is that they exhibit the same kind of case matching phenomena that also characterize restrictive relative clauses in Bavarian.

- (13)
- a. Wer zspät kummt, (der) hod Pech ghabt!  
Who (nom) too late comes he (nom) has bad luck had  
'Whoever will come late is unlucky.'
  - b. Wem he ghoifa hod, (dem) hod da Xaver au an Bussl  
whom (dat) he helped has him (dat) has the Xaver also a kiss  
g'gem.  
given  
'Whoever he helped Xaver also gave a kiss.'
  - c. Wos I ma kaffd hob, (des) passt suppa.  
What (acc) I me bought have it (nom) fits super  
'What I bought for myself fits very well.'
  - d. Wem's net passt, (der) hod Pech ghabt!  
whom (dat) it not suits he (nom) has bad luck had  
'Whoever does not like it is unlucky.'
  - e. Wos ibrig wor, (des) hod sie gesse.  
what (nom) left over was it (acc) has she eaten  
'What was left over she ate.'
  - f. Wer des g'mocht hod, \*(dem) hob i a Watschn g'gem.  
who (nom) that done has him (dat) have I a slap given  
'I have given a slap to the person who has done that.'

Free relatives in Bavarian or in Standard German can either appear with or – under certain conditions – without resumptive pronouns. The *d*-pronouns *der*, *des*, *dem* in (13) are examples of such resumptive pronouns. It turns out that the conditions for omitting resumptive pronouns in free relative clauses are parallel to the omission of relative pronouns in restrictive relative clauses. The resumptive pronoun can be omitted if one of two conditions is met: either (a) the syntactic case of the *w*-pronoun has to match the syntactic case of the resumptive pronoun. This condition holds for sentences (13a) and (13b). Or (b) the morphological case of the resumptive pronoun is nominative. This latter condition accounts for examples (13c) - (13e). In (13c) and (13d) the free relative provides the subject argument for the matrix predicate *passt* and *Pech ghabt*. The resumptive pronouns *des* and *der* are in nominative case and hence deletable. In (13e) the free relative provides the object argument for the matrix predicate *gesse*. However, since the object *d*-pronoun *des* is identical in form to its nominative case, it can be omitted. By contrast, (13f) is ungrammatical with the omitted *d*-pronoun since the resumptive pronoun *dem* is not identical to its nominative form *der*.

The discussion of examples (13) shows that conditions for omitting resumptive pronouns from sentences with free relative are exactly parallel to the case of omitted relative words in *wo* relative clauses: either case matching is required between the *w*-pronoun of the free relative and the omissible resumptive pronoun, or the resumptive pronoun has to be morphologically nominative, i.e. have nominative case or be in a case that is identical in form to the nominative.

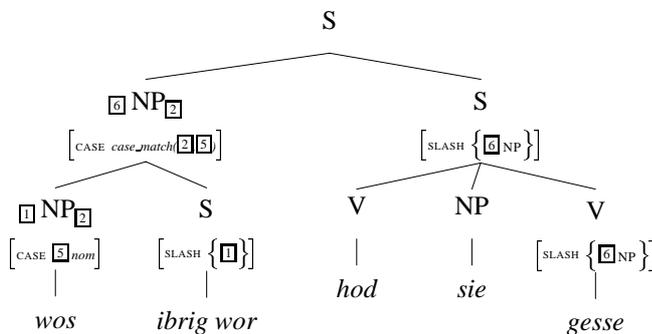
We will not be able to provide a detailed analysis of free relatives in this paper. For a more detailed discussion of free relatives in German we refer interested readers to Müller (1999). Here we will focus mainly on the case matching properties of the construction and the parallels to restrictive relative clauses in Bavarian.

The basic idea behind the analysis can be illustrated by the example tree in (14) for example (13e). Following the insight going back at least to Jackendoff (1977) for English and applied to German by Müller (1999), we treat free relatives as noun phrases. Again following Jackendoff and Müller, we assume that free relatives are a special kind of exocentric phrase in which a gapped sentence combines with a *w*-phrase to form a noun phrase. This noun phrase can then act as the complement of a verb like *gesse*, a complement which in the case of (14) is located in the Vorfeld of a V2-clause.

Unlike Müller (1999), we do not assume a unary rule that further projects such a free relative into an NP. One of the motivations for this unary projection is to account for the case matching phenomena of German free relatives in a unification-based grammar formalism and without having to rely on additional operations such as subsumption (Ingria, 1990), or set-valued case features (Dalrymple and Kaplan, 2000). To this end, Müller introduces a distinction between morphological case and syntactic case whose values are related to one another by a function that is invoked by the unary rule schema. We contend that such an additional feature and the accompanying unary rule schema are not necessary. Rather, all that is needed is the function *case\_match* which is independently needed for Bavarian to account for the case matching phenomena in restrictive relative clauses.

In (14) the function *case\_match* relates the case value nominative of the *w*-pronoun *wos* to the case value of its mother. As shown in (12), this function yields for the input values of *wos*, i.e., *gender neuter*, *case nominative*, and *number singular*, the output value *nom* or *acc*. Due to the subcategorization requirements of the matrix verb *gesse*, this disjunction is then resolved to the value *acc*. It is the functional dependency between the case value of the *w*-word and its mother that allows the simultaneous satisfaction of conflicting subcategorization requirements of the *w*-word and of the free relative as a whole. And as in Müller's analysis we do not need to invoke additional mechanisms like subsumption or set-valued features to account for such mismatches.

(14)



The rule that licenses free relative clauses as in (14) is shown in (15).

$$(15) \quad \text{NP} \left[ \begin{array}{l} \text{CASE } \textit{case\_match} \{2|5\} \\ \text{SLASH } \{ \} \\ \text{CONT } \left[ \begin{array}{l} \text{INDEX } 2 \\ \text{RESTR } 3 \cup \{4\} \end{array} \right] \end{array} \right] \rightarrow \text{NP} \left[ \begin{array}{l} \text{CASE } 5 \\ \text{CONT } \left[ \begin{array}{l} \text{INDEX } 2 \\ \text{RESTR } 3 \end{array} \right] \end{array} \right], \text{S} \left[ \begin{array}{l} \text{CONT } 4 \\ \text{SLASH } \{1\} \end{array} \right]$$

Since the case value of the mother NP and of the NP daughter are only functionally related and therefore not always identical, the NP daughter cannot be considered the head of this construction. Thus, we have to consider free relatives as an exocentric construction. One of the consequences of this analysis is that the nonlocal feature principle of HPSG, which only applies to headed phrases, cannot be invoked to regulate the percolation of SLASH values onto the mother. Rather, the SLASH value on the mother needs to be instantiated by the rule itself and specified as the empty set.

## 5 Conclusion and Outlook

Finally, we would like to motivate the treatment of *wo* as a complementizer in Bavarian restrictive relative clauses. Although a detailed analysis of this aspect of the construction is beyond the scope of this paper, we would like to draw attention to a parallel construction in Bavarian in which a filler also co-occurs with a complementizer. This second construction concerns constituent questions, as in (16), in which the *w*-phrase precedes the same complementizer *daß* that also appears in embedded declarative clauses.

- (16) ... warum daß-ma noch Minga fahrn.  
 ... why that-we to Munich drive  
 '... why we drive to Munich.'

In (16) the complementizer *daß* appears with the first person plural clitic *ma*. This cliticization of personal pronouns also occurs with the complementizer *wo*, as in (17), which constitutes a further parallelism with a construction that clearly involves a complementizer, namely *daß*.

- (17) Des Auto des wo-ts ihr kaffd hab-ts  
 the car which that-2pl you bought have-2pl  
 'the car which you bought'

In sum, we have presented a purely declarative account of Bavarian relative clauses in HPSG and have shown that the analytical tools provided by unification-based or constraint-based grammar formalisms completely suffice to provide a fully adequate and comprehensive analysis of the data.

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