

Object-to-Subject Raising or Lexical Rule—An HPSG Analysis of the German Passive

Stefan Müller, FB Sprachtechnologie, DFKI GmbH, Stuhlsatzenhausweg 3, D-66123 Saarbrücken

Abstract

In this paper I develop a lexical rule based analysis for the passive in German in the paradigm of HPSG. Object-to-Subject-Raising approaches will be discussed and it will be explained why a lexical rule based approach does not have their shortcomings. It will be shown that difficult cases of remote passive can be handled by such an analysis.

1 Object-to-Subject Raising

In HPSG grammars for English and in LFG, the passive is analyzed as a lexical rule. For German many authors followed Haider (1986a) and analyzed the passive as object to subject raising (Heinz and Matiassek, 1994; Kathol, 1994; Lebeth, 1994; Pollard, 1994; Müller, 1999). The advantage of the raising analysis is that one entry for the participle is sufficient. The auxiliary for the perfect (1a), passive (1b), or dative passive (1c) attracts the arguments of the embedded participle in a way that is appropriate for the construction at hand.

- (1) a. Der Mann hat den Ball dem Jungen
the man-NOM has the ball-ACC the boy-DAT
geschenkt.
given
'The man gave the ball to the boy.'
- b. Der Ball wurde dem Jungen geschenkt.
the ball-NOM was the boy-DAT given
'The ball was given to the boy.'
- c. Der Junge bekam den Ball geschenkt.
the boy-NOM got the ball-ACC given
'The boy got the ball as a present.'

In the passive in (1b) the accusative object becomes the subject and the logical subject of the main verb is suppressed. In the dative passive a dative object is promoted to subject.

1.1 Designating the Accusative

Pollard (1994) and Müller (1999) designate the argument that has the properties of an accusative object. For unergative verbs that take an accusative object, the designated ar-

gument is the direct object, for ergative verbs it is the subject. (2) shows the lexical entry for *geschenkt* as it is used in the analysis of all three sentences in (1).

- (2) *geschenkt* ('given' participle form):

HEAD	SUBJ	$\langle \text{NP}[\textit{str}] \rangle$
	ERG	$\langle \boxed{2} \rangle$
	verb	
SUBCAT $\langle \boxed{2} \text{ NP}[\textit{str}], \text{NP}[\textit{ldat}] \rangle$		
cat		

Pollard assumes that the subject of non-finite verbs is listed not represented on the subcat list, but as the value of a special feature SUBJ. *str* stands for structural case. For case assignment see (Meurers, 1999). The following list gives some examples for ergative verbs (marked with 'e') and other non-ergative verbs (marked with 'ne'):

- (3) SUBJ, ERG, SUBCAT

- a. ankommen (e): $\langle \boxed{1} \text{ NP}[\textit{str}] \rangle, \langle \boxed{1} \rangle, \langle \rangle$
- b. tanzen (n): $\langle \text{NP}[\textit{str}] \rangle, \langle \rangle, \langle \rangle$
- c. auffallen (e): $\langle \boxed{1} \text{ NP}[\textit{str}] \rangle, \langle \boxed{1} \rangle, \langle \text{NP}[\textit{ldat}] \rangle$
- d. lieben (ne): $\langle \text{NP}[\textit{str}] \rangle, \langle \boxed{1} \rangle, \langle \boxed{1} \text{ NP}[\textit{str}] \rangle$
- e. helfen (ne): $\langle \text{NP}[\textit{str}] \rangle, \langle \rangle, \langle \text{NP}[\textit{ldat}] \rangle$

For ergative verbs like *ankommen* ('arrive') the ERG value is identical with the SUBJ value. For non-ergative verbs the ERG value is identical to the direct object if there is one and the empty list if there is no accusative object, as for instance *helfen* ('help'). (4) shows the lexical entry for the passive auxiliary which is similar to the one that was suggested by Pollard (1994).

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(4) *werden* (passive auxiliary non-finite form):

HEAD	$\begin{bmatrix} \text{SUBJ} & \boxed{1} \\ \text{ERG} & \boxed{1} \\ \text{verb} \end{bmatrix}$
SUBCAT	$\boxed{2}$
VCOMP	$\left\langle \begin{array}{l} \text{SUBJ} \langle \text{NP}[\text{str}]_{\text{ref}} \rangle, \text{ERG} \boxed{1}, \\ \text{SUBCAT} \boxed{1} \oplus \boxed{2}, \text{VCOMP} \langle \rangle \end{array} \right\rangle$
cat	

The \oplus stands for the concatenation of two lists. The lexical entry accounts for both the personal and the impersonal passive and blocks the passive with ergative verbs. The impersonal passive is formed with verbs like *tanzen* and *helfen*. The ERG value is the empty list, it can be subtracted from the subcat list of the embedded verb, the result being the original subcat list. In the case of an empty ERG value the subject of the embedded verb is suppressed, nothing else changes. If verbs have an element in ERG, the personal passive results. The ERG element is promoted to subject and it is subtracted from the subcat list of the embedded verb, where it was listed as object at the first position.

Sentences like (5) are problematic for object to subject raising analyses. The agent in passive constructions, which may be expressed by a *von*-PP, has to be represented as a complement of the passive auxiliary, since it is not present in the subcat lists of the participles (see (2) and (3), but also the valance lists discussed in the next section).¹ As I mentioned in (Müller, 1999, p. 376), it cannot be explained why the PP can be fronted together with the participle.

- (5) a. Von Grammatikern angeführt werden auch
by grammarians mentioned get also
Fälle mit dem Partizip intransitiver Verben
cases with the participle intransitive verbs
'Grammarians also mention cases with the participle of intransitive verbs.'
- b. Von Riemsdijk entdeckt sind nun Daten, die zeigen,
daß es möglich ist, eine W-Phrase hinter
glauben zu haben.
'Riemsdijk has now discovered data that demonstrate that it is possible to have a W-phrase following *glauben*.'

Since German is assumed to be a V2 language, *von Grammatikern angeführt* should be one phrase. If the *von*-PP is not a complement of the main verb but a complement of the auxiliary, the sentences in (5) would have two constituents in the topic position. If one assumes a lexical rule for passive, the lexical rule can change the subject of a verb into a PP complement and the PP is then a complement of the main verb and can be fronted together with the main verb.

¹ An alternative would be to assume that the PP is an adjunct, but then one had to explain how the thematic linking is established. In lexical rule based approaches to passive the PP is always treated as an optional complement.

Another problem for Pollard's approach is that one needs the participles with passive argument structure anyway to account for sentences like those in (6).

- (6) a. weil er die Äpfel gewaschen ißt.
because he the apples washed eats
'because he eats the apples washed'
- b. So lange gilt die 39-Jährige als nicht
so long counts the 39 year old as not
suspendiert.
suspended
'The 39 year old woman is regarded as suspended for this period.'

For (6) a passive participle is needed that can be used as a predicate directly. In (6a) *gewaschen* is a participle that functions as a depictive secondary predicate, and in (6b) *gelten* selects *als* + predicate. There are no auxiliaries in (6) that could do an object to subject raising.

1.2 Designating the Nominative

The alternative to Pollard's approach was first suggested by Haider (1986a) and later formalized by Heinz and Mathiassek (1994) and Lebeth (1994) in an HPSG style. Haider suggested to designate one argument as the external argument. This designated argument is the subject of non-ergative verbs. Ergative verbs do not have a designated argument. The following list gives some examples:

- (7) DA, SUBCAT
- a. ankommen (e): $\langle \rangle, \langle \text{NP}[\text{str}] \rangle$
- b. tanzen (ne): $\langle \boxed{1} \text{NP}[\text{str}] \rangle, \langle \boxed{1} \rangle$
- c. auffallen (e): $\langle \rangle, \langle \text{NP}[\text{str}], \text{NP}[\text{ldat}] \rangle$
- d. lieben (ne): $\langle \boxed{1} \text{NP}[\text{str}] \rangle, \langle \boxed{1}, \text{NP}[\text{str}] \rangle$
- e. helfen (ne): $\langle \boxed{1} \text{NP}[\text{str}] \rangle, \langle \boxed{1}, \text{NP}[\text{ldat}] \rangle$

Haider suggests a blocking of the designated argument for participles. The external argument is blocked and cannot be realized in a phrasal projection. Only the perfect auxiliary can deblock this argument. Heinz and Mathiassek suggest a lexical rule that produces the lexical entries in (8) for participles.

- (8) DA, SUBCAT
- a. angekommen (e): $\langle \rangle, \langle \text{NP}[\text{str}] \rangle$
- b. getanzt (ne): $\langle \text{NP}[\text{str}] \rangle, \langle \rangle$
- c. aufgefallen (e): $\langle \rangle, \langle \text{NP}[\text{str}], \text{NP}[\text{ldat}] \rangle$
- d. geliebt (ne): $\langle \text{NP}[\text{str}] \rangle, \langle \text{NP}[\text{str}] \rangle$
- e. geholfen (ne): $\langle \text{NP}[\text{str}] \rangle, \langle \text{NP}[\text{ldat}] \rangle$

The designated argument is contained in the DA value of the participle, but not in the subcat list. The passive auxiliary

takes over the subcat list, but does not reactivate the designated argument. In contrast the perfect auxiliary appends the DA value and the subcat value and therefore contains the designated argument of the embedded participle in its subcat list.

This approach has the advantage that participles always have a passive argument structure. They may therefore be input to adjective formation lexical rules that produce adjectives which can be used in an analysis of (6).

However, the approach really gets into difficulties when it comes to modal infinitives as in (9).

- (9) a. Die Angelegenheit ist von euch zu erledigen.
the matter is by you to settle
'The matter is to be settled by you.'
- b. Ihr habt die Angelegenheit zu erledigen.
you have the matter to settle
'You have to settle the matter.'

In general, for every active sentence there is a sentence with the *zu* infinitive and *haben* and for every passive sentence there is a sentence with the *zu* infinitive and *sein* (Bierwisch, 1963, p. 72).

Heinz and Mathiassek do not discuss this construction, but they are entirely parallel to the passive cases and this was also noted by Haider. The lexical entries for the infinitives are shown in (10).

- (10) DA, SUBCAT
- a. ankommen (e): $\langle \rangle, \langle \text{NP}[\text{str}] \rangle$
- b. zu tanzen (ne): $\langle \text{NP}[\text{str}] \rangle, \langle \rangle$
- c. aufzufallen (e): $\langle \rangle, \langle \text{NP}[\text{str}], \text{NP}[\text{ldat}] \rangle$
- d. zu lieben (ne): $\langle \text{NP}[\text{str}] \rangle, \langle \text{NP}[\text{str}] \rangle$
- e. zu helfen (ne): $\langle \text{NP}[\text{str}] \rangle, \langle \text{NP}[\text{ldat}] \rangle$

The designated argument is blocked and can only be reactivated by the *haben*. In connection with *sein* it stays blocked. The problem now is that all infinitives in (10) can be used in control constructions:

- (11) a. Er behauptet, spät ankommen.
he claims late to arrive
'He claims to arrive late.'
- b. Er behauptet, nicht gern zu tanzen.
he claims not with.pleasure to dance
'He claims to not like dancing.'
- c. Er behauptet, Frauen selten
he claims women_{dat} seldom
aufzufallen.
to.attract.attention
'He claims to seldom attract the attention of women.'
- d. Er behauptet, sie zu lieben.
he claims her to love
'He claims to love her.'

- e. Er behauptet, Blinden zu helfen.
he claims blind to help
'He claims to help blind people.'

Since the subject of the embedded verb is not represented in a uniform way for the controlled verbs in (11), the controlling verb had to distinguish between ergative and non-ergative embedded verbs. Heinz and Mathiassek propose an analysis of control where the first element of the subcat list of the embedded verb is coindexed with the subject or an oblique complement of the matrix verb, but this analysis only works, if no designated argument reduction is assumed for infinitives. But such an argument reduction is necessary because of the modal infinitives discussed above.

One could try to save this approach by stipulating a SUBJ feature that contains the subject of both ergative and non-ergative verbs and that is used to establish the control relation only. The problem of this approach is the notion of phrase: The control verb (in incoherent constructions) can neither select for an infinitive with one single element on the subcat list, as was suggested by Heinz and Mathiassek nor can it select for a fully saturated projection of an infinitive. The first option does not work since the designated argument of non-ergative verbs is blocked and there is either nothing left on the subcat list (*tanzen*) or the elements that are left have to be realized in a projection of the infinitive (*lieben*, *helfen*). The second option does not work since the subject of ergative verbs still is a member of the subcat list. The approach wrongly would predict that sentences like those in (12) are grammatical.

- (12) a. * Er behauptet, er spät ankommen.
he claims he late to arrive
- b. * Er behauptet, er Frauen selten
he claims he women seldom
aufzufallen.
to.attract.attention

So the only solution to this problem seems to stipulate special lexical entries for infinitives in incoherent control constructions. But with such a stipulation one has again a proliferation of lexical entries and avoidance of this was one of the main purposes of shifting the active/passive change into the auxiliaries.

In concluding this section about object to subject raising approaches, it must be said that neither the object to subject raising approach of Pollard (1994) and the extensions that I suggested in (Müller, 1999, Chapter 15) nor the HPSG implementation of Haider's approach by Heinz and Mathiassek and Lebeth are satisfying. While the first approach cannot provide a unified treatment of passivization and adjective formation, the latter fail completely in accounting for modal infinitive constructions and for incoherent constructions with *zu* infinitives. In what follows I will provide an alternative analysis that uses lexical rules to derive several lexical entries per verb that all reflect the argument structure that later surfaces in the sentence.

2 Lexical Rules

Proponents of lexical rule based analyses were not able to explain the so-called remote passive in a satisfying way: Kiss (1992) does not account for it at all, and Hinrichs and Nakazawa (1998) stipulate a special purpose lexical rule.

- (13) weil der Wagen oft [[zu reparieren versucht]
because the car often to repair tried
wurde].
was
'because it was often tried to repair the car.'

In remote passive constructions the object of a verb that is embedded under the passive participle becomes subject of the clause. This was explained by the assumption that *zu reparieren* (14) and *versucht* (15) form a verbal complex (16), and the object of this verbal complex is promoted to the subject of the complete verbal complex by its head, the auxiliary *werden*.

- (14) *reparieren* (entry for base form and *zu* infinitive):

HEAD	<div> <div>SUBJ</div> <div> <div>NP[<i>str</i>]</div> </div> </div> <div> <div>ERG</div> <div> <div>2</div> </div> </div> <div> <div>verb</div> </div>
SUBCAT	<div> <div>2</div> <div>NP[<i>str</i>]</div> </div>
VCOMP	<div> </div>
cat	

- (15) *versuchen* (entry for base form and *zu* infinitive):

HEAD	$\left[\begin{array}{c} \text{SUBJ} \left\langle \text{NP}[\textit{str}] \right\rangle \\ \text{ERG} \quad \boxed{2} \\ \textit{verb} \end{array} \right]$
SUBCAT	$\boxed{3}$
VCOMP	$\left\langle \begin{array}{c} \text{V}[\textit{inf}, \text{LEX}+, \text{SUBJ} \left\langle \text{NP}[\textit{str}] \right\rangle], \\ \text{ERG} \quad \boxed{2}, \text{SUBCAT} \quad \boxed{3} \end{array} \right\rangle$
cat	

- (16) *zu reparieren versucht*:

HEAD	$\left[\begin{array}{l} \text{SUBJ} \left\langle \text{NP}_{[str]} \right\rangle \\ \text{ERG} \left\langle \boxed{2} \right\rangle \\ \textit{verb} \end{array} \right]$
SUBCAT	$\left\langle \boxed{2} \text{NP}_{[str]} \right\rangle$
VCOMP	$\langle \rangle$
<i>cat</i>	

In what follows, I will propose a lexical rule that can account for the personal and impersonal variants of the normal passive and for the remote passive as well. The rule also uses Pollard's ERG feature.²

²A less general rule that produces similar results was suggested by Kathol (1998, p. 255). Kathol does not use the ERG feature in his rule. His rule does not extend to the cases discussed below.

$$(17) \left[\begin{array}{c} \text{SYNSEM|LOC|CAT} \\ \left[\begin{array}{c} \text{HEAD} \left[\begin{array}{c} \text{SUBJ} \langle \text{NP}[\text{str}] \boxed{1} \text{ref} \rangle \\ \text{ERG} \boxed{2} \end{array} \right] \\ \text{SUBCAT} \langle \boxed{2} \oplus \boxed{3} \rangle \end{array} \right] \\ \text{lexical-sign} \end{array} \right] \rightarrow \left[\begin{array}{c} \text{SYNSEM|LOC|CAT} \\ \left[\begin{array}{c} \text{HEAD} \left[\begin{array}{c} \text{VFORM} \text{passive-part} \\ \text{SUBJ} \boxed{2} \\ \text{ERG} \boxed{2} \end{array} \right] \\ \text{SUBCAT} \langle \boxed{3} \oplus \langle \text{PP}[\text{von-durch}] \boxed{1} \rangle \rangle \end{array} \right] \\ \text{lexical-sign} \end{array} \right]$$

The output this rule produces for (14) is shown in (18).

- (18) *repariert* (passive participle):

HEAD	SUBJ	$\boxed{1}$	$\langle \text{NP}_{[str]} \rangle$
	ERG	$\boxed{1}$	
	$verb$		
SUBCAT	$\langle \rangle$		
VCOMP	$\langle \rangle$		
cat			

- (19) *werden* (passive auxiliary):

HEAD	SUBJ	$\boxed{1}$
	ERG	$\boxed{1}$
	<i>verb</i>	
SUBCAT	$\boxed{2}$	
VCOMP	$\langle \text{V}[\textit{pass-part}, \text{SUBJ } \boxed{1}, \text{SUBCAT } \boxed{2}] \rangle$	
<i>cat</i>		

The passive auxiliary is a raising verb that selects a passive participle and raises both its subject and its complements (Kiss, 1992). The result of an application to the entry for *versuchen* is shown in (20).

- (20) *versucht* (attraction version, passive participle):

HEAD	$\left[\begin{array}{c} \text{SUBJ} \quad \boxed{2} \\ \text{verb} \end{array} \right]$
SUBCAT	$\boxed{3} \oplus \left\langle \left(\text{PP}[\text{von-durch}] \boxed{1} \right) \right\rangle$
VCOMP	$\left\langle \begin{array}{c} \text{V}[\text{inf}, \text{LEX}+, \text{SUBJ} \left\langle \text{NP}[\text{str}] \boxed{1} \right\rangle, \\ \text{ERG} \quad \boxed{2}, \text{SUBCAT} \quad \boxed{2} \oplus \boxed{3} \end{array} \right\rangle$
cat	

The interesting thing about this result of the rule application is that the ERG value of the verb that is embedded under *versucht* is subtracted from the embedded verb's subcat list and only the remainder of this list is raised. The accusative object of the verb that is embedded under *versucht* is the subject of the passive participle. After the combination of (20) with (14) one gets (21).

(21) *zu reparieren versucht* (verbal complex):

$$\left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{SUBJ} \langle \text{NP}[\text{str}] \rangle \\ \text{verb} \end{array} \right] \\ \text{SUBCAT} \langle (\text{PP}[\text{von-durch}]) \rangle \\ \text{VCOMP} \langle \rangle \\ \text{cat} \end{array} \right]$$

The object of *zu reparieren* ([2] in (14)) is subtracted from the complete subcat list of the embedded verb. Since the embedded verb had only one element on its subcat list, the result ([3] in (20)) is the empty list. The only element in the subcat list of *zu reparieren versucht* is the optional PP for the agent.

The preliminary rule in (17) cannot account for the sentences in (22).

- (22) a. Keine Zeitung wird ihr zu lesen erlaubt.³
 no newspaper was her to read allowed
 ‘She is not allowed to read any newspapers.’
 b. Der Erfolg wurde uns nicht auszukosten
 the success was us not to.enjoy
 erlaubt.⁴
 permitted
 ‘We were not permitted to enjoy our success.’

The reason is that *erlauben* is an object control verb that takes a dative object.

(23) *erlauben* (entry for base and *zu* infinitive):

$$\left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{SUBJ} \langle \text{NP}[\text{str}] \rangle \\ \text{ERG} [2] \\ \text{verb} \end{array} \right] \\ \text{SUBCAT} \langle \text{NP}[\text{dat}] \rangle \oplus [3] \\ \text{VCOMP} \langle \text{V}[\text{inf}, \text{LEX}+, \text{SUBJ} \langle \text{NP}[\text{str}] \rangle], \rangle \\ \text{cat} \end{array} \right]$$

Since the dative object is at the first position in the subcat list of *erlauben*, a possibly raised object of the embedded verb cannot be subtracted from the beginning of this list. The rule in (17) is generalized to (24).

$$(24) \left[\begin{array}{l} \text{SYNSEM|LOC|CAT} \\ \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{SUBJ} \langle \text{NP}[\text{str}] [1]_{\text{ref}} \rangle \\ \text{ERG} [2] \end{array} \right] \\ \text{SUBCAT} [3] \end{array} \right] \end{array} \right] \rightarrow$$

$$\left[\begin{array}{l} \text{SYNSEM|LOC|CAT} \\ \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{VFORM} \text{ passive-part} \\ \text{SUBJ} [2] \end{array} \right] \\ \text{SUBCAT} ([3] \ominus [2]) \oplus \langle (\text{PP}[\text{von-durch}] [1]) \rangle \end{array} \right] \end{array} \right]$$

The ‘ \ominus ’ in $A \ominus B = C$ stands for a relation where C is equal to A , iff B is the empty list. Otherwise C is the list that deletes the first part in A that is identical to B . (25) lists the cases that are relevant for the present discussion.

$$(25) \begin{aligned} \langle a, b, c \rangle \ominus \langle \rangle &= \langle a, b, c \rangle \\ \langle a, b, c \rangle \ominus \langle a \rangle &= \langle b, c \rangle \\ \langle a, b, c \rangle \ominus \langle b \rangle &= \langle a, c \rangle \end{aligned}$$

(26) *erlaubt* (attraction version, passive participle):

$$\left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{SUBJ} [2] \\ \text{verb} \end{array} \right] \\ \text{SUBCAT} ((\langle \text{NP}[\text{dat}] \rangle \oplus [3]) \ominus [2]) \oplus \langle (\text{PP}[\text{von-durch}] [1]) \rangle \\ \text{VCOMP} \langle \text{V}[\text{inf}, \text{LEX}+, \text{SUBJ} \langle \text{NP}[\text{str}] [1] \rangle], \rangle \\ \text{cat} \end{array} \right]$$

In the rule (24) the subcat list of the input is not split by \oplus as in (17), but instead \ominus is used in the output to subtract the ERG value, possibly coming from an embedded sign. The entry for *auszukosten* has the same syntactic features as the one for *zu reparieren* which was given in (14). The combination of (26) with this entry yields (27).

(27) *auszukosten erlaubt* (attraction version, passive participle):

$$\left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{SUBJ} \langle \text{NP}[\text{str}] \rangle \\ \text{verb} \end{array} \right] \\ \text{SUBCAT} \langle \text{NP}[\text{dat}] \rangle \oplus \langle (\text{PP}[\text{von-durch}]) \rangle \\ \text{VCOMP} \langle \rangle \\ \text{cat} \end{array} \right]$$

This is exactly what is needed to analyze (22). Note that the rule in (27) does not apply to ergative verbs although ergative verbs are unifyable with the left hand side of the rule. The rule does not produce a result, since the subtraction in the right hand side of the rule fails.

3 Summary

In this paper a lexical rule based analysis for the passive in German was developed which also covers the complicated remote passive cases. The analysis uses the features that was introduced by Pollard (1994) who suggested an object to subject raising analyses.

³Stefan Zweig, *Marie Antoinette*. Leipzig: Insel-Verlag. 1932, p. 515, quoted from (Bech, 1955, p. 309). That this is an instance of remote passive was noted by Askedal (1988, p. 13).

⁴(Haider, 1986b, p. 110)

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