

Case in German – An HPSG Analysis

Stefan Müller*

Stefan.Mueller@dfki.de

<http://www.dfki.de/~stefan/>

DFKI GmbH
Language Technology Lab
Stuhlsatzenhausweg 3
66123 Saarbrücken



1 Introduction

In the following paper I will provide an approach to case assignment in German that builds on work done by Heinz and Matiasek (1994). Some shortcomings of their approach will be pointed out and the case principle will be adapted in a way that case assignment in coherent constructions¹ and case assignment in adjective environments can be handled properly. Furthermore, it will be shown that elements which do not surface bear case, and a proper treatment of this phenomenon will be provided.

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¹See (Bech, 1955) for terminology.

The type hierarchy Heinz and Matiasek proposed is neither sufficient for handling case assignment in copula constructions, nor is it suited to describe a phenomenon called *Kongruenzkasus*. A new feature geometry for the *case* feature will be developed that overcomes these shortcomings.

2 The Phenomena

2.1 Lexical vs. Structural Case

In German there is a distinction between structural and lexical case². Elements the case of which varies according to their syntactic environment are said to bear structural case. If the case does not change, the case is said to be lexical.

- (1) a. Der Installateur kommt.
the plumber_{nom} comes
'The plumber is coming.'
- b. Der Mann sieht den Installateur kommen.
the man sees the plumber_{acc} come
'The man can see the plumber coming.'
- c. das Kommen des Installateurs
the coming the plumber_{gen}
'the coming of the plumber'

In (1), the case of *der Installateur* is different in all sentences. In (1a) *der Installateur* is the subject and bears nominative. In (1b) *der Installateur* is the object of the Acl-verb *sehen* and gets accusative, and in (1c) it is a complement of a noun and gets genitive. Nominative, genitive and accusative are structural cases.

Another construction where a change of structural case takes place is passivization.

- (2) a. Der Mann hat den Hund getreten. b. Der Hund wurde (von dem Mann) getreten.
the man_{nom} has the dog_{acc} kicked the dog_{nom} was by the man kicked
'The man kicked the dog.' 'The dog was kicked (by the man).'

If the case of the object is dative, no change takes place.

- (3) a. Der Mann hat mir geholfen. b. Mir wird geholfen.
the man has me helped me was helped
'The man helped me.' 'Somebody is helping me.'

This is usually explained by a subject-to-object-raising analysis of passivization.³ The subject of a finite sentence receives nominative and the object accusative if its case is structural. In (2b), the object of the verb *geschlagen* is raised to subject of the passive auxiliary *werden* and therefore receives nominative. If the case of the object is dative, i.e. lexical, it does not change during passivization.

While this phenomenon could, in principle, be handled without a distinction between structural and lexical case by assuming two morphologically equal entries that are selected by the appropriate matrix verb, the following sentences—the so-called remote passive—cannot be described in this way.

²(Haider, 1985)

³Throughout this paper, I assume a variant of Pollard's (1994) theory.

- (4) a. , daß Karl ihm den Wagen zu reparieren versprochen hat.
 that Karl him the car_{acc} to repair promised has
 ‘that Karl promised him he would fix his car’
- b. , weil der Wagen oft zu reparieren versucht wurde.
 because the car_{nom} often to repair tried was
 ‘because many attempts were made to fix the car’
- c. , weil oft versucht wurde, den Wagen zu reparieren.
 because often tried was the car_{acc} to repair
 ‘because it was frequently attempted to fix the car’

In (4b) the object of *reparieren* is raised twice to become the subject of the passive auxiliary *werden* that embeds the verbal complex *zu reparieren versucht*.

If prenominal participles are analyzed as adjectives, it is reasonable to assume that adjectives can assign case in the same way infinite verbs do.

- (5) a. Der [alles bestimmen wollende] Apparat hat schon seit Jahren initiativreiche Kräfte abgestoßen, reproduziert sich aus angepaßter Mittelmäßigkeit und erstickt jegliche Initiative außerhalb seines begrenzten Realitätsbezuges.⁴
 ‘The machine which wants to control all the descisions has been repelling personnel with initiative for years; it reproduces itself with conformist mediocrity and stifles any initiative outside its own narrow-minded sense of reality.’
- b. Den [Gesellschaft verändern wollenden] Impuls glaube ich dabei nicht.⁵
 ‘I do not believe the impulse to want to change society in this context.’
- c. die [das „Andere der Vernunft“ befreien wollenden] Brüder Böhme⁶
 ‘the brothers Böhme, who want to liberate „the other side of reason“’

In (5) the verbs embedded under *wollende* form a complex with the matrix adjective. This is completely analog to the treatment of the verbal complex proposed by Hinrichs and Nakazawa (1989). As has been shown in Müller (To appear), adjectives take part in complex formation in the very same way as verbs do. There is evidence for this from scope facts, from linearization facts and from complex fronting data⁷.

- (6) Wenn jemand nicht zu regieren fähig ist, soll er auch die Ämter nicht besetzen.⁸
 ‘Someone who is incapable of ruling should not hold office.’

In (6), the adverb *nicht* can scope over both *regieren* and *fähig*.

- (7) weil ihr der Mann immer treu sein wollte.
 because her the man always faithful be wants.to
 ‘The man wanted to be faithful to her.’

⁴taz-berlin, 10.19.89, p. 11

⁵taz, 08.05.88, p. 16

⁶taz, 07.01.88, p. 15

⁷See (Müller, 1997b) for other examples of partial adjective phrase fronting.

⁸Tagesschau (TV-News), 10.12.95, Friedhelm Brebeck

In (7), the adverb can scope over the adjective and the verb *wollte*. In addition, the complement of the adjective appears to the left of the subject of *wollte*. While scope and word order phenomena constitute the classical tests for coherent constructions developed by Bech (1955), the possibility of fronting of partial projections can be seen as a coherence test too.

- (8) Treu will Karl seiner Frau sein.
 faithful wants Karl his wife be
 ‘Karl wants to be faithful to his wife.’

As was shown in (Müller, 1997b), the fronting of partial adjective phrases is completely analogue to the partial verb phrase examples cited in the literature.⁹

So, if in (5a) *bestimmen wollende* is a complex and the argument of *bestimmen* is raised by *wollende*, the complex has to assign case to *alles*. Hence, contrary to the claim by Haider (1985, p. 87) and Heinz and Matiasek (1994, p. 211) that structural case is assigned by verbs and nouns only, the data show that structural case must also be assigned in adjectival environments.

Lexical case can be assigned by verbs (9), adjectives (10), and prepositions (11). Genitive, dative and accusative are lexical cases.

- (9) a. Wir gedenken der Opfer.
 We commemorate the victims_{gen}
 b. Der Opfer wird gedacht.
 the victims_{gen} were commemorated
 ‘The victims are being commemorated.’
 c. Er hilft ihm.
 he helps him_{dat}
 d. Ihm wird geholfen.
 him_{dat} was helped
 ‘He is being given help.’

- (10) a. Er war sich dessen sicher.
 he was REFL it_{gen} sure
 ‘He was sure of it.’
 b. Sie ist ihm treu.
 she is him_{dat} faithful
 ‘She is faithful to him.’

- (11) a. wegen des Installateurs
 because.of the plumber_{gen}
 b. mit dem Installateur
 with the plumber_{dat}
 c. auf den Installateur
 for the plumber_{acc}

In addition, I assume that nominative can be assigned lexically.

- (12) a. Er beschloß, ein Linguist zu werden.¹⁰
 he decided a linguist_{nom} to become
 ‘He decided to become a linguist.’

⁹Cf. (Heidolph, Fläming, and Motsch, 1981).

¹⁰(Oppenrieder, 1991, p. 216)

- b. Ich bin dein Tanzpartner.
I am your dancing.partner_{nom}
- c. Baby, laß mich dein Tanzpartner sein.¹¹
baby let me your dancing.partner_{nom} be
'Baby, let me be your dancing partner.'

Although the predicate in copula constructions is nominative, this case does not change in AcI-constructions. The case that is assigned to objects with structural case is accusative. As the case of *Linguist* in (12a) is nominative, it must be lexical.¹²

2.2 Kongruenzkasus

There are some German verbs that take two arguments with the same case independent of their syntactic function in the sentence.

- (13) a. Sie nannte ihn einen Lügner.
she called him_{acc} a liar_{acc}
- b. Er wurde ein Lügner genannt.
he_{nom} was a liar_{nom} called
'He was called a liar.'

The case of *ihn* and *einen Lügner* is accusative in (13a) and nominative in (13b). The change of *ihn* to *er* after passivization is expected. The object *ein Lügner* has the same case as *er/ihn* has. This phenomenon is called *Kongruenzkasus*. (14) is also an instance of this phenomenon: the case of the prepositional phrase has to be identical with the case of the underlying first object of *ansetzen*.

- (14) a. Ich sehe ihn als meinen Freund an.¹³
I see him_{acc} as my friend_{acc} PRFX
'I regard him as my friend.'
- b. Er wird als mein Freund angesehen.
he_{nom} is as my friend_{nom} seen
'He is regarded as a friend of mine.'

2.3 The Case of Non-realized Dependents

Höhle (1983, Chapter 6) provided a test that makes it possible to determine the case of non-realized dependents. The adverbial phrase *ein- nach d- ander-* refers to a plural antecedent. The phrase has to agree with its antecedent in gender and case.

- (15) a. [Die Türen]_i sind [eine nach der anderen]_i kaputt gegangen.
'The doors broke one after another.'

¹¹Funny van Dannen, Benno-Ohnesorg-Theater, Berlin, Volksbühne, 10.11.95

¹²The idea of lexical nominative can be found in (Thiersch, 1978, p. 54) already.

¹³(von Stechow and Sternefeld, 1988, p. 154)

- b. [Einer nach dem anderen]_i haben wir_i die Burschen runtergeputzt.
‘We took turns in bringing the lads down a peg or two.’
- c. [Einen nach dem anderen]_i haben wir [die Burschen]_i runtergeputzt.
‘One after the other, we brought the lads down a peg or two.’
- d. Ich ließ [die Burschen]_i [einen nach dem anderen]_i einsteigen.
‘I let the lads get in (get started) one after the other.’
- e. Uns_i wurde [einer nach der anderen]_i der Stuhl vor die Tür gesetzt.
‘We were given the sack one after the other.’
- (16) a. Er hat uns gedroht, [die Burschen]_i demnächst [einen nach dem anderen]_i wegzuschicken.
‘He threatened us that soon he would send the lads away one after the other.’
- b. Er hat angekündigt, uns_i dann [einer nach der anderen]_i den Stuhl vor die Tür zu setzen.
‘He announced that he would then sack us one after the other.’
- c. Es ist nötig, [die Fenster]_i, sobald es geht, [eins nach dem anderen]_i auszutauschen.
‘It is necessary the exchange the windows one after the other as soon as possible.’
- (17) a. Ich habe [den Burschen]_i geraten, im Abstand von wenigen Tagen [einer nach dem anderen]_i zu kündigen.
‘I advised the lads to hand in their notice one after the other at intervals of a few days.’
- b. [Die Türen]_i sind viel zu wertvoll, um [eine nach der anderen]_i verheizt zu werden.
‘The doors are much too precious to be burnt one after the other.’
- c. Wir_i sind es leid, [eine nach der anderen]_i den Stuhl vor die Tür gesetzt zu kriegen.
‘We are tired of being given the sack one after the other.’

In (17), the *ein- nach d- ander-* phrase is not the subject, as the subject is never realized as a dependent of a verb in infinitive form. But *ein- nach d- ander-* refers to the subject of the infinitive. The subject of the infinitive is controlled by the matrix verb and the semantic content of the object of the matrix verb—in (17a) the object is *den Burschen*—is identical to the subject of the *zu* infinitive.¹⁴ The case, however, is not. The case of *den Burschen* is accusative while the case of the controlled subject of the *zu* infinitive is nominative, as is proved by the case of *einen nach dem anderen*.

Höhle provided the examples (15)–(17), but of course a completely analogue example with adjectival participle heads can be constructed.

- (18) a. die [eines nach dem anderen]_i einschlafenden Kinder_i
the one_{nom,neu} after the other nodding.off children
‘the children who were nodding off one after the other’
- b. die [einer nach dem anderen]_i durchstartenden Halbstarken_i
the one_{nom,mas} after the other revving hooligans
‘the hooligans who were revving one after the other’

¹⁴For an explanation of the control theory assumed in HPSG see (Pollard and Sag, 1994, Chapter 3.5). For control and raising in German see (Kiss, 1994; Kiss, 1995).

- c. die [eine nach der anderen]_i loskichernden Frauen;
 the one_{nom,fem} after the other starting.to.giggle women
 ‘the women who were starting to giggle one after the other’

3 The Predicate Complex

Hinrichs and Nakazawa (1989) introduced the notion of argument attraction into the HPSG-framework. They argued that it is reasonable to combine the verbs in a verbal complex before complements are saturated. The passive analysis of Pollard (1994) builds on those insights. Without giving a detailed explanation of the analysis, I will show example lexical entries which will be sufficient to explain the interaction with case phenomena.

I assume the following lexical entry for the perfect auxiliaries *haben* and *sein*.¹⁵

$$(19) \quad \begin{array}{l} \textit{haben/sein:} \\ \left[\begin{array}{l} \text{HEAD} \quad \left[\begin{array}{l} \text{SUBJ } \boxed{1} \\ \textit{verb} \end{array} \right] \\ \text{SUBCAT } \boxed{2} \\ \text{VCOMP } \text{V}[\text{LEX+},\textit{ppp},\text{SUBJ } \boxed{1}, \text{SUBCAT } \boxed{2}, \text{VCOMP } \textit{none}] \\ \textit{cat} \end{array} \right] \end{array}$$

The finite form of those lexical entries lists the value of SUBJ on its subcat list. The reason for this is that subjects of finite verbs in German can be extracted in the same way as objects or other complements can. So it is reasonable to list them on one list to which extraction applies.

$$(20) \quad \begin{array}{l} \textit{hat/ist:} \\ \left[\begin{array}{l} \text{HEAD} \quad \left[\begin{array}{l} \text{SUBJ } \langle \rangle \\ \textit{verb} \end{array} \right] \\ \text{SUBCAT } \boxed{1} \oplus \boxed{2} \\ \text{VCOMP } \text{V}[\text{LEX+},\textit{ppp},\text{SUBJ } \boxed{1}, \text{SUBCAT } \boxed{2}, \text{VCOMP } \textit{none}] \\ \textit{cat} \end{array} \right] \end{array}$$

The lexical entries of modals are similar to the entries for *haben/sein*. I assume that lexical entries for adjectival participles are produced by a lexical rule that produces the following output:

$$(21) \quad \begin{array}{l} \textit{wollend-:} \\ \left[\begin{array}{l} \text{HEAD} \quad \left[\begin{array}{l} \text{SUBJ } \boxed{1} \langle \text{NP}[\textit{str}] \boxed{2} \rangle \\ \text{MOD } \bar{\text{N}} \boxed{2} \\ \textit{adj} \end{array} \right] \\ \text{SUBCAT } \boxed{3} \\ \text{VCOMP } \text{V}[\text{LEX+},\textit{ppp},\text{SUBJ } \boxed{1}, \text{SUBCAT } \boxed{3}, \text{VCOMP } \textit{none}] \\ \textit{cat} \end{array} \right] \end{array}$$

str stands for structural case.

¹⁵Note that verbal complements are selected via VCOMP instead of SUBCAT. This was argued for by Chung (1993) and by Rentier (1994). Verbal complexes are licensed by a special schema, i.e. they are not head complement structures.

Pollard (1994) assumes a feature ERG that singles out the subject or object with accusative properties in addition to valence features. For so-called ergative verbs¹⁶, the ERG value is identical to the subject, for non ergative verbs it is identical to the accusative object, if there is one. If there is no accusative object, the ERG value is the empty list. (22) shows the entry for the non ergative verb *reparieren*.¹⁷

$$(22) \left[\begin{array}{l} \text{reparieren:} \\ \text{HEAD} \left[\begin{array}{l} \text{SUBJ} \langle \text{NP}[\textit{str}] \rangle \\ \text{ERG} \langle \boxed{1} \rangle \\ \textit{verb} \end{array} \right] \\ \text{SUBCAT} \langle \boxed{1} \text{ NP}[\textit{str}] \rangle \\ \textit{cat} \end{array} \right]$$

The lexical entry for the passive auxiliary *werden* has the form shown in (23).

$$(23) \left[\begin{array}{l} \text{werden:} \\ \text{HEAD} \left[\begin{array}{l} \text{SUBJ} \boxed{1} \\ \text{ERG} \boxed{1} \\ \textit{verb} \end{array} \right] \\ \text{SUBCAT} \boxed{2} \oplus \langle (\text{PP}[\textit{von}]: \boxed{3} \textit{ref}) \rangle \\ \text{VCOMP} \text{ V}[\text{LEX+}, \textit{ppp}, \text{SUBJ} \langle \text{NP}[\textit{str}]: \boxed{3} \rangle, \text{ERG} \boxed{1}, \\ \text{SUBCAT} \boxed{1} \oplus \boxed{2}, \text{VCOMP} \textit{none}] \\ \textit{cat} \end{array} \right]$$

Werden raises the element with accusative properties to subject if it is a complement. The subject of the embedded verb can be realized as a prepositional phrase.

For the coherent version of *versuchen* Pollard assumes an entry which is similar to (24).¹⁸

$$(24) \left[\begin{array}{l} \text{versuchen (subject control verb, coherent version):} \\ \text{HEAD} \left[\begin{array}{l} \text{SUBJ} \langle \text{NP}[\textit{str}]: \boxed{1} \rangle \\ \text{ERG} \boxed{2} \\ \textit{verb} \end{array} \right] \\ \text{SUBCAT} \boxed{3} \\ \text{VCOMP} \text{ V}[\textit{inf}, \text{LEX+}, \text{SUBJ} \langle \text{NP}[\textit{str}]: \boxed{1} \rangle, \text{ERG} \boxed{2}, \text{SUBCAT} \boxed{3}] \\ \textit{cat} \end{array} \right]$$

The sentence (4b) is then analyzed as follows: the verb *versucht* is combined with *zu reparieren*. The index of the subject of *versucht* is structure shared with the index of the embedded verb, the

¹⁶Cf. (Grewendorf, 1989; Fanselow, 1992).

¹⁷From looking at Pollard's (1994) entries it is not clear where the feature ERG is located. As he lists HEAD features and as ERG is at the same level like COMPS, it seems to be the case that Pollard assumes the path SYNSEM|LOC|CAT for ERG. However, the analysis for remote passive suggested by Pollard only works if ERG is a head feature.

¹⁸The entry differs from the one given by Pollard in that the ERG value is not identical with the first element on the subcat list of the embedded verb. Pollard's entry would predict that ergative verbs cannot be embedded in coherent constructions with *versuchen*, which is wrong.

- (i) , weil Karl der Frau nicht aufzufallen versucht.
 'because Karl tries not to be noticed by the woman.' or
 'because Kral does not try to be noticed by the woman.'

complements and the ERG value of the embedded verb are raised. The resulting verbal complex is embedded under *werden*. The ERG value of *zu reparieren versucht* which is the object of *reparieren*, i.e. *der Wagen*, becomes the subject of the resulting verbal complex.

Note that in entries of control verbs like (24) just the index of the controller and the controlee are shared. This especially is important for object control verbs like *erlauben*. The entry for *erlauben* is shown in (25).

erlauben (object control verb, incoherent version):

$$(25) \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{SUBJ} \langle \text{NP}[\textit{str}] \rangle \\ \text{ERG} \langle \rangle \\ \textit{verb} \end{array} \right] \\ \text{SUBCAT} \left\langle \begin{array}{l} \text{NP}[\textit{dat}]: \boxed{1} \\ \text{VP}[\textit{inf}, \textit{LEX-}, \textit{SUBJ} \langle \text{NP}[\textit{str}]: \boxed{1} \rangle, \text{SUBCAT} \langle \rangle] \end{array} \right\rangle \oplus \\ \text{VCOMP} \textit{none} \\ \textit{cat} \end{array} \right]$$

With such an entry, it can be explained why the case of the dative object and the controlled subject differs.

- (26) , weil ich den Männern erlaubt habe, einer nach dem anderen
 because I the men_{dat} allowed have one_{nom,mas} after the other
 wegzulaufen.
 to.run.away
 ‘because I allowed the men to run away one after the other.’

If the object of *erlauben* were identical to the subject of *weglaufen*, sentences like (26) would be ruled out.

Finally, let us consider the entry for an AcI verb.

sieht:

$$(27) \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{SUBJ} \langle \rangle \\ \textit{verb} \end{array} \right] \\ \text{SUBCAT} \text{NP}[\textit{str}] \oplus \boxed{2} \oplus \boxed{3} \\ \text{VCOMP} \text{V}[\textit{bse}, \textit{LEX+}, \textit{SUBJ} \boxed{2}, \text{SUBCAT} \boxed{3}] \\ \textit{cat} \end{array} \right]$$

Sehen does not assign a role to the subject it raises. The embedding of unpersonal constructions is possible.¹⁹

¹⁹The impossibility of the embedding of passive structures is not due to the absence of a subject in the embedded verbal complex as (i) might suggest.

- (i) * Er sah geschlampt werden.
 Intended: ‘He saw sloppy work being done.’
- (ii) a. * Er sah die Frau geliebt werden.
 Intended: ‘He saw the woman being loved.’
 b. * Er sah den Mann das Buch gelesen haben.
 Intended: ‘He saw the man having read the book.’

See (Höhle, 1978, p. 172) for other examples.

(28) a. ? Ich sah ihm schlecht werden.²⁰

I saw him_{dat} feel.sick become
'I saw him getting sick.'

b. Ich sah es regnen.

I saw it rain

The entry in (27) admits the sentences in (28). In (28a) the value of SUBJ is the empty list. In (28b) it is the expletive. But, as there are no restrictions on the SUBJ value, both values are fine. This entry is more general than the entry Heinz and Matiasek (1994, p. 231) give. Their entry embeds a verb phrase with a subject. While Heinz and Matiasek can, in principle, assume a second entry for *sehen*, I think the entry in (27) captures the generalization about the subject of the embedded verbal complex in a more direct way. Another difference from the lexical entry of Heinz and Matiasek is that I treat AcI verbs as verbs that construct coherently.²¹ So, all arguments of the verbal complex embedded under a AcI verb are realized by the matrix verb. In (29), *den Mann* and *den Wagen* are raised from *reparieren*.

(29) Er sieht den Mann den Wagen reparieren.

he sees the man_{acc} the car_{acc} repair
'He sees the man repairing the car.'

As the case of *den Wagen* cannot be assigned lexically, since then remote passive could not be accounted for, it has to be assigned by the finite verb *sieht*. This means that the case principle has to assign structural accusative to all dependents of a verb or adjective that are different from the subject.

Note that the lexical entry for *sehen* correctly predicts the ungrammaticality of (30b).

(30) a. Der Wächter sah die Männer einen nach dem anderen weglaufen.

the guardian saw the men_{acc} one_{acc} after the other run.away
'The guardian saw the men run away one after the other.'

b. * Der Wächter sah die Männer einer nach dem anderen weglaufen.

the guardian saw the men_{acc} one_{nom} after the other run.away

As the object of *sehen* and the subject of *weglaufen* are structure shared, the subject of *weglaufen* has the same case as the object of *sehen*, namely accusative. It is therefore correctly predicted that it is not possible to refer with *einer nach dem anderen* to a nominative subject of *weglaufen*.

4 The Case Principle

For the feature case, I assume the internal structure shown in (31).²²

(31)
$$\left[\begin{array}{l} \text{CASE-TYPE } \textit{case-type} \\ \text{SYN-CASE } \textit{syn-case} \\ \textit{case} \end{array} \right]$$

²⁰Cf. (Pollard, 1994, p. 279) and (Kiss, 1995, p. 12).

²¹See (Bech, 1955) for evidence for this assumption.

²²In (Müller, 1998), I assume an additional feature MORPH-CASE which is used to describe case phenomena in free relatives. I omit this feature here because it is irrelevant to the present discussion.

Abb (1994, p. 49) also assumes a separate feature for the case type. But he gives no explanation for this and does not relate it to the *Kongruenzkasus* phenomenon.

case-type is partitioned in *structural* (*str*) and *lexical* (*lex*). The type *syn-case* is partitioned into the four morphological cases nominative, genitive, dative and accusative.

I use complex types like those in (32) and (33)

(32) $\left[\begin{array}{l} \text{SYN-CASE } \textit{nom} \\ \textit{nom-c} \end{array} \right]$

(33) $\left[\begin{array}{l} \text{CASE-TYPE } \textit{structural} \\ \textit{structural-c} \end{array} \right]$

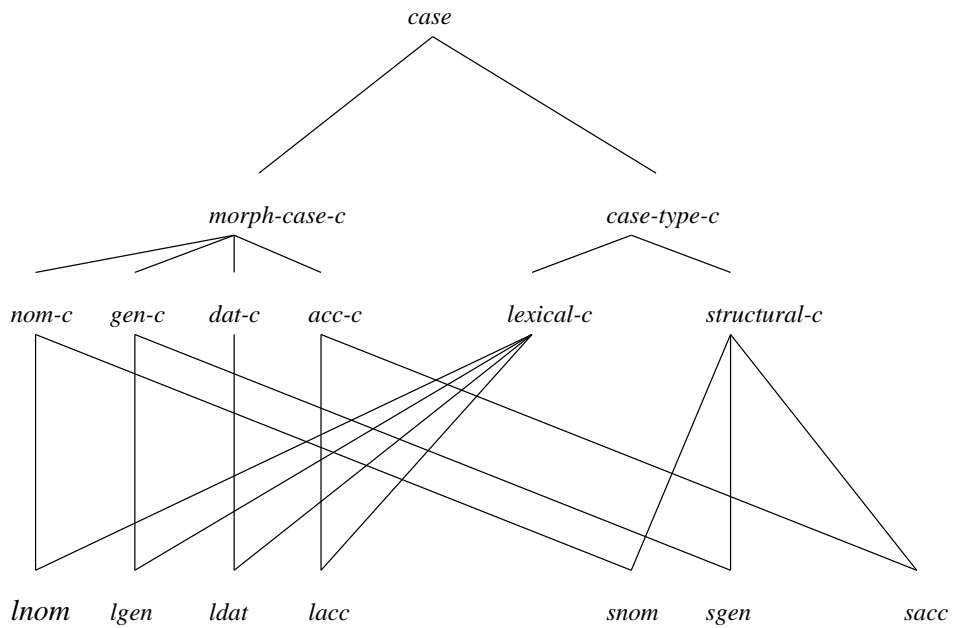


Figure 1: Complex Subtypes of the Type *case*

Figure 1 shows how types for structural nominative (*snom*) and lexical dative (*ldat*) inherit from their supertypes.

(34) $\left[\begin{array}{l} \text{CASE-TYPE } \textit{structural} \\ \text{SYN-CASE } \textit{nom} \\ \textit{snom} \end{array} \right]$

(35) $\left[\begin{array}{l} \text{CASE-TYPE } \textit{lexical} \\ \text{SYN-CASE } \textit{dat} \\ \textit{ldat} \end{array} \right]$

The following principle can account for the data presented in section 2.^{23,24}

Principle 1 (Case Principle)

$$a \quad \left[\begin{array}{l} \text{SYNSEM} \left[\text{LOC|CAT|HEAD} \left[\begin{array}{l} \text{VFORM } \mathit{fin} \\ \mathit{verb} \end{array} \right] \right] \\ \text{DTRS} \left[\begin{array}{l} \text{H-DTR|SYNSEM|LOC|CAT|SUBCAT} \langle \text{NP}[\mathit{str}] \rangle \oplus \boxed{1} \\ \mathit{head-comp-structure} \end{array} \right] \end{array} \right] \Rightarrow$$

$$\left[\text{DTRS|H-DTR|SYNSEM|LOC|CAT|SUBCAT} \langle \text{NP}[\mathit{snom}] \rangle \oplus \boxed{1} \right] \wedge$$

$$b \quad \left[\begin{array}{l} \text{SYNSEM} \left[\text{LOC|CAT|HEAD} \left[\begin{array}{l} \text{VFORM } \mathit{fin} \\ \mathit{verb} \end{array} \right] \right] \\ \text{DTRS} \left[\begin{array}{l} \text{H-DTR|SYNSEM|LOC|CAT|SUBCAT} \langle [\mathit{synsem}] \rangle \oplus \boxed{1} \oplus \\ \langle \text{NP}[\mathit{str}] \rangle \oplus \boxed{2} \\ \mathit{head-comp-structure} \end{array} \right] \end{array} \right] \Rightarrow$$

$$\left[\begin{array}{l} \text{DTRS|H-DTR|SYNSEM|LOC|CAT|SUBCAT} \langle [\mathit{synsem}] \rangle \oplus \boxed{1} \oplus \\ \langle \text{NP}[\mathit{sacc}] \rangle \oplus \boxed{2} \end{array} \right] \wedge$$

$$c \quad \left[\begin{array}{l} \text{SYNSEM} \left[\text{LOC|CAT|HEAD} \left[\begin{array}{l} \text{SUBJ} \langle [\mathit{synsem}] \rangle \\ \mathit{adj} \vee \mathit{verb} \end{array} \right] \right] \\ \text{DTRS} \left[\mathit{head-comp-structure} \right] \end{array} \right] \Rightarrow$$

$$\left[\text{SYNSEM} \left[\text{LOC|CAT|HEAD|SUBJ} \langle \text{NP}[\mathit{snom}] \rangle \right] \right] \wedge$$

²³This principle can be simplified if case is assigned on ARG-S (see (Müller, 1997a)). ARG-S stands for argument structure. The value of ARG-S is the concatenation of the SUBJ and the COMPS or SUBCAT value. Argument attraction would then have to take place on SUBCAT and on ARG-S. Nominative is assigned to an element at the first position of ARG-S if the element has structural case. Accusative is assigned to all other elements that have structural case. I did not follow this approach in this paper for reasons of readability: the argument attraction with both subcat and ARG-S list is hardly readable.

For a different proposal for case assignment on ARG-S see (Przepiórkowski, To appear).

²⁴Inside the GB framework, Thiersch (1978, p. 54) formulated a similar case principle for verbal environments. His case principle assigned nominative to a noun phrase with structural case that was marked by its position and accusative to all other noun phrases with structural case.

$$\begin{array}{l}
\text{d} \left[\begin{array}{l} \text{SYNSEM} \left[\text{LOC|CAT|HEAD} \left[\text{SUBJ} \langle [synsem] \rangle \right] \right. \\ \left. \left. \begin{array}{l} adj \vee verb \\ \text{DTRS} \left[\text{H-DTR|SYNSEM|LOC|CAT|SUBCAT} \boxed{1} \oplus \langle \text{NP}[str] \rangle \oplus \boxed{2} \right] \right. \\ \left. \left. \begin{array}{l} head-comp-structure \end{array} \right] \right] \end{array} \right] \Rightarrow \\ \\ \left[\text{DTRS} \left[\text{H-DTR|SYNSEM|LOC|CAT|SUBCAT} \boxed{1} \oplus \langle \text{NP}[sacc] \rangle \oplus \boxed{2} \right] \right] \wedge \\ \\ \text{e} \left[\begin{array}{l} \text{SYNSEM} \left[\text{LOC|CAT|HEAD} [noun] \right] \\ \text{DTRS} \left[\text{H-DTR|SYNSEM|LOC|CAT|SUBCAT} \langle [synsem], \text{NP}[str] \rangle \oplus \boxed{1} \right] \right] \Rightarrow \\ \\ \left[\text{DTRS|H-DTR|SYNSEM|LOC|CAT|SUBCAT} \langle [synsem], \text{NP}[sacc] \rangle \oplus \boxed{1} \right]
\end{array}
\end{array}$$

The implication a assigns nominative to the subject of finite verbs. Implication b assigns accusative to all non-subject elements of the subcat list of a finite verb that have structural case. Implication c assigns case to subjects if the head is an adjective or an infinite verb. Implication d assigns case to objects if the head is an adjective or an infinite verb. Note that the implications above handle the case assignment in AcI constructions in the right way. So in the analysis of (29) both accusative NPs are raised to objects of the finite verb and receive case by implication b. The approach of Heinz and Matiasek does not assign case to the second raised object and therefore ungrammatical sentences would be permitted by their analysis. The implication e assigns case in nominal environments.²⁵

The lexical entry for *nennen* that can explain the data presented in section 2.2 is shown in (36).

$$(36) \quad \begin{array}{l} \text{nennen:} \\ \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{SUBJ} \langle \text{NP}[str] \rangle \\ \text{ERG} \langle \boxed{1} \rangle \\ verb \end{array} \right] \\ \text{SUBCAT} \langle \boxed{1} \text{ NP}[str, \text{SYN-CASE} \boxed{2}], \text{NP}[lex, \text{SYN-CASE} \boxed{2}] \rangle \\ cat \end{array} \right]
\end{array}$$

The subcat list of the finite verb in the sentence (13a) has the form in (37a) and the subcat list of the passive sentence (13b) has the form in (37b).

$$(37) \quad \text{a.} \quad \langle \text{NP}[str], \text{NP}[str, \text{SYN-CASE} \boxed{2}], \text{NP}[lex, \text{SYN-CASE} \boxed{2}] \rangle$$

²⁵Note that this formulation of the principle assumes an NP analysis. For bare plurals like (i) there must be a determiner on the subcat list for the case principle to work.

- (i) Bombardierungen verschiedener deutscher Städte
bombings several German cities
‘bombings of several German cities’

This could be changed easily if determiners were selected via SPR as suggested by Pollard and Sag (1994, Chapter 9). This would make an additional schema for head specifier structures that is not needed elsewhere in the German grammar necessary.

b. $\langle \text{NP}[\text{str}, \text{SYN-CASE } \boxed{2}], \text{NP}[\text{lex}, \text{SYN-CASE } \boxed{2}] \rangle$

During the analysis of (13a), the first element of the subcat lists gets nominative and the second one accusative. As the third element has lexical case, it does not receive case by the case principle. Via structure sharing it is ensured that the third element agrees with the second element in case. The analysis of (13b) is similar. The first element receives nominative and the second element agrees with the first. Note that a structure sharing of the complete case values would rule out (13b), since then the second element would have structural case and the case principle assigned accusative, which would lead to a unification failure.

5 Case Assignment to Non-realized Dependents

The case assignment to non-realized dependents of intransitive verbs and adjectives that do not take complements is not explained yet. Case is assigned in head complement structures. If an intransitive verb is seen as a saturated verb phrase it can be embedded without any head complement projection.

- (38) Die Männer haben versucht, einer nach dem anderen wegzulaufen.
the men have tried one_{nom} after the other to.run.away
'The men tried to run away one after the other.'

To solve this problem, one could assume a unary projection like the one proposed by Pollard and Sag (1994, p. 32, fn. 32) that projects saturated lexical items to phrases. An alternative would be to assume an empty element that is saturated by adjectives and infinitives.

Note that it is not a solution to the problem to assume a lexical assignment of case to all subjects as (39) is possible.

- (39) Die Männer versuchen, einer nach dem anderen befördert zu werden.
the men try one_{nom} after the other promoted to become
'One after the other the men try to get promotions.'

In (39), the logical object of *befördern* is raised to the subject of *werden*. This subject is controlled by *versuchen*. The verbal complex *befördert zu werden* behaves like an intransitive verb, i.e. there is no head complement structure in the phrase *einer nach dem anderen befördert zu werden*.

For the same reason the nominative of adjectives cannot be assigned lexically.

- (40) Karl sah den Mond kleiner werden.
Karl saw the moon_{acc} smaller become
'Karl saw how the moon got smaller.'

In (40) the subject of *kleiner* is raised by the copula *werden* the arguments of *kleiner werden* then are attracted by *sah*. As an object of *sah* the noun phrase *the moon* gets accusative.

However, one could assign the nominative to prenominal adjectives in the lexical rule that creates them and let governing verbs in incoherent constructions assign the nominative to the subject of their verb phrase complements.

For the time being, I opt for the unary projection in order to handle the case assignment for predicative and non-predicative adjectives in a uniform way.

6 Case Assignment and Extraction

The lexical analysis for extraction that was proposed by Pollard and Sag (1994, Chapter 9) is incompatible with the case assignment approach presented here. This was noted in (Müller, 1994). In (Müller, 1997a), I developed an approach for case assignment on argument structure (ARG-S). The argument attraction that takes place in the lexical entries for passive and perfect auxiliaries then takes place both on subcat and on ARG-S. Przepiórkowski (To appear) made a similar proposal but he used an additional feature *REALIZED* to distinguish realized from non-realized constituents. If a complement is realized in the syntactic environment of a head, the head assigns case to it.

I think although the case assignment on ARG-S is technically possible, case should be treated as a syntactic phenomenon. Therefore I assume that nonlocal dependencies are not introduced by a lexical rule but rather by a unary branching schema. This schema is a part of the syntactic component of a grammar. Complements are extracted after the formation of the verbal complex. Therefore it is clear in which particular syntactic environment they surface and which case has to be assigned to them.

In general, I believe that lexical rules should be used if morphological changes on the element the rule is applied to can be seen. All other phenomena should be treated by the syntax proper and should be handled by dominance schemata.

7 Alternatives

7.1 Heinz and Matiasek (1994)

With a feature geometry for the feature *CASE* like the one suggested in section 4, it is possible to specify case identity via structure sharing of the *SYN-CASE* features. Such a structure sharing does not imply that the case type is identical. If one were to assume a single case feature and an integration of the case type in the type hierarchy like Heinz and Matiasek (1994) did, a structure sharing would enforce the identity of both the case value and the case type. With a type hierarchy like the one shown

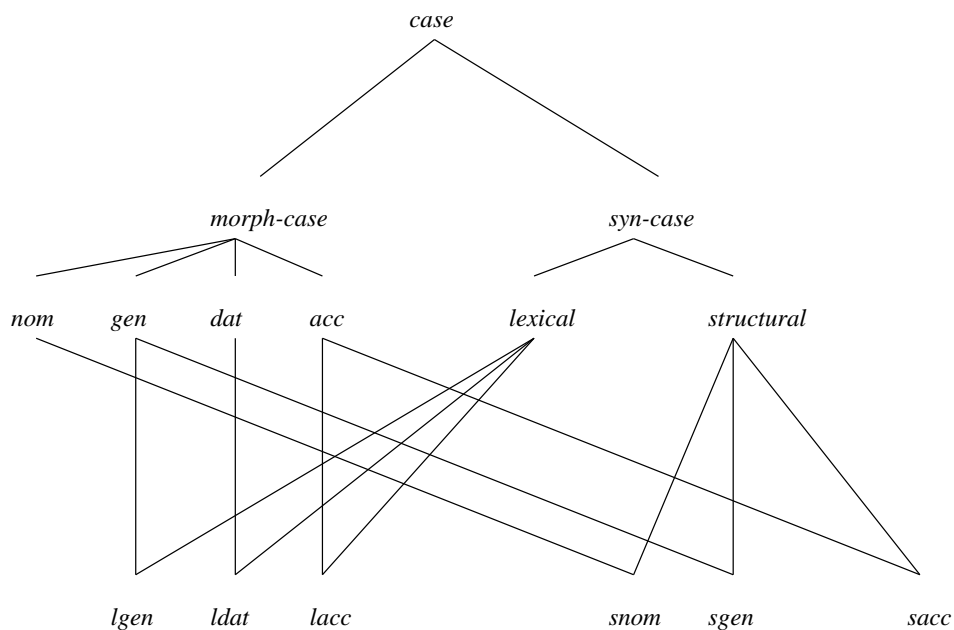


Figure 2: Subtypes of the Type *case* following Heinz and Matiasek (1994)

in figure 2 it is impossible to express the generalization that the prepositional complement in (14)—repeated here as (41) for convenience—is identical to the case of the nominal object, since the case of prepositions is always lexical.

- (41) a. Ich sehe ihn als meinen Freund an.²⁶
 I see him_{acc} as a friend_{acc} PRFX
 ‘I regard him as my friend.’
- b. Er wird als mein Freund angesehen.
 he_{nom} is as my friend_{nom} seen
 ‘He is regarded as a friend of mine.’

The case principle of Heinz and Matiasek differs in two respects from the one given above. First, they do not make a distinction between the subject of finite verbs and the subject of finite verbs: both subjects appear on the subcat list. Their case principle therefore can be formulated with three implications. However, without using a SUBJ feature one has to treat verb phrases as partly saturated projections. Generalizations with regard to modification and extraposition cannot be expressed easily anymore without a proper notion of phrase. Like verb phrases adjective phrases will not be maximal projections. Therefore one has to distinguish between saturated modifiers like relative clauses and unsaturated modifiers like adjectives.²⁷

Case Principle of Heinz and Matiasek (1994)²⁸

$$\begin{array}{l}
 \text{a} \left[\begin{array}{l} \text{SYNSEM} \left[\text{LOC|CAT} \left[\text{HEAD} \left[\begin{array}{l} \text{VFORM} \textit{fin} \\ \textit{verb} \end{array} \right] \right] \right] \\ \text{SUBCAT} \langle \rangle \end{array} \right] \\ \text{DTRS} \left[\text{H-DTR|SYNSEM|LOC|CAT|SUBCAT} \langle \text{NP}[\textit{str}], \dots \rangle \right] \\ \textit{head-comp-structure} \end{array} \right] \Rightarrow \\
 \\
 \left[\text{DTRS|H-DTR|SYNSEM|LOC|CAT|SUBCAT} \langle \text{NP}[\textit{snom}], \dots \rangle \right] \wedge \\
 \\
 \text{b} \left[\begin{array}{l} \text{SYNSEM} \left[\text{LOC|CAT} \left[\text{HEAD} \left[\textit{verb} \right] \right] \right] \\ \text{SUBCAT} \langle \rangle \vee \langle [\textit{synsem}] \rangle \end{array} \right] \\ \text{DTRS} \left[\text{H-DTR|SYNSEM|LOC|CAT|SUBCAT} \langle [\textit{synsem}], \text{NP}[\textit{str}], \dots \rangle \right] \\ \textit{head-comp-structure} \end{array} \right] \Rightarrow \\
 \\
 \left[\text{DTRS|H-DTR|SYNSEM|LOC|CAT|SUBCAT} \langle [\textit{synsem}], \text{NP}[\textit{sacc}], \dots \rangle \right] \wedge
 \end{array}$$

Another difference is that the case principle of Heinz and Matiasek cannot handle the case assignment in ACI constructions in the right way. The only way that the second accusative in (29) can get case in

²⁶(von Stechow and Sternefeld, 1988, p. 154)

²⁷See (Kiss, 1995, Chapter 3.2.4) for a detailed discussion of the advantages of the SUBJ feature.

²⁸Their implication for nominal environments is not given here. It is identical to the implication e as stated above.

their analysis would be to assume that *sehen* (*see*) takes a VP complement which is empirically wrong. The implications above fail to assign structural accusative in coherent constructions that contain two objects with structural case as only elements at the second position of the subcat list get accusative.

7.2 Lebeth (1994)

Lebeth (1994) gives a case principle that assigns nominative to a complement if it is in an agreement relation with the verb. He stipulates an agreement feature for verbs that has as part of its value the index of the element that is in agreement with the verb or *non-ref* if it is an impersonal construction. In a verb complement structure nominative is assigned to a NP with structural case iff the index of the complement unifies with or is identical to the specified element in the agreement value of the verb (see figure 3). If the index of the complement does not unify or is not identical, accusative is assigned (see figure 4). This case principle clearly fails on sentences like (42).

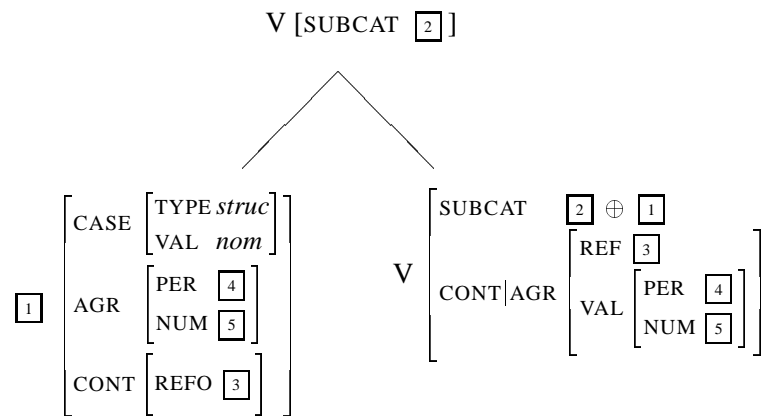


Figure 3: Nominative Assignment following Lebeth (1994)

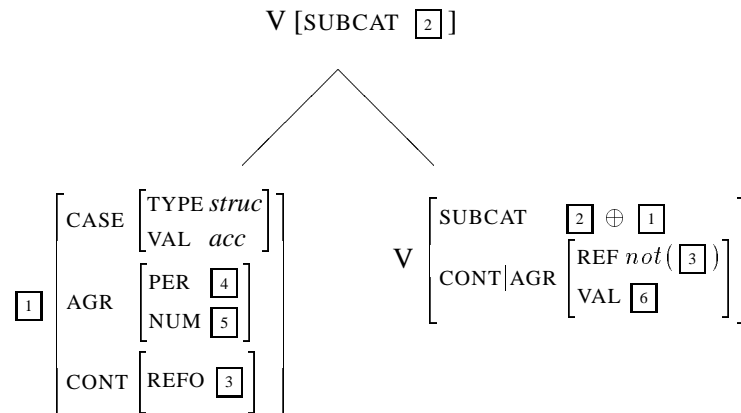


Figure 4: Accusative Assignment following Lebeth (1994)

- (42) Karl_i kennt sich_i.
 Karl knows himself_{acc}

Both complements of *kennen* (*know*) have structural case. The indices of both noun phrases are identical. If the above principle is applied both phrases receive nominative and (42) would be ruled out.

Lebeth claims that the nominative in sentences like (12) is structural and that his case principle assigns the right case since the copula enforces a structure sharing of the indices of the two nominative NPs. Such a lexical entry for a copula would not be appropriate for sentences like (43).

- (43) a. Karl behauptet, daß Peter der neue Hausmeister ist.
'Karl claims that Peter is the new caretaker.'
- b. Daß Peter der neue Hausmeister ist, ist nicht wahr.
'That Peter is the new caretaker is not true.'
- c. Peter behauptet, der neue Hausmeister zu sein.
'Peter claims to be the new caretaker.'

The identity relation is part of the semantic contribution of the copula and can be embedded under intentional predicates or be negated. If the copula enforced the structure sharing there would be no way to get a well-formed semantic representation for sentences like (43).

8 Problems

A problem that was already mentioned in (Müller, 1997b) is the case assignment in sentences like (44).

- (44) a. ? Den Sänger jodeln läßt der König.²⁹
the singer_{acc} yodel lets the king_{nom}
'The king lets the singer yodel.'
- b. * Der Sänger jodeln läßt der König.²⁹
the singer_{nom} yodel lets the king_{nom}

The fronting of the subject together with the infinite verb could be explained if one assumes—as for instance Kathol (1995) does—that the subject is listed on the subcat list of both finite and non finite verbs. However, this is not sufficient to explain why the subject in (44) has accusative case.

9 Conclusion

The case theory of Heinz and Matiasek (1994) has been considerably improved. The feature CAS is assumed to be a complex feature structure instead of an atomic one in order to handle the *Kongruenzkasus* phenomenon. Evidence for the existence of lexical nominative has been provided. The case principle has been extended and generalized in such a way that the assignment of case in coherent constructions and adjectival environments works properly. The assignment of case to non-realized dependents has been integrated into the principle.

The analysis is part of an implemented fragment of German (Müller, 1996).

²⁹(Oppenrieder, 1991, p. 57)

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