

A GPSG Analysis of Case Agreement in German

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1. Introduction

It is the purpose of this paper to explore the potential of a phrase structure grammar proposed by Gazdar, Klein, Pullum and Sag (GKPS) to account for case agreement in German. Firstly, I will review the data which includes both literary and conventional forms, and then proceed to the analysis, concluding with a brief evaluation of this approach.

2. Case and Lexical Qualities of Verbs and Prepositions

German has 4 cases: the nominative, the accusative, the dative, and the genitive. Prepositions and certain verbs require that their complements take a specific case. Verbs such as *werden* ‘to become’ require that their complements take the nominative case:

Der Fürst wird ein grüner Frosch.

‘The prince became a green frog.’

[_{NPnom} Der Fürst] [_V wird] [_{NPnom} ein grüner Frosch]

Verbs such as *nennen* ‘to name’ require that their complements take the accusative case:

Der grüne Frosch nennt den Grund für die Verwandlung.

‘The green frog mentions the reason for the change.’

[_{NPnom} Der grüne Frosch] [_V nennt] [_{NPacc} den Grund [_{PP} für die Verwandlung]]

The dative case is required for the complements of verbs such as *glauben* ‘to believe’:

Die Fürstin glaubt dem grünen Frosch nicht.

‘The princess does not believe the green frog.’

[_{NPnom} Die Fürstin] [_V glaubt] [_{NPdat} dem grünen Frosch] [_{neg} nicht]

The genitive case is required for the complements of verbs such as *gedenken* ‘to think of’:

Sie gedenkt ihres hübschen Fürsten und weint.

‘She thinks of her handsome prince and cries.’

[NP_{nom} Sie] [V_v gedenkt] [NP_{gen} ihres hübschen Fürsten] [conj und [V_v weint]]

In German there are, however, only a few verbs that require a specific case, whereas all prepositions require that their complements take a specific case. In fact, prepositions can be divided into groups by these cases:

Accusative Prepositions:

bis	‘until’
durch	‘through’
für	‘for’

e.g. für den grünen Frosch ‘for the green frog’

[PP[P für] [NP_{acc} den grünen Frosch]]

Dative Prepositions:

mit	‘with’
seit	‘since’
zu	‘to’

e.g. mit dem grünen Frosch ‘with the green frog’

[PP[P mit] [NP_{dat} dem grünen Frosch]]

Genitive Prepositions:

anstatt	‘instead of’
während	‘during’
wegen	‘because of’

e.g. anstatt des grünen Frosches ‘instead of the green frog’

[PP[P anstatt] [NP_{gen} des grünen Frosches]]

There are a group of prepositions whose complements take either the dative or the accusative case:

Dative/Accusative Prepositions:

in	‘in’
an	‘at’
über	‘over’

e.g. Der grüne Frosch wohnt in dem Teich.

'The green frog lives in the pond.'

[_{PP}[_P in] [_{NPdat} dem Teich]]

versus:

Der grüne Frosch springt in den Teich.

'The green frog jumps into the pond.'

[_{PP}[_P in] [_{NPacc} den Teich]]

It is apparent that the accusative case reflects a directed action, and the dative, a state.

2.1 Case and Grammatical Functions

In German, case also accounts for grammatical functions. The nominative expresses the subject, the accusative expresses the object, and the dative expresses the indirect object:

Die Fürstin gibt dem Bettler den grünen Frosch.

'The princess gives the green frog to the beggar.'

[_{NPnom} Die Fürstin] [_V gibt] [_{NPdat} dem Bettler] [_{NPacc} den grünen Frosch]

Given these examples, case, for the most part, reflects grammatical function as well as a lexical property of prepositions and some verbs.

2.2 Case marking of Determiners and Adjectives

Once the case of an NP has been determined, it is necessary for the determiner and the adjectives of that NP to agree in case, otherwise it is ungrammatical:

Eine Herzogin hat den hübschen Fürsten geküsst.

[_{NPacc}[_{DETacc} den] [[_{ADJacc} hübschen] [_N Fürsten]]]

* Eine Herzogin hat dem hübschen Fürsten geküsst.

[_{NPacc}[*_{DETdat} dem] [[_{ADJacc} hübschen] [_N Fürsten]]]

'A duchess kissed the handsome prince.'

* Die Herzogin hat manch hübscher Fürsten geküsst.

[_{NPacc}[_{DETacc} manch] [[*_{ADJgen} hübscher] [_N Fürsten]]]

'The duchess kissed many handsome princes.'

It is important to note that word order seems to affect the marking for case. If an adjective is prenominal, it must be marked for case as we have seen above. However, if it is postnominal, it is not marked:

die schönste Herzogin 'the most beautiful duchess'

[_{NPacc}[_{DETacc} die] [[_{ADJacc} schönste] [_N Herzogin]]]

die Herzogin schönst 'the duchess, most beautiful'

[_{NPacc}[_{DETacc} die] [_N Herzogin] [_{ADJ} schönst]]

It is not the case that only determiners and adjectives must agree in case within an NP; there are some nouns which reflect case.

2.3 Case Marking and Nouns

In German, most nouns in the genitive singular and in the dative plural reflect case:

Genitive singular (non feminine):

des grünen Frosches 'the green frog'

[_{NPgen}[_{DETgen} des] [[_{ADJgen} grünen] [_{Ngen} Frosches]]]

Dative plural (non feminine):

den grünen Fröschen 'to the green frogs'

[_{NPdat}[_{DETdat} den] [[_{ADJdat} grünen] [_{Ndat} Fröschen]]]

In addition to this group of nouns which reflect case, there is another which is also marked for case. However, it is only the singular non-nominative forms which reflect case:

Die Herzogin verlockt den Fürsten mit dem Reichtum.

'The duchess tempts the prince with riches.'

[_{NPacc} [_{DETacc} den] [_{Nacc} Fürsten]]

This group of nouns is very small in number.

The data reveals that case is assigned to an NP either by a lexical virtue of the preposition or verb, or it is assigned according to the grammatical function of that NP. However, there are some prepositions which are able to assign two cases. The determiners, prepositions, and adjectives of an NP must agree in case; and also, there appears to be some form of case agreement evident in nouns.

3. Case in the VP

According to Zwicky (1986), there are three approaches of case assignment to the complement NP's of a VP, subcategorization, agreement, and the stipulated feature approach. He argues on the basis of government that these approaches fail, and proposes his own version of the stipulated feature approach. This, in addition to the mechanisms of Declension Government (DG) and Declension Inheritance (DI), can account for case agreement between the constituents, DET and ADJ (Zwicky 1986:985). However, in this paper I will not be discussing the phenomenon of DET ADJ agreement in German, and I refer the reader to either Zwicky (1986), or Fenchel (ND) for a discussion in this area.

Zwicky's version of the stipulated feature approach differs a great deal from the GKPS framework which I will adopt in this paper. And in addition, DG and DI fail to offer any advantage over the Head Feature Convention (HFC) and the Control Agreement Principle (CAP) of GKPS. Therefore, I propose a GKPS approach to case agreement in German which in some ways resembles a combination of the subcategorization and the agreement approaches.

3.1 ID Rules for Grammatical Function

The ID rule for transitive VP's in GKPS (VP -> H[2], NP) and the Feature Specification Default (FSD) 10 ([+N,-V,Bar 2] iff [acc]) can account for transitive VP's in German. For example, consider the transitive VP in this sentence:

Der Bettler trug den grünen Frosch nach Hause.

'The beggar carried the green frog home.'

The projection of the ID rule would be the following:

[_{VP} [_V tragen] [_{NP} der grüne Frosch]]

And, the FSD 10 will ensure that the NP will be marked for the accusative case given that no other principles of the grammar apply:

[_{NP[acc]} den grünen Frosch]

The ditransitive verb ID rule can also be adopted with one adjustment. As shown in the data, case can express grammatical function, so a PP is not necessary to express the indirect object. The marking of NP for the dative case has the same effect. Then, the ditransitive ID rule for German would be:

VP -> H[3], NP[dat], NP

This ID rule in addition to the FSD 10 licenses a grammatical sentence like the following:

Der Bettler gab dem grünen Frosch den magischen Hut.

'The beggar gave a magic hat to the green frog.'

The projection of this rule would be:

[_{VP[V geben]} [_{NP[dat]} dem grünen Frosch] [_{NP} der magische Hut]]

Again, the FSD 10 will ensure that the unmarked NP will be marked for the accusative case:

[_{NP[acc]} den magischen Hut]

3.2 ID Rules for Lexical Case

Those verbs whose lexical properties require either the dative or genitive cases can also be dealt with in a similar manner (Uszkoreit 1987). V's can be categorized by the cases they require of their complements. And, these are identified by different subcat values:

VP -> V[51], NP[dat]

VP -> V[52], NP[gen]

These ID rules license the following grammatical sentences:

Der grüne Frosch dankte dem Bettler.

'The green frog thanked the beggar.'

Aber der Hut entbehrte des Zaubers.

'But the hat lacked magic.'

The ID rule: $VP[+aux] \rightarrow H[7]$, $XP[+pred]$ can also be used to account for VP's taking a predicate complement in German.

Der grüne Frosch wurde kein hübscher Fürst.

'The green frog did not become a handsome prince.'

$[VP [V \text{ werden}] [NP \text{ ein hübscher Fürst}]]$

However, there must be an additional FCR to account for the lack of case marking on the $NP[+pred]$:

FCR 23:[+pred,+N] then *not* [case]

This FCR will override FSD 10 preventing the assignment of the accusative case.

3.3 Prepositions and Case

The assignment for the case of the NP complements of prepositions can be treated much the same way as it has been for verbs. The ID rule for prepositions with the subcat value of [39] is not required in German as the preposition, *aus* 'out of' requires an NP as its complement. The ID rule: $P^1 \rightarrow H[38]$, NP in combination with FSD 10 can account for those prepositions which take the accusative case:

durch den Heroismus 'by means of heroism'

$[PP[P \text{ durch}] [NP \text{ der Heroismus}]]$

FSD 10 will ensure that the NP takes the accusative case.

$[NP[acc] \text{ den Heroismus}]$

It is necessary to propose two additional ID rules to account for the prepositions taking the dative or the genitive case:

$P^1 \rightarrow H[60], NP[\text{dat}]$

$P^1 \rightarrow H[61], NP[\text{gen}]$

These ID rules act much like those for lexical verbs which specify for a particular case. They ensure the following grammatical PP's:

mit einer guten Tat ‘with a good deed’

$[PP[P \text{ mit}] [NP[\text{dat}] \text{ einer guten Tat}]]$

innerhalb eines Tages ‘within one day’

$[PP[P \text{ innerhalb}] [NP[\text{gen}] \text{ eines Tages}]]$

3.4 Prepositions taking Accusative/Dative

To account for these prepositions additional ID rules cannot be proposed within this framework. Instead, they can be considered lexically distinct even though their phonological realizations are the same. Given this assumption the ID rules for subcat [38] and [60] will account for these cases.

By proposing additional ID rules and an FCR 23, the NP complement of V's and of P's can be appropriately marked for case. It appears that subcategorization can correctly account for case assignment in German. However, as Zwicky (1986) points out there are problems with this approach. He argues that distinct subcat frames for words that can be realized as phonologically identical cannot be treated as identical in coordination.

This phenomenon does not occur with the prepositions, but it does occur in the coordination of VP's with distinct subcat frames:

Der Fürst findet und hilft Herzoginnen.

‘The prince finds and helps duchesses.’

Herzoginnen, in this case, is one phonological realization, but is the complement of two V's of differing subcat values, *helfen* which takes a dative NP, and *finden* which allows the NP to default to the accusative.

However, a potential solution for this problem is to assume the same stance that was taken with phonologically identical prepositions. Although *Herzoginen* is one phonological realization, it does not appear necessary to assume that it is one lexical element. Like *aus*, *Herzoginnen* can be realized as two lexically distinct NP's.

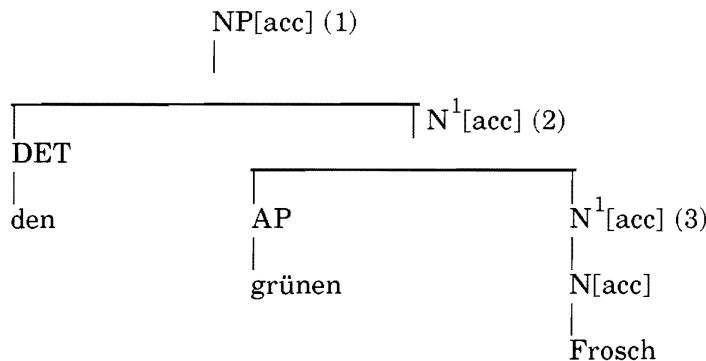
4. Agreement within the NP

Once the NP has been assigned case it is necessary to distribute this feature within the NP. As the data reveals, the determiner and the adjective both must reflect case. GKPS provides two mechanisms, HFC and CAP that can instantiate this feature on the necessary nodes of the NP.

4.1 Case and the HFC

GKPS specifies that case is a head feature, and is thereby subject to the HFC. I am assuming that the head of the NP is in fact the lexical head N, contrary to some proposals.

Fenchel and others have proposed a hydra construction for the NP where both the DET and N are heads. However, this has been introduced to account for DET ADJ agreement with which I am not concerned in this paper. Fenchel (ND), Uszkoreit (1986), and Kuh (1988) assume in their analyses that the HFC can account for the marking of case along the head path. Consider the following tree:



In the first local tree (1), the HFC ensures that the mother and the head of this tree agree in head feature specifications as there are no other principles in the grammar that prevent the head daughter from having this feature specification. This also occurs in the local tree (2) and (3) ensuring that [acc] occurs on the N^1 and N nodes. Nothing in the grammar prevents the lexical head from taking this feature.

4.1.1 Lexical N and Case

The HFC distributes properties such as case along the head path including the lexical head. Zwicky (1986) claims that this is one fault of the HFC in the analysis of case agreement, because these properties are not morphologically realized on the heads of these phrases. Considering that genitive and dative nouns can reflect case as shown in the data, it becomes clear that the HFC can be instrumental in the marking of these N's.

However, it is clear that there must be constraints on [case] to allow the HFC to forgive certain lexical N's for disagreeing with their mothers. The following FCR's would prevent [case] from being in the intersection of possible head feature specifications and those of the mother allowing the head to extend its mother. The HFC then forgives the disagreement.

FCR 40: [+FEM,-GEN,+PLU,SUBCAT] then *not* [CASE]

FCR 41: [+FEM,-DAT,-PLU,SUBCAT] then *not* [CASE]

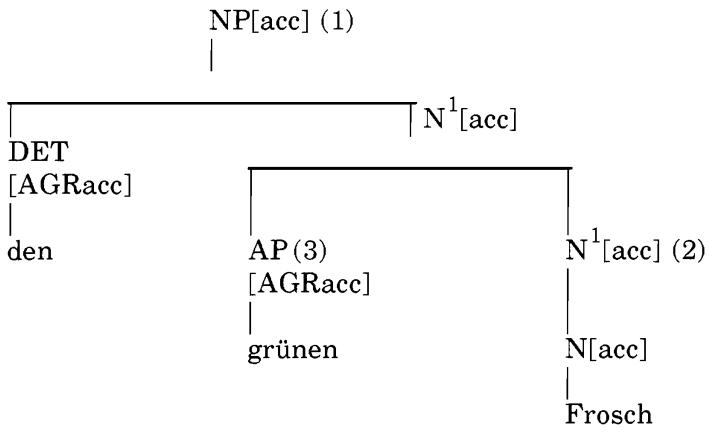
However, this is a rather ad hoc approach to the problem. It also fails to account for the very small class of nouns that inflect for all cases in the singular. It is clear that this is a problem for the analysis of case agreement in German NP's, and I leave it a topic for further research.

4.2 Case Agreement and CAP

GKPS specifies that AGR and SLASH are control features. To allow the CAP to apply within the NP, we must allow AGR to apply to DET and ADJ. However, FCR 12 ensures that only V's can take this feature. I propose that this FCR be modified as follows to ensure the appropriate nodes in NP take AGR:

Modified FCR 12: [AGR] then [+V / +DET]

The value for AGR within the NP will be [case]. Consider the following tree:



In local tree (1), the control target is DET, and N^1 is the controller given that DET is ($\text{type}(N^1)$, $\text{type}(\text{NP})$). CAP i ensures that N^1 and DET agree in [acc]. Similarly in local tree (2), N^1 and AP will agree in [acc] given that AP is ($\text{type}(N^1)$, $\text{type}(N^1)$) which specifies that N^1 is the controller

and AP is the control target. The HFC will ensure that [acc] is 'passed down' to the head of AP in local tree (3).

CAP will ensure that [acc] is properly distributed to DET and ADJ, but there is a problem with this analysis. Generally, the control target is a head, but in this case it is the non-head of the local tree that receives AGR. A stipulation is then required for CAP to work properly within the German NP. Clearly, this is another topic for further research.

5. Case and Linear Precedence

To account for the lack of case marking in postposed adjectives, Kuh (1988) proposes two linear precedence rules:

AP[AGR] precedes N

N precedes AP *not* [AGR]

The framework used here expands N^1 to AP and N^1 therefore, in adopting these LP rules in my analysis it is necessary to change N to N^1 . Then if AP follows N^1 , CAP i will not apply, for although AP is a control target, the LP overrides CAP ii, preventing AP from taking [case].

6. Summary

FSD 10 and the proposed ID rules for VP's and PP's ensure that the appropriate case is assigned to the NP complement, and FCR 23 prevents predicate NP's from being assigned [case]. HFC percolates [case] along the head path of the NP and AP, while CAP carries the feature over to the control targets, DET and AP. In the case of a postposed AP, LP rules prevent CAP from ensuring agreement between the controller and the control target, AP.

Given some alterations GKPS can provide a means of accounting for case agreement in German, however not without inherent difficulties. The HFC in combination with the proposed FCR's can account for most nouns being marked for case, but not all. Those like *Herr* which inflect for most cases in the singular have not been accounted for. In addition, the use of CAP in the German NP is rather stipulative for the control target is a non-head. It is clear that further research is necessary as this analysis and perhaps even the framework of GKPS cannot easily account for this phenomenon.

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