A Realizational Approach to Case

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Abstract

The German noun phrase generally reflects a straightforward four-way case distinction (nominative, accusative, genitive, dative), but this is most clearly realized on the determiner. Nouns show a depleted case system: genitive is only marked specifically on masculine/neuter nouns in the singular. There are several contexts which require genitive case: possessor NPs and objects of certain verbs and prepositions as well as complements to deverbal nominalizations. However, certain forms of proper names obligatorily fail to realize their genitive case in genitive contexts. Moreover, there are contexts in which even an unambiguously marked genitive singular noun is inadequate on its own and has to be accompanied by an inflected (not indeclinable!) modifier. This complex pattern of behaviour is difficult for current LFG approaches to case to handle because there is a many-many relationship between syntactic case specification and morphological case marking. I propose a realizational analysis, in which it is only NP/DPs in c-structure which are given syntactic CASE attributes. A set of f- to c-structure mapping rules define the distribution of these attributes, effectively capturing statements such as 'transitive SUBJECT is realized by ergative', 'POSSESSOR is realized by genitive' and so on. The syntactic CASE attributes are not part of lexical structure but are mapped onto morphological case-marked forms. Thus, syntactic CASE GEN is by default realized by a noun marked [Case: Gen], but not always, and not all [Case: Gen] marked elements realize CASE GEN (much less POSS).

1. Introduction[*]

This paper investigates the relationship between the formal marking of case by inflected word forms, and the syntactic functions of case. The empirical starting point is the exponence of genitive case in German. The German noun phrase generally reflects a straightforward four-way case distinction (nominative, accusative, genitive, dative), but it is only on the determiner that all four cases are distinctively realized. Nouns show a depleted case system: genitive is only marked specifically on masculine/neuter nouns in the singular.

There are several contexts which require genitive case: complements to nouns (for instance, possessor NPs) and objects of certain verbs and prepositions. In such contexts, case is canonically marked on the determiner and on the lexical noun: *die Kantaten unser-es Kapellmeister-s* 'the cantatas of our-GEN choir master-GEN'. This is also true of bare proper names (in literary registers): *die Kantaten J S Bach-s* 'the cantatas of J S Bach-GEN' (besides the more colloquial *Bachs Kantaten* or *die Kantaten von Bach*). However, proper names show complex restrictions. When a determiner or adjective modifies a proper name the noun fails to inflect: *die Kantaten unser-es/des weltbekannt-en Bach/*Bachs* 'the cantatas of our-GEN/the-GEN famous-GEN Bach'. Likewise, proper names fail to inflect after genitive-taking prepositions: *statt Bach/*Bachs* 'instead of Bach' (cf. *statt unser-es Kapellmeister-s* 'instead of our choir master'). In other words, when a noun heads a noun phrase in a genitive-case marked context, the grammar of German doesn't always require that noun to reflect

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the case marking morphologically. We see the opposite pattern when a verb selects a genitive complement. When such a complement remains unmodified the expression is ungrammatical: **Er bedarf Zuspruch-es* 'He needed consolation-GEN'. Such a construction is only grammatical if the noun is modified: *Er bedarf unser-es Zuspruch-es* 'He needed our-GEN consolation-GEN'. This is despite the fact that the form *Zuspruches* unambiguously signals genitive case (as well as singular number).

These and other mismatches between syntactic case function and morphological form show that we must separate two notions of case: syntactic and morphological case. I argue that the most important of these is the syntactic notion. However, syntactic case has to be regarded as a property of the phrase, not of individual words (or word forms). Word forms reflect (realize, serve as an exponent of) syntactic case in various ways to various extents depending on the language. I code this by proposing a realizational account of syntactic case specification and of the relation between the syntactic case of a noun phrase (determiner phrase) and the morphological case marking on constituents of that noun phrase. A consequence of this for LFG is that syntactic case (the attribute that is represented in f-structure) is not projected from inflected words. This means that there is no need, in German at least, for us to assume that a case-marked word form constructs a grammatical function by means of an inside-out designator (as proposed by Nordlinger, 1998, for Australian case systems). On my account a structural syntactic cases is best conceived of as a signal or exponent of a grammatical relation. For instance, suppose that a c-structure NP node is given the annotation (↑POSS)=↓, specifying that NP as the exponent of a possessor. Then the syntactic case associated with that NP is defined by means of a conditional: (↑POSS)=↓ ⇒ (↓CASE)=GEN. More generally, we need to be able to map parts of complete f-structures to c-structures. For instance, to define an ergative SUBJ we need a statement along the following lines: Where f is a complete, coherent clausal f-structure containing SUBJ and OBJ attributes, then the c-structure correspondent of SUBJ is annotated (↓CASE) = ERG.

In effect, the proposal reverses the 'direction' of constructive case. Where a constructive designator acts as an instruction to add a GF description to an f-structure, the realizational equivalent takes a GF in an f-structure and annotates the c-structure correspondent with the case feature that realizes that GF. In principle, the two types of relation should be inverses of each other, but this isn't entirely the case, because under the present proposal the relationship between case marking of a phrase and morphological case marking is non-standard. I leave it for future research to determine the extent to which the realizational approach is compatible with a constructive case interpretation, and if so, under what terms.

The realizational rules are not yet formulated explicitly in the paper. They are most naturally envisaged as an extension of the Paradigm Function architecture familiar from morphology (Stump 2001), in which the realization rules serve to define the manner in which an f-structure (and perhaps associated semantic features) is realized in c-structure and morphological form. Some of the realization rules select individual function words, for instance:

(1) [SPEC DEF] ⇒ [$_{D}$ *the*]

Others define constructional idioms (periphrases), for instance,

(2) [ASP PERF] ⇒ HAVE + V[PastPart]

(Specific examples of this kind of construction are discussed in Spencer 2001, 2003).

Case rules define (structural) syntactic case marking, e.g. for structural case in ergative languages, apply the following rules (where either rule can be pre-empted by a more specific rule, e.g. one defining Experiencer SUBJ as DAT, or volitional intransitive SUBJ as ERG):

(3) (i) where ν is the c-structure correspondent of SUBJ in the f-structure

PRED ' Verb '

f : SUBJ

OBJ

annotate ν with (↓CASE) = ERG

(ii) where ν is the c-structure correspondent of GF in f, annotate ν with (↓CASE) = ABS.

2. Preliminary distinctions

As in earlier work (see Sadler & Spencer, 2001) I will refer to the names of syntactic properties/features (whether in f-structure, c-structure, a-structure or other projections) as "s-features" (without any commitment to a specifically featural analysis of these properties in a formalized grammar). Such labels are to be distinguished from purely morphological (form) properties governing the shapes of words, "m-features". In some instances there will be no morphological correlate to an s-feature (4a), and in other instances there will be no syntactic correlate to an m-feature (4b). In many cases, however, there will be some kind of correspondence, in that certain morphological forms will serve as the realization or exponent of an s-feature (or ensemble of s-features), (4c, d):

(4)	(a)	SUBJ	–	no m-feature equivalent
	(b)	[Declension:3rd]	–	no s-feature equivalent
	(c)	NUM PL	⇔	[Num:Pl] (usually!)
	(d)	CASE ERG	⇔	[Case:Erg] (but not always!)

3. Some LFG approaches to case

In this subsection I briefly outline two of a number of approaches to case in the LFG literature, which are pertinent to my argument.

3.1 Case as a constraint on form

King (1995: 177) provides the entry in (5) for the accusative singular form of the feminine gender noun KNIGA in Russian:

(5) *knigu* (↑GEN) = FEM
(↑NUM) = SNG
(↑CASE) =c ACC

She observes: "*Knigu* itself is not an accusative case noun, rather it is a form that must be assigned accusative case." In terms of the distinctions introduced in section 2 we can interpret this as follows:

> "*Knigu* itself does not bear the (syntactic) feature CASE ACC, rather it is a form bearing the morphological (form) feature [Case: Acc], which by default will have a c-structure correspondent bearing the attribute CASE ACC."

3.2 Constructive case

Nordlinger (1998) makes the important point that structural cases enjoy a very specific relationship with grammatical functions. She argues that case markers 'construct' grammatical relations, coded by means of inside-out designators, which allow reference to higher portions of f-structure. Thus, an ergative case morpheme might be given the entry shown in (6):

(6) ((SUBJ↑) OBJ)
(↑CASE) = ERG

This can be interpreted as saying 'my f-structure is the value of a SUBJ attribute, which is contained in an f-structure which contains an OBJ attribute'. This device offers an immediate way to capture the morphosyntactic function of structural case marking and therefore represents an significant advance over earlier approaches to similar phenomena.

3.3 Observations

Without investigating the extent to which the older approach exemplified by King (1995) is compatible with the newer Constructive Case model, I shall make brief observations on each of these approaches.

First, the Russian case system provides well-known problems for the kind of entries deployed by King. Russian nominals inflect for a number of cases, including nominative, accusative and genitive. The accusative plural of all animate nouns is identical to the genitive, while the accusative plural of all inanimate nouns is identical to the nominative. Modifiers inflect in the same way as head nouns, so that choice of ending for accusative plural depends on the animacy of that head noun. Feminine gender nouns belong either to the 2nd or 3rd declension. In either case the accusative is distinct from the genitive in the singular (and 2nd declension nouns have the unique form in *–u* illustrated in (5)). Most masculine gender nouns are in the 1st declension. In the singular these show the same syncretism as plural nouns: the accusative singular of animates is identical to the genitive and that of inanimates is identical to the nominative. Modifiers reflect animacy in the accusative in that they take the genitive singular form when agreeing with an animate masculine noun in accusative contexts and they take the nominative singular form with inanimates in the same contexts.

There is an interesting twist, however. Many masculine animates follow the 2nd declension, including many proper name diminutives such as Sasha, Lyosha, Volodya and even the word *mužčina* 'man'. Being 2nd declension nouns these have the dedicated accusative singular form in *–u*. The behaviour of such nouns is illustrated in the examples in (7), contrasting with 1st declension masculines and 2nd declension feminines:

(7) Ja uvidel
‘I saw

a.	vysok-uju	ženščin-u
	tall-FEM.ACC.SG	woman.FEM-ACC.SG
	‘a tall woman’	
b.	vysok-uju	rjabin-u
	tall-FEM.ACC.SG	rowan.fem-ACC.SG
	‘a tall rowan tree’	
c.	vysok-ogo	mal’čik-a
	tall-MASC.GEN.SG	boy.masc-GEN.SG
	‘a tall boy’	
d.	vysok-ij	dub
	tall-MASC.NOM.SG	oak.MASC-NOM.SG
	‘a tall oak tree’	
e.	*vysok-ij	mal´čik
	tall-MASC.NOM.SG	boy.masc-NOM.SG
f.	vysok-ogo	mužščin-u
	tall-MASC.GEN.SG	man.MASC-ACC.SG
	‘a tall man’	

cf:

g.	vysok-ogo	mužščin-y
	tall-MASC.GEN.SG	man.MASC-GEN.SG
	‘a tall man’	
h.	*vysok-ij	mužščin-a
	tall-MASC.NOM.SG	man.MASC-NOM.SG
	‘a tall man’	

The problem presented by these data is to ensure that an accusative DP with a masculine animate lexical head triggers genitive agreements, even when the noun itself has a dedicated accusative form, as in (7f) vs. (7g). Thus, in (7f) we have to ensure that the inflected form *mužčinu* has a lexical entry specifying that it is accusative, but the adjective has to be given a conflicting case value, genitive. The problem for constructive case is to ensure that a genitive case form is able to construct the grammatical function appropriate to accusative case (direct object, complement to certain prepositions) in addition to the genitive case form functions (possessor, complement to certain classes of verbs and prepositions).

There are other interesting problems for the Constructive approach to case. These are summarized in (8):

(8) Issues for Constructive Case

- It requires coherent lexical entries to case markers.
- Case marking has to perform a dual function: CASEs construct GF's (of which they are an attribute) but also have to constrain morphological form of lexical head.
- 'Agreement': how do you force, say, CASE ERG on more than one constituent of a SUBJECT NP (cf Sells, forthcoming)? More particularly, how can one account for:
- 'Excrescent case marking' (Nordlinger 1998 on Warlpiri)

(9) Jalangu-rlu ka-lu-jana puluku turnu-ma-ni
today-ERG PRES-3.PL.S-3.PL.O bullock(ABS) muster-CAUS
yapa-ngku
man-ERG
'The people are mustering cattle today'

In (9) (Nordlinger's example (50)), the adverbial *jalangurlu* 'today' is marked with ergative case because that is the case of the subject. Thus, Nordlinger writes the equation given in (10):

(10) ((GF↑) SUBJ CASE) = ERG

This says that the f-structure of whole clause, (GF↑), has a SUBJ attribute whose CASE attribute has the value 'ERG'. However, the ADJUNCT *jalangu-rlu* is not itself marked CASE ERG in f-structure. But in that case, it's not obvious why the f-structure SUBJ attribute has to have a value for a CASE feature, since the CASE has done its job (twice!) of constructing the SUBJ.

4. The German Genitive

In this section I show that the genitive m-case markers of Standard German (Hochdeutsch) cannot be given coherent lexical entries. Morphological genitive case marking on a noun is sometimes excluded in contexts where the syntax demands CASE GEN contexts and in other contexts it is neither necessary nor sufficient.

4.1 Case-marking is not necessary: non-obligatory marking

Masculine gender proper names inflect for genitive. However, in compound names (for instance, given name + surname) only the final element inflects for genitive (11). Some prepositions select genitive case complements, but proper names never inflect for genitive after these prepositions (12). Finally, if a propername is modified by an inflecting determiner or adjective then the head noun cannot inflect for genitive (13):

(11) a. die Kantaten Johann Sebastian Bachs
'the cantatas of J S Bach'

b. die Kantaten Johanns

(12) statt Bach(*s)
'instead of Bach'

(13) die Konzerte des jüngsten Bach(*s)
'the concertos of the youngest Bach'

The last fact crucially refers to the property 'Proper Name'. Some proper names are homophones with common nouns, and this can give rise to minimal pairs such as that shown in (14). Only the inanimate dirigible is allowed to inflect in the genitive (14b), not the founder of the company that made the airships (14a):

(14) a. das Schicksal des weltbekannten Zeppelin
the fate THE.GEN famous Zeppelin
'the fate of the famous (Count) Zeppelin'

b. das Schicksal des weltbekannten Zeppelin-s
the fate THE.GEN famous Zeppelin-GEN
'the fate of the famous Zeppelin (airship)'

4.2 Case-marking not sufficient - obligatory overt marking

It has been observed (Schachtl 1989, Gallmann 1990, 1996, 1997) that there are other constraints on the patterning of case marking on nouns[1]. In the plural nouns lack an unambiguous genitive form. Bare noun complements in genitive case contexts are unacceptable (15a) and require a case marked modifier of some sort (15b):

(15) a. *die Aussagen Zeugen
'the statements of witnesses.PL'

b. [OK]die Aussagen dieser Zeugen
'the statements of this.GEN.PL witnesses.PL'
'the statements of these witnesses'

This may seem functionally motivated, but it's of interest that the determiner *dieser* 'this' could be masculine singular nominative or feminine singular genitive/dative. Thus, the form itself only determines the features 'genitive' and 'plural' in conjunction with the head noun. Moreover, no such modification is required in nominative or accusative case contexts.

Of particular interest for the theory of lexical entries and case marking is the fact that even an unambiguously genitive case-marked noun form isn't always sufficient to guarantee acceptability:

(16) a. *Er bedarf Zuspruch-es
'He needs consolation-GEN.SG'

b. [OK]Er bedarf unser-es Zuspruch-es
'He needs our-GEN.SG consolation-GEN.SG'
'He needs our consolation'

In (16) the form *Zuspruches* is unambiguously genitive and singular but the form can't be used as a genitive complement in isolation. In (16b) the modifier is also unambiguously (masculine/neuter) genitive singular, but that is not true of the modifier in (17b) below:

[1] See also Zlatić & Wechsler (2001) on similar phenomena in Serbo-Croat

(17) a. die Verarbeitung des Holz-es
the preparation THE.MASC.GEN.SG wood-GEN
'the preparation of the wood'

b. die Verarbeitung tropisch-en Holzes
the preparation tropical-en wood-GEN
'the preparation of tropical wood'

The form *tropischen* could appear in almost any cell of the paradigm, depending on whether there is a definite determiner somewhere in the DP, and thus it can't by any stretch of the imagination be said to uniquely determine the (already uniquely determined) head noun. On the other hand, there has to be some modifier and that modifier has to inflect. In (18) we see that an indeclinable modifier, *prima* 'fine', is as bad as no modifier at all:

(18) *die Verarbeitung (prima) Holz-es
the preparation fine.INDECL wood-GEN

To complicate matters somewhat, an indeclinable modifier such as *rosa* 'pink' is acceptable provided it is accompanied by a declinable modifier (19a), but the declinable modifier must precede the indeclinable (19b):

(19) a. Das Tragen gestreift-er, rosa Kravatte-n
the wearing striped-PL.GEN pink tie-PL
'the wearing of striped, pink ties'

b. *Das Tragen rosa gestreift-er Kravatte-n
the wearing pink striped-PL.GEN tie-PL

4.3 Conclusions

The German facts just summarized show us that it is not sufficient to furnish the lexical entry for nouns of the form *Noun*–(*e*)*s* with a constraint equation (↑CASE) $=_c$ GEN in the manner of (5). This:

- gives ungrammaticality with (some) Proper Nouns
- is not sufficient on Nouns generally in possessive constructions and complements to nouns

These data also show that a noun form with unambiguous morphological case marking isn't always capable of constructing a grammatical function (such as 'POSS', 'OBJ'). I will therefore propose a different account of case marking which is capable of capturing the full richness of the phenomenon, and which can also answer the questions posed in section 3.3.

5. Realization-based analysis

In this section I present an analysis that relies on the idea of capturing regularities in morphosyntax by reference to mapping principles which take partial f-structures and specify the kinds of c-structures that can realize those f-structures. I have argued for such a 'top-down' approach to auxiliary-participle constructions in Slavic (Spencer 2001, 2003), following the lead of Ackerman & Webelhuth (1998). In this section I develop these ideas in the context of the German genitive. The analysis has also been significantly influenced by the work of Durrell (1979).

5.1 Overview

The basic assumptions of the analysis are presented in (20):

(20) Basic assumptions

- Distinguish specification/distribution of CASE in the syntax from the morphological realization of case (s-CASE vs. m-Case).
- CASE is a grammaticalized property, hence, it must be apparent in grammatical structures (e.g. CASE agreement, CASE selection by specific lexical items etc.). Thus, we aren't committed to saying that the English preposition *with* is a 'Instrumental Case (marker)'.
- CASE is a device for (partially) realizing GFs, specifying semantic aspects of GFs (including adjuncts), specifying semantic aspects of predicators (verb, adposition, ...)
- CASE is a property of NPs (DPs), not of nouns, not even Case-marked nouns.
- CASE is realized (partly) by morphosyntactic marking on the NP/DP: (i) lexical head marking, (ii) phrasal affixation (cliticization) to (some constituent of) NP

The proposal is summarized in (21):

(21) Proposal

- The distribution of s-CASE is determined by f-structure properties (together, possibly, with aspects of semantics, information structure, ...). These define 'CASE contexts'.
- CASE assignment is defined by the f-structure $\Leftrightarrow$ c-structure mapping (but it may also appeal to other projections).
- CASE is (partially) realized by morphological Case (m-Case).
- The syntax $\Rightarrow$ morphology mapping is couched in terms of 'realization rules' governed by default inheritance[2]. This allows us to capture the idea of a default realization or a default mapping.

5.2 Illustration: Syntax $\Rightarrow$ morphology mapping

5.2.1 Syntactic case contexts (informal statements)

In (22) I define informally the kinds of contexts which demand genitive case marking in German:

(22) a. $(\uparrow \text{POSS}) = \downarrow$ (Possessor NP)
b. $(\uparrow \text{OBJ CASE}) =_c \text{GEN}$ (Gen complements to V, P)

The default mapping principle for the POSS GF is shown in (23):

(23) $(\uparrow \text{POSS}) = \downarrow \Rightarrow (\downarrow \text{CASE}) = \text{GEN}$
a possessor NP is marked GEN (ceteris paribus!)

In addition, we will need parochial lexical annotations for genitive-taking verbs and prepositions: $(\uparrow \text{OBJ CASE}) = \text{GEN}$[3]. A theory of deverbal nominalizations will also

[2] A generation-mode OT analysis may well be a feasible way of implementing this.

[3] I haven't been able to determine how best to state such constraints. It's very important for my approach that a satisfactory way be found of integrating such

be needed so as to express the fact that an argument of the original verb can be expressed as though it were the complement of the (derived) noun.

Simplifying, then, the equation in (23) tells us that, other things being equal, a c-structure constituent which maps to a POSS GF has to have a genitive case value. I shall assume that such case values are freely assigned to maximal nominal projections as part of the phrase structure component. Equations of this sort will link c-structure CASE annotated NP/DPs with the f-structure correspondents[4]. Now we must turn to the mapping between c-structure and morphological form.

5.2.2 Morphosyntactic realization (for German)

The morphological-case system for German in general distinguishes four cases in each of the singular and plural numbers. In addition, the agreement system recognizes three genders. Adjectives inflect in two ways, showing the so-called 'weak inflection' in the domain of definite determiners, and the so-called 'strong inflection' in most other cases (there is also a 'mixed inflection'). I shall not discuss adjectival inflection in this paper. As far as I can tell the 'strong/weak' declension property is essentially orthogonal to the specific claims being advanced here about case assignment.

The full inflectional system is only found with determiners. The situation with lexical nouns is complicated somewhat by the fact nouns come in two declension classes, 'strong' and 'weak'[5]. The 'weak' nouns take the *–(e)n* desinence in all case/number forms except nominative singular. The 'strong' nouns have a richer, but still severely depleted case system., schematized in (24):

(24) a. {nominative, accusative, genitive} plural
b. {accusative, dative} singular
c. dative plural
d. genitive singular
e. nominative singular

The patterns are illustrated in (25):

(25) Noun declension:

a. [Class: Strong]

Form:

Base	*Mann*	*Zeuge*	*Bach*
PluralForm	*Männer*	*Zeugen*	*Bachs*
GenForm	*Mannes*	*Zeuges*	*Bachs*
DatForm	*Männern*	*Zeugen*	*Bachs*

b. [Class: Weak]

Form:

Base	*Student*
EnForm	*Studenten*

---

exceptional case marking instances into the architecture. See also the remarks below on non-default subject case marking.

[4] If we were to make (23) into a biconditional we would effectively be formalizing a version of Constructive Case.

[5] This distinction is not to be confused with the 'strong/weak' adjective declension classes.

As can be seen a number of distinctions are completely neutralized. The situation as a whole can be summarized as follows:

- No noun distinguishes non-dative case in the plural
- No noun distinguishes accusative/dative case in the singular
- Weak nouns have *–en* as their default form

If we ignore the Weak nouns, we find that a noun's inflectional paradigm includes at most a base form, a genitive singular, a dative plural and a non-dative plural form. This means that we need just the feature set in (26) to account for noun inflection (cf the observations in Gallmann 1998, 2003, Müller 2002):

(26) a. [Class:{Strong, Weak}], [Type:{Proper, Common}]
b. [Form:{Base, PlForm, GenForm, DatForm}]

We must now make explicit various aspects of case marking and the syntax-to-morphology mapping for case.

(27) For Determiners and (strong) adjectives only:

CASE NOM ⇒ Case: Nom
CASE ACC ⇒ Case: Acc
CASE GEN ⇒ Case: Gen
CASE DAT ⇒ Case: Dat

The following syntax ⇒ morphology default mappings apply:

(28) a. CASE is realized on phrase-initial Det/(strong) Adj
b. CASE is realized on lexical head (but not by (27))

In order to account for the complex and somewhat irregular patterning of case marking which we've seen we need a number of stipulative principles:

(29) Stipulations:

- Weak/mixed declension of adjectives is required after strong determiners.
- Proper nouns inflect on the rightmost word only.
- In POSS/OBJ NPs marked CASE GEN, the leftmost c-structure correspondent in the Det/Adj field must be marked [Form:GenForm], hence:
  **die Verarbeitung (prima) Holzes*
  *bedarf *(dieses/unseres) Zuspruches*
- A proper noun is realized by [Form:Base] in the following contexts:
  (i) where Det/Adj field is not empty: *die Konzerte des jüngsten Bach(*s)*.
  (ii) after *statt*-class prepositions: *statt Bach(*s)*
- Various other stipulations: *des Barock* 'of the baroque (period)', *in den letzten Tagen des Monats Oktober* 'in the last days of the month of October' vs. *in den ersten Tagen des Oktobers* 'in the first days of October', etc.

As a result the syntax proper is relatively simple, and the idiosyncrasies are limited to the syntax ⇒ morphology mapping and to the enumeration of morphological forms.

6. Some questions for future research

A phenomenon which has been much discussed and which requires some explication in the framework presented here is that of non-default case assignment to grammatical functions, and particularly the assignment of non-default ('quirky') cases to subjects

in languages such as Icelandic. Andrews (1982, 1990) has developed a detailed account of this within LFG which relies on the idea of a grammatical function taking case attributes in f-structure. In addition, the grammatical function itself is the value of a case attribute. Clearly, that approach is incompatible with the approach adopted here, in which (syntactic) case features are attributes solely of c-structure maximal projections and are illegitimate as f-structure attributes.

On the present approach, non-default assignment generally is handled by overrides. Thus, the class of verbs which select dative, genitive or accusative subjects would be marked in such a way as to require any subjects with overt c-structure correspondents to bear the appropriate lexical case. This would capture the intuition (expressed explicitly in the approach of Andrews, for instance) that nominative is in some sense the default, unmarked case. In this respect, the existence of quirky case marking offers a certain degree of motivation for the realizational approach, because the default nature of nominative marking follows automatically from the architecture. However, there are several issues in Icelandic morphosyntax which the realizational approach doesn't yet address, such as the case marking of null subjects in complements and other questions. These must be left to future research.

I have assumed (somewhat tacitly) that case annotations are freely assigned to NP/DP nodes and that illicit assignments are excluded because of violation of a constraint equation. However, this doesn't capture the behaviour of structural cases as described by Maling (1993) for Finnish or by Wechsler & Lee (1996) for Korean. In those languages (as in certain Slavic languages) certain (mainly temporal) adverbials a marked with accusative. In contexts such as the passive, such accusative-marked adverbials may assume nominative case, indicating that they are structurally marked. (In Russian an accusative-marked adverbial may receive the genitive-of-negation in negation contexts.) One way of addressing this question would be to examine the extent to which the proposals of this paper are compatible with or can incorporate the notion of a case 'tier' proposed by Yip, Maling and Jackendoff (1987). For instance, it might be possible re-conceptualize their case tier as a positive restriction in the sense of Andrews and Manning (1999). We would then assume, following Yip et al., that there is a fixed sequence of available cases and that the linkage between the case tier and c-structural is defined by the realizational mapping principles introduced earlier. However, other technical responses to this problem spring to mind and so I shall leave this aspect of the problem to future research.

In a variety of languages we find that case marking of a GF depends on semantic factors. Thus, in Hindi-Urdu a subject may be marked with the 'ergative' marker *ne* if it is necessary to stress the agentive properties of the subject (for instance, to distinguish between volitional and involuntary actions, Butt 1995). Likewise, in Finnish choice of genitive/accusative vs. partitive case for the direct object depends on whether the object is affected entirely or only partly (Maling 1993). These and many other related phenomena demonstrate that the case specifying mapping principles sometimes need access to a properly semantic representation, as well as to f-structures.

On occasions a particular grammatical function such as OBJ or POSS can be realized in entirely different ways depending on various factors. One obvious instance of this is found in languages with free noun incorporation, in which a direct object (and sometimes other GFs) can either be expressed as a NP/DP in the syntax or as part of a compound verb stem (with intermediate possibilities). Conversely, we sometimes find an alternation between NP-internal expression of possessors and external marking of possession. My assumption is that in such constructions one of the

structures will be the default and the others will be conditioned by discourse, semantic, morphosyntactic or lexical properties. However, there is no obvious problem in principle with such cases. Indeed, they merely illustrate again the fact that the mapping which specifies how a given GF is to be expressed morphosyntactically in the general case needs to take as its input a rich representation, including not only f-structure attributes, but also other aspects of the representation such as semantics.

Finally, a problem which has been largely ignored in this paper is that of multiple case marking. There are two distinct, though possibly related, questions here. The first is how to handle the familiar phenomenon of so-called 'case agreement', in which a modifier reflects the case marking of the head that it modifies. It is unclear whether such phenomena belong properly to a theory of syntactic 'multiple exponence' or to a theory of agreement. Another problem is that of successive marking of more than one case on a single nominal, as found in many Australian languages (Nordlinger 1998). Languages can exhibit very complex patterning here (for an overview see the papers in Plank 1995). A treatment within the current framework would presuppose a properly worked out theory of case agreement generally, and that will have to await a special study.

7. Conclusions

I present here the principal implications of this paper for the architecture of grammatical theory.

- m-Case is a paradigmatic (inflectional) property of a noun lexeme serving various purposes, including the expression of s-CASE.
- s-CASE is an (abstract) property of maximal constituents (typically the NP/DP).
- s-CASE can be realized as m-Case (and other structures) by means of realization rules which define the mapping s-CASE $\Rightarrow$ m-Case.
- The relationship between s-CASE and m-Case is in general many-many (as witnessed by mismatches between s-CASE labels and m-Case labels). Hence, the realization of CASE need not be 'compositional'
- The specification of CASE in c-structure is the result of mapping rules (realization rules) which take partial f-structure as input. They may also take other aspect of the representation into account, such as discourse factors or semantics.
- The specification of s-CASE is achieved by default mappings which can be overridden in specific circumstances.

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