

Comparing rule-based and constraint-based analyses of differential object marking

Udo Klein

Workshop: Differential Case Marking
Stuttgart, 1st November 2007

Contents

1	Introduction	2
2	Data	3
2.1	Uzbek	3
2.2	Hindi	4
2.3	Preliminary conclusion	5
3	A rule-based analysis of differential object marking	6
3.1	Basic idea	6
3.2	Romanian	7
3.3	Uzbek	9
3.4	Accounting for cross-linguistic generalizations	10
4	A constraint-based analysis of differential object marking	11
4.1	Aissen's OT analysis	11
5	Comparison	13
5.1	The complex and language-specific interaction of factors	13
5.2	Optionality	14
5.3	Prominence hierarchies	14
5.4	Diachronic change	14
5.5	Explaining cross-linguistic generalizations	15
5.6	Separating language knowledge and language use	16
5.7	The question of psychological reality	17
6	Conclusion	18

1 Introduction

In our project we have been working on differential object marking (and case alternations generally) in the following languages:

- Mongolian, Uzbek
- Romanian, Spanish
- Russian
- Hindi

In previous work (see e.g. von Stechow and Kaiser (2005, 2007)), it has been suggested that in Spanish the development of differential object marking depends not only on the properties of the direct object, but also on the properties of the verb, in particular on the s-selectional restrictions of the verb: while by the 14th century 60% of definite direct objects of verbs like *matar* (kill), *herir* (hurt) are differentially object marked, it is only in the 17th century that the same rate of human/animate definite objects of verbs like *ver* (to see) are marked.

In this talk we focus on synchronic data from Uzbek and Hindi which suggest that differential object marking may depend on semantic properties of transitive verbs and not just on the semantic properties of the object. Our working hypothesis is that in addition to the referential and animacy properties represented by the hierarchies in (1) and (2), DOM in these two languages also depends on whether or not the entity denoted by the object changes as a result of the process denoted by the verb.

- (1) Pro. \succ Name \succ Def./Dem. \succ Indef.spec. \succ Indef.nonspec. \succ Non-arg.
- (2) Hum. \succ Anim. \succ Inanim.

In this paper we:

- present data which suggests that DOM depends on the complex interaction between the semantic properties of both argument and predicate
- present a rule-based analysis of DOM which is flexible enough to characterise these form-meaning correlations
- compare this rule-based account with the OT account presented in Aissen (2003)

2 Data

2.1 Uzbek

Direct objects expressed by pronouns, names and definite/demonstrative NPs must be suffixed with the ACC marker *ni*, irrespective of the animacy of the object.

Direct objects expressed by indefinite NPs referring to animate entities must be suffixed with *ni*.

- (3) a. U kech'a bir/bitta hotin*(-ni) ku'r-ib-di.
3SG yesterday a woman-ACC see-PTCP-3SG
He saw a woman yesterday.
- b. Sen bitta muschuk*(-ni) urvor-ding-mi?
2SG a cat-ACC run.over-2SG-Q
Did you run over a cat?

Direct objects expressed by indefinite NPs referring to inanimate entities may or may not be ACC marked, depending on the type of verb. Certain verbs (verb type V1), among them *tuzatmoq* (repair.INF), *bu'yamoq* (paint.INF), *u'chirmoq'* (to erase), *buzmoq'* (to destroy), *ishirmoq'* (to pump) require the indefinite direct object to be ACC-marked, irrespective of the specificity of the argument.

- (4) a. Men bitta stol*(-ni) tuzat-dim.
1SG a table-ACC repair-1SG.PRF
I've repaired a table.
- b. Men ertaga eng kam-i-da bitta stol*(-ni)
1SG tomorrow at least-POSS-DAT one-CLASS table-ACC
tuzat-a-man.
repair-FUT-1SG
Tomorrow I will repair at least one table.
- (5) Men ikki-ta emas, balki uch'-ta eschik*(-ni)
I two-CLASS NEG, but three-CLASS door-ACC
bu'ya-dim.
paint-ACC
I've painted three doors and not two.

Verbs of a second type (verb type V2) allow ACC marking of indefinite direct object referring to inanimates.

- (6) U bitta kitob(-ni) u'q'i-di.
 3SG a.CLASS book-ACC read-3SG
 S/he read a book.
- (7) Farhod men-ga bitta rasm(-ni) ku'rsat-di.
 Farhod 1SG-DAT a.CLASS picture show-3.SG.PRF
 My younger sister showed me a picture.

Verbs of the third type (verb type V3, e.g. *sotib olmoq*' to buy, *emoq*' to eat, *pischirmoq*' to cook, *yoymoq*' to write) require indefinite direct objects referring to inanimates to be unmarked for case.

- (8) Men bitta moschina(*-ni) sot-ib ol-dim.
 I a car-ACC buy-PTCP take-1SG.PRF
 I have bought a car.
- (9) Farhod kecha bitta hat(*-ni) yoz-di
 Farhod yesterday a.CLASS letter-ACC write-3SG.PRF
 Farhod wrote a letter yesterday.

Provisional version of conditions for differential object marking in Uzbek:

DOM	Pro	Name	Def./Dem.	Indef	Incorp.
hum				+	
anim				+	
inanim	V1		+	+	-
	V2			±	
	V3:			-	

where

- V1 = {repair, paint, erase, break/destroy, pump, ... },
- V2 = {see, show, read, ... }
- V3 = {buy, eat, cook, write, ... }

2.2 Hindi

Mohanan (1994, p. 81) claims that verbs which require inanimate objects cannot be ACC-marked:

- (10) a. ilaa-ne yah k^hat lik^haa.
 Ila-ERG this.NOM letter write.PERF
 Ila wrote this letter.

- b. * ilaa-ne is k^hat-ko lik^haa.
 Ila-ERG this.NN letter-ACC write.PERF
 Ila wrote this letter.

However, we found that:

- (11) Mera dost is gana-ko gata hai.
 my friend this.NN song-ACC singen be.Pres
 My friend sings this song.
- (12) a. Mai-ne yah chitthi likhi.
 I-ERG this.NOM letter write.PRF
 I wrote this letter.
- b. Mai-ne is chitthi-ko likha.
 I-ERG this letter-ACC write.PRF
 I wrote this letter.

In addition, we found that inanimate indefinite objects of some verbs can be marked with *ko* (13), whereas inanimate indefinite direct objects of other verbs cannot be ACC-marked (14, quoted from Aissen (2003, 464)).

- (13) Adnan-ne ek phool kudi-ko toda.
 Adnan-ERG a flower vase-ACC break.PRF
 Adnan broke a vase.
- (14) * Larke-ne aaj subah ek p^huul-ko dek^haa.
 boy-ERG today morning one flower-ACC see.PRF
 The boy saw a flower this morning.

2.3 Preliminary conclusion

Both in Uzbek and in Hindi there seems to be evidence that differential object marking depends on a complex interaction between the properties of the argument and the properties of the verb. In some other languages DOM may even depend on the properties of the subject, e.g. in Chepang (see DeLancey (1981) and Næss (2006)).

These complex relations between a variety of semantic properties and their morpho-syntactic encoding motivate the choice of a formalism which allows for an explicit and flexible characterization of the relation between form and meaning. Moreover, since it is not entirely clear which properties of DOM should follow directly from the formalism, we chose a formalism which is neutral with respect to this.

3 A rule-based analysis of differential object marking

3.1 Basic idea

A grammar consists of conventionalised correlations between formal and semantic structure.

Conventionalised correlations between formal and semantic structure are expressed by means of rules (also called modes of combination), which combine a number of component signs (i.e. form-meaning pairs) into a resulting composite sign.

Rules operate simultaneously on the formal and semantic parts of the component signs.

Given a sign s this framework (see Kracht (2003, 2007) for details) is designed such that: (i) the meaning of s is determined by the meanings of the component signs, and the mode of combination (compositionality), and (ii) the expression of s is determined by the expressions of the component signs and the mode of combination used (inverse of compositionality).

A set of rules is a grammar of a language iff the rules generate all and only the signs of this language given a set of atomic signs.

Both rules and categories are language-specific.

Claim: Languages with differential object marking have two rules for combining direct objects and verbs.

The first rule applies if the nominal (i) is overtly marked for case, and (ii) has certain semantic properties C_1 . The second rule applies if the nominal (i) is not overtly marked for case, and (ii) has certain semantic properties C_2 .

If a certain type of direct object can only be combined with the verb by means of the first rule (due to its semantic properties), then this type of direct object is obligatorily overtly marked. If a certain type of direct object can only be combined with the verb by means of the second rule, then this type of direct object is obligatorily unmarked for case. If a type of direct object can be combined by means of both rules (if the semantic properties of the direct object are compatible with both C_1 and C_2), then this type of direct object can (but need not) be overtly marked for case.

We start with DOM in Romanian, as it illustrates the two rules when DOM is determined by the interaction of two nominal properties. Then we sketch the rules for Uzbek, where DOM depends on the interaction between the properties of both argument and predicate.

3.2 Romanian

Simplified conditions for DOM in Romanian (‘+’ means that the argument is overtly marked with **pe**, ‘-’ means that the argument is not overtly marked for case, and ‘N/A’ means that the rule is not applicable).

	Pro.	Name	Def.	Indef. spec.	Indef. non-spec.
animate	+	+	±	±	-
inanimate	-	-	-	-	-

This table shows that DOM in Romanian can be characterised by two correlations between form and meaning: (i) an argument is overtly marked with **pe** if it is animate and its type of reference is “indefinite non-specific” or higher on the referentiality scale, and (ii) an argument is unmarked for case if it is inanimate or if it is definite or lower on the referentiality scale. These two correlations will be captured by two rules for combining nominal signs with verbal signs.

The first rule R_1 applies to nominal signs which are animate and which are indefinite specific or higher on the referentiality scale. This rule requires the nominal sign to be overtly marked with **pe**. These conditions of application are illustrated below:

R_1	Pro.	Name	Def.	Indef. spec.	Indef. non-spec.
animate	+	+	+	+	N/A
inanimate	N/A	N/A	N/A	N/A	N/A

The second direct object rule R_2 applies to nominal signs which are either inanimate or indefinite non-specific. This rule requires the nominal sign to be unmarked for case. These conditions are illustrated below:

R_2	Pro.	Name	Def.	Indef. spec.	Indef. non-spec.
animate	N/A	N/A	-	-	-
inanimate	-	-	-	-	-

Note that both rules can apply to definite and indefinite specific arguments referring to animate entities (but only one of the rules can apply to the other types of arguments). This accounts for the optional marking of these two

types of arguments.

Claim: Discourse referents (DRs) have varying degrees of identifiability (cf. the notion of ‘dynamic referential stability’ in Farkas and von Heusinger (2003)):

- DRs identifiable only by means of contextual information have the highest degree of identifiability (ident:5). These DRs are (usually) expressed by personal pronouns.
- DRs identifiable by means of proper names have second highest degree of identifiability (ident:4). These DRs are expressed by proper names.
- DRs identifiable by both speaker and hearer by means of a property (other than a name) have third highest degree of identifiability (ident:3). These DRs are expressed by definite NPs.
- DRs identifiable only by the speaker, agent or other person have fourth highest degree of identifiability (ident:2). These DRs are expressed by indefinite NPs.
- DRs which are not identifiable have fifth highest degree of identifiability (ident:1). These DRs are expressed by indefinite NPs or by means of incorporation.
- Non-referential NPs have the lowest degree of identifiability (ident:0)

Rule R_1 is:

$$R_1\left(\begin{bmatrix} \mathbf{e}_1 & : & [\text{cat:N, case:ACC}] \\ \mathbf{m}_1 & : & X \end{bmatrix}, \begin{bmatrix} \mathbf{e}_2 & : & [\text{cat:V}] \\ \mathbf{m}_2 & : & [\text{cat:PRED}] \end{bmatrix}\right) =$$

$$\begin{bmatrix} O_1^\epsilon(\mathbf{e}_1, \mathbf{e}_2) & : & [\text{cat:V}'] \\ O_1^\mu(\mathbf{m}_1, \mathbf{m}_2) & : & [\text{cat:PRED}] \end{bmatrix}$$

where (i) $X = [\text{cat: ARG, anim:+, ident:}\geq 2]$ and (ii) O_1^μ saturates the placeholder for the P argument of \mathbf{m}_2 with \mathbf{m}_1 .

Rule R_2 is:

$$R_2\left(\begin{bmatrix} \mathbf{e}_1 & : & [\text{cat:N, case:}\star] \\ \mathbf{m}_1 & : & X \end{bmatrix}, \begin{bmatrix} \mathbf{e}_2 & : & [\text{cat:V}] \\ \mathbf{m}_2 & : & [\text{cat:PRED}] \end{bmatrix}\right) =$$

$$\begin{bmatrix} O_1^\epsilon(\mathbf{e}_1, \mathbf{e}_2) & : & [\text{cat:V}'] \\ O_1^\mu(\mathbf{m}_1, \mathbf{m}_2) & : & [\text{cat:PRED}] \end{bmatrix}$$

where (i) $X = [\text{cat: ARG, anim:-}] \vee [\text{cat:ARG, anim:+, ident:\leq 3}]$, and (ii) O_1^u saturates the placeholder for the P argument of \mathbf{m}_2 with \mathbf{m}_1 .

3.3 Uzbek

Summary of conditions for differential object marking in Uzbek:

DOM	Pro	Name	Def./Dem.	Indef	Incorp.
hum				+	
anim				+	
inanim	V1		+	+	-
	V2			\pm	
	V3:			-	

Conditions of application for rule R_1 in Uzbek:

DOM	Pro	Name	Def./Dem.	Indef	Incorp.
hum					
anim					
inanim	V1	Case:ACC			N/A
	V2				
	V3:				

Conditions of application for rule R_2 in Uzbek:

DOM	Pro	Name	Def./Dem.	Indef	Incorp.
hum					
anim					
inanim	V1	N/A			Case:★
	V2				
	V3:				

Remember that the rules need to specify (i) what type of signs they combine (i.e. under which conditions they apply) and (ii) what the result of the formal and semantic operation is.

As a working hypothesis we assume that the class V1 contains (a subset of?) the verbs which entail that the object changes its state. Since it is not entirely clear what the distinguishing semantic property of the class V3 verbs is, I shall represent this property as P_3 .

The first rule then applies if:

- if the degree of identifiability of the argument is bigger than 2.
- if the degree of identifiability is 1 or 2 and the argument is animate
- if the degree of identifiability is 1 or 2, the argument is inanimate and the predicate does not have property P_3

The second rule applies if:

- if the degree of identifiability is 0.
- if the degree of identifiability is 1 or 2, the argument is inanimate and the predicate does not have property P_1 .

3.4 Accounting for cross-linguistic generalizations

Neither the grammar nor the grammar framework predicts the following cross-linguistic generalization:

- (G) **If a language overtly marks a P argument then it also marks all P arguments which are higher on the relevant prominence scale(s).**

This typological generalization can be explained if (in most cases):

1. Objects expressed by pronouns or objects referring to humans are overtly case-marked first.
2. Overt case-marking of objects spreads downward along the referentiality and/or animacy hierarchy.

So why should objects expressed by pronouns or objects referring to humans be overtly case-marked first?

Claim: this is due to the interaction of two extragrammatical principles:

P1 Distinguish first where it matters most.

P2 Resist overt marking of signs of the most frequent type.

The distinction between two arguments which have highest prominence matters most. Therefore, according to P1 arguments which are most prominent are distinguished (e.g. by overt dependent marking, overt head marking or word order) first. Subjects (in languages with accusative alignment) are

more frequent than objects. So according to P2 overt marking of subjects is resisted more than overt marking of objects. Therefore objects which have highest prominence are overtly marked first.

Why should overt case-marking spread down the prominence hierarchies?

Claim: Spreading results from the reanalysis of the conditions for the applications of the rules R_1 and R_2 . At different stages, the reanalysis may depend on different semantic properties, as argued in von Stechow and Kaiser (2005).

4 A constraint-based analysis of differential object marking

4.1 Aissen's OT analysis

Based on Aissen (2003)

Grammars consists of two components. The first component generates all possible candidates given certain features. The second component chooses the optimal candidate, that is the candidate which has the lowest violation cost.

The second component consists of universal violable constraints which are ranked language-specifically.

Step 1: Three prominence hierarchies are assumed:

- Subjects are more prominent than direct objects.
- Pronominal NPs are more prominent than NPs expressed by names, NPs expressed by names are more prominent than definite NP, etc..
- NPs referring to humans are more prominent than NPs referring to animals, NPs referring to animals are more prominent than NPs referring to inanimates.

Step 2: Subjects expressed by pronouns are more harmonic (represented by \succ) than subjects expressed by names, subjects expressed by names are more harmonic than subjects expressed by definite NPs, etc. Subjects referring to humans are more harmonic than subjects referring to animals, and subjects referring to animals are more harmonic than subjects referring to inanimates

(harmonic alignment).

$$S/pro \succ S/n \succ S/def \succ S/indef$$

$$S/hum \succ S/anim \succ S/inan$$

Step 3: Objects expressed by indefinite NPs are more harmonic objects than objects expressed by definite NPs, etc.. Objects referring to inanimates are more harmonic than objects referring to animals, etc. (harmonic alignment and markedness reversal).

$$O/indef \succ O/def \succ O/n \succ O/pro$$

$$O/inanim \succ O/anim \succ O/hum$$

Step 4: In OT these hierarchies are expressed by means of ranked constraints. The violation cost of less harmonic objects is higher (expressed by \gg) than the violation cost of more harmonic objects. So the violation of the constraint “Avoid objects expressed by pronouns” (represented by $*O/pro$) is worse than the violation of the constraint “Avoid objects expressed by names”.

$$*O/pro \gg *O/n \gg *O/def \gg *O/indef$$

$$*O/hum \gg *O/anim \gg *O/inan$$

Step 5: The less harmonic a direct object the more likely it is that it is overtly marked (principle of iconicity). This is expressed by conjoining (represented by $\&$) the previous constraints with a constraint which penalizes the absence of (i.e. requires) overt marking. This constraint is represented by $*\emptyset_C$. The violation cost of non-harmonic and morphologically unmarked direct objects is higher than the violation cost of harmonic and morphologically unmarked direct objects.

$$*O/pro \& *\emptyset_C \gg *O/n \& *\emptyset_C \gg *O/def \& *\emptyset_C \gg *O/indef \& *\emptyset_C$$

$$*O/hum \& *\emptyset_C \gg *O/anim \& *\emptyset_C \gg *O/inan \& *\emptyset_C$$

Step 6: On their own, these constraints penalize zero case marking, i.e. they prefer candidates with overt marking. This preference is opposed by

the principle of economy. This principle of economy is represented by the constraint “Avoid overt case marking”, represented by **STRUC_C*. If this constraint is ranked higher than e.g. **O/def & *∅_C*, then the violation of **STRUC_C* is worse than the violation of **O/def & *∅_C*, so the presence of overt marking on definite objects is worse than its absence, so (other things being equal) the candidate definite object without overt case marking is optimal.

5 Comparison

5.1 The complex and language-specific interaction of factors

In the rule-based analysis the rules and categories are language-specific, not universal.

OT, however, claims that the constraints are universal, and that differences between languages result from differences in ranking the universal constraints. But: the more constraints are claimed to be universal but inactive (low ranking) in most languages, the weaker the claim about their universality.

In the rule-based account the interaction of properties is characterised by specifying the conditions under which the respective rules apply. The same rule may apply under a number of different conditions. Each condition can in principle make reference to any combination of subject, object and verbal semantic properties.

In particular, instances of global case marking, which were argued by de Swart (2003) and de Hoop and Malchukov (2006) to be a problem for the analysis in Aissen (2003), are analysed by (global) rules which combine three signs at the same time: the subject, the object and the verb. (There is no restriction that rules may only combine two signs). The simultaneous combination of subject and object allows for the conditions on these rules to make reference to the properties of both arguments simultaneously, and thus to express e.g. that “in Awtuw the object is obligatorily marked with accusative case if the object is equally high or higher than the subject in the animacy hierarchy” (de Hoop and Malchukov, 2006, p. 6).

Aissen (2003, fn. 3): “I assume here that it is possible to distinguish DOM determined by the animacy/definiteness of the object from DOM determined

by aspect, and try to deal only with the former”. What if DOM depends on aspect or other semantic properties of the verb in addition to the two prominence scales? Would the structure of the constraints be three- or even four-dimensional?

5.2 Optionality

In the rule-based analysis optionality results from the possibility of combining particular direct objects with a verb by means of either rule.

In OT analyses, optionality results if the constraint **STRUC_C* has variable ranking with respect to a subset of constraints. Since some constraints must rerank whereas others must not rerank, OT can either stipulate which constraints must and which cannot rerank, or it must provide a theory of constraint reranking.

5.3 Prominence hierarchies

The rules in the rule-based analysis make reference to degrees of identifiability of a discourse referent, or to the animacy (human, animate, inanimate), but not to the hierarchies themselves. Knowing a particular language does not imply knowing the prominence hierarchies.

In Aissen’s OT analysis a subset of ranked constraints directly represent the prominence hierarchies. Does knowing the language imply knowing the hierarchies?

5.4 Diachronic change

We illustrate diachronic change in DOM by analysing the hypothesised spread of differential object marking from obligatory marking of pronouns only to obligatory marking of pronouns and names in Romanian.

In the first stage S1, only pronouns referring to animate entities are marked:

	Pro.	Name	Def.	Indef. spec.	Indef. non-spec.
animate	+	-	-	-	-
inanimate	-	-	-	-	-

This stage is analysed by postulating two rules R_1 and R_2 , where R_1 applies to pronouns referring to animates, and R_2 applies to all other arguments.

In the intermediate stage S2, the marking of animate pronouns is obliga-

tory, the marking of names is optional, and the other arguments cannot be marked:

	Pro.	Name	Def.	Indef. spec.	Indef. non-spec.
animate	+	±	-	-	-
inanimate	-	-	-	-	-

This transition from the first to the intermediate stage is analysed by postulating that the condition for the application of R_1 is reanalysed, resulting in a rule R'_1 which allows the combination of both pronouns and names referring to animates. The conditions for R_2 remain the same. This transition may be motivated by processing principle P1.

In the next stage S3 the overt marking is obligatory for both pronouns and names, while it is ungrammatical for the other arguments.

	Pro.	Name	Def.	Indef. spec.	Indef. non-spec.
animate	+	+	-	-	-
inanimate	-	-	-	-	-

The transition from S2 to S3 is analysed in two steps. First, speakers develop a preference for using R'_1 instead of R_2 in order to combine direct objects which are names referring to animates. Again, P1 may be involved in explaining why this is so. Second, this preference is grammaticalized in due course. As a result of this grammaticalization, the conditions for R_2 are reanalysed, resulting in the rule R'_2 which block the application of this rule to names referring to animates.

5.5 Explaining cross-linguistic generalizations

Typological generalizations characterize (the restrictions on) the range of grammars of natural languages. Grammars are restricted among other things by:

- innate linguistic predisposition (logically possible grammars are not attested because they are in conflict with innate linguistic predispositions)
- language learning (logically possible grammars are not attested because they cannot be learned).
- language processing (logically possible grammars are not attested because they cannot be processed efficiently).

- cognitive architecture
- etc.

Therefore, a particular typological generalization, e.g. generalization G above, may in principle be explained by any (combination) of these linguistic or extra-linguistic factors.

In the rule-base account the cross-linguistic generalization G does not follow from a particular grammar or the grammar formalism itself. The implicit claim is that the reason why certain grammars do not occur is extra-linguistic.

In the OT account the typological generalization does follow from the formalism. Does this mean that the reason for the non-occurrence of certain grammars is linguistic as opposed to being extra-linguistic?

5.6 Separating language knowledge and language use

Should language knowledge and language use be separated?

The rule-based account of DOM separates the grammatical rules from the extra-grammatical principles. This is in line with the claim made in Newmeyer (2002, p. 63):

Parsing ease, desire for functional differentiation, pressure for an iconic relationship between form and meaning, and so on are indeed forces that shape grammars. These forces influence adult speakers, in their use of language, to produce variant forms consistent with them. Children, in the process of acquisition, hear these variant forms and grammaticalize them. In that way, over time, certain functional influences leave their mark on grammars. There is no place – indeed no *need* – for the functional forces to match up in a one-to-one fashion with particular constraints internal to any particular grammar.

A consequence of this distinction is that it would therefore be possible to characterize the rules of a language with exceptional differential object marking pattern. “In Nganasan, from the Samoyedic group of the Uralic family, pronouns show no case distinctions while nouns inflect on an accusative pattern” (Dixon, 1994, p. 90).

If the grammar formalism makes essential reference to the principles which account for the distribution of DOM patterns, it is not clear how exceptional

DOM patterns can be described.

In the constraint-based account there is no clear separation between constraints representing language knowledge and constraints representing principles of language use: without the constraints representing the principles of language use it is not possible to describe which form-meaning pairs are part of a language and which aren't.

How does language use affect grammar?

From the rule-based perspective, the principles of language use restrict the change of rules, but they do not become part of the grammar.

From the OT perspective, it seems that the principles of language use (distinguish, be economical, etc.) have become part of the grammar.

5.7 The question of psychological reality

A grammar is psychologically real to the extent that:

- R1 The grammar characterizes the set of signs (i.e. form-meaning pairs) of a language.
- R2 The grammar is embedded in a procedure P which computes (the correct) meanings given strings and (the correct) strings given meanings.
- R3 There is evidence that our brains instantiate this procedure P.

Assuming that both the rule-based and the constraint-based grammars satisfy requirement R1, the question is whether they can be embedded into a procedure P for language processing.

It is not implausible to assume that correlations between formal and semantic structure are used by speakers/hearers to produce/understand expressions. (In fact, I would argue that such correlations are necessary for successful linguistic communication.)

Is it plausible to assume that the speakers/hearers first generate a (high) number of candidates and then select the optimal candidate? Put differently:

Could it really be the case that for each language, for each degree of definiteness, case marked and non-case marked objects are in a separate competition in speakers' heads with each other?

Newmeyer (2002, p. 75)

6 Conclusion

The following main claims have been made:

- In languages with differential object marking there are two different rules for combining an object sign with a verb sign.
- Extra-grammatical principles shape the rules, but these principles do not become part of the grammar.
- The language-specific combination of DOM-relevant semantic properties (of the object, verb or even subject) is modelled by means of conditions on the application of the rules for combining direct objects with verbs.

References

- J. Aissen. Differential object marking: Iconicity vs. Economy. *Natural language and linguistic theory*, 21:435–483, 2003.
- H. de Hoop and A. Malchukov. Case marking strategies. URL <http://roa.rutgers.edu/files/797-0106/797-H00P-0-0.PDF>. Manuscript, 2006.
- P. de Swart. The Case Mirror. Master Thesis, Radboud University Nijmegen, 2003.
- S. DeLancey. An Interpretation of Split Ergativity and Related Patterns. *Language*, 57(3):626–657, 1981.
- R. M. W. Dixon. *Ergativity*. Cambridge University Press, 1994.
- D. Farkas and K. von Stechow. Stability of reference and object marking in Romanian. Workshop on Direct Reference and Specificity, ESSLLI 2003, August 2003.
- M. Kracht. *Mathematics of language*. Studies in Generative Grammar No. 63. Mouton de Gruyter, Berlin, 2003.
- M. Kracht. Interpreted Languages and Compositionality. URL <http://kracht.humnet.ucla.edu/marcus/html/compositionality/cmp.pdf>. Manuscript, 2007.
- T. Mohanan. *Argument Structure in Hindi*. CSLI, Stanford, 1994.

- A. Næss. Case semantics and the agent-patient opposition. In *Case, Valency and Transitivity*, Studies in Language Companion Series 77, pages 309–327. John Benjamins, 2006.
- F. J. Newmeyer. Optimality and Funictonality: a Critique of functionally-based Optimality-Theoretic Syntax. *Natural Language and Linguistic Theory*, 20:43–80, 2002.
- K. von Heusinger and G. A. Kaiser. The Evolution of Differential Object Marking in Spanish. In E. Stark, K. von Heusinger, and G. A. Kaiser, editors, *Proceedings of the Workshop "Specificity and the evolution/emergence of nominal determination systems in Romance"*, Arbeitspapier 119, pages 33–69, Konstanz, 2005. Fachbereich Sprachwissenschaft.
- K. von Heusinger and G. A. Kaiser. Differential Object Marking and the Lexical Semantics of Verbs in Spanish. In M. Leonetti and G. A. Kaiser, editors, *Proceedings of the Workshop "Definiteness, Specificity and Animacy in Ibero-Romance Languages"*, Arbeitspapier 122, pages 83–109, Konstanz, 2007. Fachbereich Sprachwissenschaft.