

Optimal Thematic Interpretation

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ICCG2, Helsinki, September 6-8, 2002

1 The problem

- (1) **Variable semantic/thematic role Assignment by the German verb *schlagen* within the same construction** (cf. Vogel 1998)
- a. Sie hat den Nagel in die Wand geschlagen
she has the nail into the wall hit
 - b. Sie hat ein Loch in die Wand geschlagen
she has a hole into the wall hit
 - c. Sie hat den Hammer in die Wand geschlagen
she has the hammer into the wall hit
 - d. Der Hammer hat den Nagel in die Wand geschlagen
the hammer has the nail into the wall hit
 - e. Der Hammer hat ein Loch in die Wand geschlagen
the hammer has a hole into the wall hit
 - f. Sie hat den Nagel mit dem Hammer in die Wand geschlagen
she has the nail with the hammer into the wall
geschlagen
hit
 - g. Sie hat mit dem Hammer ein Loch in die Wand geschlagen
she has with the hammer a hole into the wall hit

Assume the following ‘conceptual scheme’ for ‘*schlagen*’ (‘beat/hit/strike’):

- (2) ‘Conceptual scheme’ for ‘*schlagen*’:
stage 1: before contact **stage 2: contact**



A moving entity *M* moves towards and finally hits against a target *T* in an event of the *schlagen* type.

The set of examples in (1) poses a problem for any theory of argument *linking*. The problem is the following:

Assume with Dowty (1989) that universal thematic role labels like AGENT, THEME, INSTRUMENT and GOAL are sets of *individual thematic roles*, i.e., of the particular thematic roles provided by individual verbs:

(3) **Individual thematic roles**

Given an n -place predicate δ and a particular argument x_i , the *individual thematic role* $\langle \delta, i \rangle$ is the set of all properties α such that the entailment

$$\Box[\delta(x_1, \dots, x_i, \dots, x_n) \rightarrow \alpha(x_i)]$$

holds.

(Dowty, 1989, 76)

(4) **Thematic Role Type**

Given a set T of pairs $\langle \delta, i_\delta \rangle$ where δ is an n -place predicate and i_δ the index of one of its arguments (possibly a different i for each verb), a *thematic role type* τ is the intersection of all the individual thematic roles determined by τ .

(Dowty, 1989, 77)

Thematic role types are usually determined by a cluster of (perhaps prototypical, cf. Dowty 1991) properties, as in the following example:

(5) **Proto-Patient** properties Dowty (1991):

- (i) undergoes a change of state
- (ii) incremental theme
- (iii) causally affected by another participant
- (iv) stationary relative to movement of another participant
- (v) does not exist independently of the event named by the verb

(6) The roles of *schlagen*:

Ind. Role	Univ. Role
M	THEME
T	GOAL

M is a typical THEME, a moving entity. T is a typical GOAL, the goal of a motion.

The structures in (1) all have the same syntactic structure, that of what Goldberg (1995) calls a *caused-motion construction*:

(7) The *caused-motion construction* (Goldberg, 1995, 160):

Sem	CAUSE-MOVE	<	cause	goal	theme	>
	↓		↓	↓	↓	
	PRED	<				>
	↓		↓	↓	↓	
Syn	V		SUBJ	OBL	OBJ	

(8) Principles of *argument fusion* (Goldberg, 1995, 50)

- a. *The Semantic Coherence Principle: Only roles which are semantically compatible can be fused.*
- b. *The Correspondence Principle: Each participant role that is lexically profiled and expressed must be fused with a profiled argument role of the construction.*

Principle (8-b) is basically about linking of roles to SUBJ and OBJ. From (8-a) we would expect the following scenario for the integration of verb and construction in (1):

(9) The expected fusion of the verb '*schlagen*' with the *caused-motion construction* (Goldberg, 1995, 160):

Sem	CAUSE-MOVE	<	cause	goal	theme	>
	↓		↓	↓	↓	
	SCHLAG	<		T	M	>
	↓		↓	↓	↓	
Syn	V		SUBJ	OBL	OBJ	

The examples in (1) show a much more liberal behaviour:

- (10) (1-a): M= \emptyset ; T=OBJ
(1-b): M= \emptyset ; T=OBL
(1-c): M=OBJ; T=OBL
(1-d): M=SUBJ; T=OBJ
(1-e): M=SUBJ; T=OBL
(1-f): M=OBL; T=OBJ
(1-g): M=OBL; T=OBL
- (11) Two observations:
- a. *Flexibility*: M can be SUBJ, OBJ, OBL and \emptyset . T can be OBJ or OBL.
 - b. *Restrictions*:
 - (i) T must be realised, but not as SUBJ.
 - (ii) If both M and T are ‘profiled’, then M must be SUBJ. (a consequence of i.)

My proposal for the solution of the problem in (12) is the following:

- There are only very weak restrictions on argument fusion as such
- Because of this, there is a wide range of options for the integration of the verb meaning with the meaning of the construction
- These patterns all compete as “candidate interpretations”
- The interpretations of the clauses in (12) are the winners of such a competition in an optimality theoretic fashion that uses hierarchised criteria like simplicity and plausibility for the evaluation.

2 Analysis

There are two options for the integration of verb meaning and construction meaning.

- (12) CAUSE-MOVE is composed of two actions, CAUSE and MOVE:

- a. The verb fuses with CAUSE ((1-a), (1-b), (1-d), (1-e), (1-f), (1-g))
- b. The verb fuses with MOVE ((1-c))

The rule for the caused-motion construction proposes (12-b) to be the rule, but in fact seems to be the exception. Motions can cause other things, of course, so this observation is not really unexpected from a conceptual point of view.

2.1 Blocking of optimal fusion

Assume that (1-c) in fact represents the best and simplest interpretation. Why is it inapplicable in some examples?

- A *nail* is a bad candidate for M, because we cannot hit it into walls directly, by holding it in our hands, or between our fingers, unless we are dealing with a very soft wall, and even in that case we would not ‘hit’ it, but rather press, push or pin it.
- A hole cannot move and it has no mass, so it cannot be M by definition.
- A hammer, as in (1-c) is a perfect candidate for M, so there is no need to assume that there is an *implicit argument*, another even bigger hammer, that is used for hitting the smaller syntactically realised hammer into the wall.

We might assume two principles:

- (13)
- a. *Plausibility*: An interpretation is a bad candidate, if it contradicts general world knowledge.
 - b. *Simplicity*: An interpretation that adds ‘invisible’ material is dispreferred.

These principles are ranked. The ranking must be the following:

- (14) *Plausibility* \gg *Simplicity*

The role of the *Simplicity* principle is also exemplified by the following minimal pair:

- (15) a. The balls are rolling away!
 b. The books are rolling away!

(15-b) can only have the interpretation that the books are located on some rollable vehicle, like a cart. This is enforced by the fact that books are not rollable by themselves. However, such an interpretation is usually blocked for examples like (15-a). As balls can roll by themselves, there is no need to assume a more complicated scenario.

The freedom in the generation of possible interpretation, as well as the principle of *Plausibility*, can be seen at work in examples like these:

- (16) a. Die Glocke schlug
 the bell tolled
 b. Die Tür schlug
 the door slammed
 c. *Der Besen schlug
 the broom beat/hit/...

It seems that the criterion distinguishing (16-a,b) from (16-c) is only, whether it is possible to infer the participants M and T. In order to do so, we use all resources we can:

- in (16-a), M is the bell's clapper, T its side. The element serving as SUBJ realises neither of these roles, but has both of them built into it!
- in (16-b), the door is interpreted as M, because under this condition T is inferrable as either the door frame or the wall surrounding the door. If the door is T, then M is not inferrable.
- in (16-c), neither option helps, if the broom is M, then T is not inferrable, and the same holds for M if the broom is T.

The criterion for the licensing of intransitive uses of a transitive verb is thus, whether the missing arguments can be inferred or not. How little is necessary, is shown by the following example:

- (17) Der Besen schlug nieder
 the broom hit down

Here, the particle *nieder* suggests that T could be the ground.

2.2 A Problem

It seems that there is a third option for the ‘fusion’ of construction meaning and lexical meaning, ‘no fusion’, as exemplified by (18):

- (18) Maria schlug den Bettler ins Gesicht
 M. hit the beggar-ACC in the face

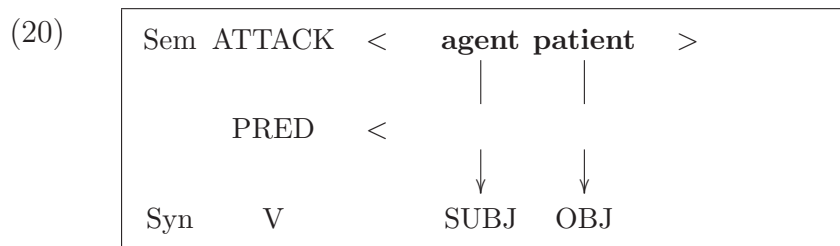
As the beggar does not undergo motion into his own face in the event described here, it seems that we are not having a caused-motion construction at all, although we have its syntactic structure. The individual role T is realised by OBL and M is unrealised, presumably Maria’s hand.

What goes on here, presumably, is that the verb is combined with a different construction, but that the result of this combination yields the same syntactic structure as its combination with the caused-motion construction.

Let us call this ‘other construction’ the *attack construction*, exemplified by clauses as in (19):

- (19) Mary hit/kicked/pushed/... John

For purpose of exposition, we might assume the structure of this construction like this:



What is missing here, is the directional PP. But we do not want to have it here. It comes into the clause to realise role T of the verb. We could perhaps assume a ‘directional-PP construction’ in addition.

The integration of verb and construction is now quite surprising. The verb ‘*schlagen*’ describes the mode of the attack, but neither SUBJ, nor OBJ actually realise one of the roles of the verb. M is unrealised, and T is the PP.

3 Conclusion

Argument fusion and fusion of lexical and construction meaning are much more liberal than Goldberg’s (1995) principles of *argument fusion* suggest:

- arguments of verb and construction might not or only partially be fused.
- the syntactic structure does not unambiguously indicate the ‘underlying’ construction.
- candidate interpretations for a particular syntactic structure are different ways of fusing the arguments of the verb with those of different possible constructions.
- the decision among these candidates is made by an evaluation on the basis of criteria like simplicity and plausibility, and perhaps even more, as proposed in the literature on Optimality Theory Semantics (cf. Hendricks & de Hoop (2001), Blutner (2000) a.o.).
- The mapping from syntax to semantics is much more indirect than standard theories of the “syntax-semantics interface” assume, and not at all as *mechanic* as has repeatedly been proposed.

References

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