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# An HPSG Analysis of German Depictive Secondary Predicates

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**Abstract**

I will provide German data that shows that depicitve secondary predicates may refer to subjects, direct objects, indirect objects, and even more oblique complements. Reference to more oblique arguments is more marked. The markedness corresponds to the obliqueness hierarchy that was proposed by Keenan and Comrie [13] and others. Based on these observations I will suggest analyzing depictive secondary predicates parallel to control constructions rather than raising constructions. Since depictives can refer to arguments that do not surface, the analysis makes reference to the underlying syntactic-semantic representation: the argument-structure.

## 1 The Phenomenon

The examples in (1) are sentences with adjectives as secondary predicates.

(1) a. Er ißt das Fleisch roh.
he eats the meat raw

b. Er ißt das Fleisch nackt.
he eats the meat naked

c. Er schneidet das Fleisch klein.
he cuts the meat small

d. Er ißt den Teller leer.
he eats the plate empty

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In (1a–b) the secondary predicate provides information about the state of the entity it refers to. In (1c–d) the result of an event is specified by the adjective. In this paper I will examine the properties of the predicates in (1a–b), so-called depictive predicates.

In German, uninflected adjectives and prepositional phrases may appear as depictive secondary predicates.

(2) a. Er liest das Buch nackt.
he reads the book naked

b. Er ißt die Äpfel ungewaschen.
he eats the apples unwashed

(3) Ich traf ihn (gestern) im dunklen Anzug. [3]
I met him yesterday in.the dark suit
'I met him in a dark suit yesterday.'

Depictive predicates may refer to subjects and to objects. [4] There is a strong preference for serializations where the depictive predicate follows its antecedent. [5]

(4) a. weil er die Äpfel ungewaschen ißt.
(He is unwashed or the apples are unwashed.)

b. weil er ungewaschen die Äpfel ißt.
(He is unwashed.)

c. * weil ungewaschen er / der Mann die Äpfel ißt.

(4a) has two readings, (4b) just one. Since the object follows the depicitive it cannot be an antecedent.

It is also possible to refer with depicitves to arguments that are not expressed at the surface although this is denied sometimes. [6] For example, Zifonun [33] gives the following example and claims that the depictive predicate cannot refer to the logical subject of the passivized verb. [7]

(5) Die Äpfel wurden ungewaschen in den Keller getragen.
the apples were unwashed in the basement carried
'The apples were carried to the basement unwashed.'

That the reading where the depictive refers to the agent of the carrying is hardly availible has semantic reasons. If the reading where the depictive refers to the logical object of the main verb is semantically implausible the reference to the logical subject of the main verb is fine:

[3] The example is taken from [8]. I added the adverb *gestern* to exclude the possibility of the PP modifying *ihn* directly.

[4] See also [22] for examples of predicates referring to nominative and accusative NPs.

[5] Lötscher [17] makes this observation explicit with regard to objects. See also [21] for examples from Dutch.

[6] See also [22], [7], and [18] on non-overt antecedents.

[7] Chomsky [2] and Jaeggli [9] make a similar claim for English. As the translations of the examples below show this claim is as wrong for English as it is for German.

(6) a. Das Buch wurde nackt gelesen.
the book was naked read
'The book was read naked.'

b. Das Buch ist nackt zu lesen.
the book is naked to read
'The book is to be read naked.'

In the same vain depictives may refer to non-expressed subjects in infinitival constructions with verbal complex (so-called coherent constructions (7a) and such without a verbal complex (incoherent constructions (7b).

(7) a. Er hat ihr nackt zu schlafen geraten.
he has her naked to sleep advised
'Naked, he advised her to sleep.'
'He advised her to sleep naked.'

b. Er hat ihr geraten, nackt zu schlafen.
he has her advised naked to sleep
'He advised her to sleep naked.'

In coherent constructions we have readings with reference to the subject of the embedded verb (*schlafen*) and to the subject and to the object of the matrix verb (*raten*). In the incoherent construction only the reference to elements that depend on heads in the respective coherence field is possible. Since *nackt zu schlafen* is a separate coherence field in (7b), *nackt* can refer to the subject of *schlafen* only. Since the subject of the controlled verb *schlafen* is coreferent with the dative object of the controllee, the element the depictive predicate refers to is visible at the surface. But it is also possible to omit the dative object of *raten*:

(8) Er hat geraten, nackt zu schlafen.
he has suggested naked to sleep.
'He suggested sleeping naked.'

Haider [6] claims that depictive predicates can refer to NPs with structural case only. According to Haider only nominative and accusative are structural cases while dative is not.

(9) a. Er sah sie nackt.
he saw her$_{acc}$ naked

b. Er half ihr nackt.
he helped her$_{dat}$ naked

In (9a) both the reference to the subject and to the accusative object is possible, while the reading with reference to the object is hardly availible in (9b). As Haider notes, this is explained easily by the assumption that the subject of the predicate and the NP it refers to are identical. The fact that in German, NP subjects always have structural case explains why a depictive element cannot refer to a dative NP, because dative is taken to be a lexical case.

Wunderlich [32] develops an analysis for depictives that constitutes of two different subanalyses: Depictives that refer to the subject (VP-adjuncts), and depictives that refer to the direct object (V-adjuncts). Therefore he predicts that reference to dative NPs is not possible.

Rothenstein [29] gives an English example that is equaivalent to the sentences in (10).

(10) a. Die Krankenschwester gab John krank die Medizin.
the nurse gave John$_{dat}$ ill the medicine$_{acc}$
'The nurse gave John the medicine ill.'

b. Die Krankenschwester gab John die Medizin krank.
the nurse gave John$_{dat}$ the medicine$_{acc}$ ill

Rothstein explains the impossibility of *krank* refering to *John* by a restriction that allows depictives to refer to agents and patiens, but not to goals.

However, the reference to dative NPs is possible:

(11) Nackt wurde ihm klar, daß sein Anzug wohl für immer verloren war.
naked became him$_{dat}$ clear that his suit possibly for ever lost was
'Naked it became clear to him that his suit was possibly gone for ever.'

What we see here is probably another instance of the accessability hierarchy that was observed in connection with a broad variety of phenomena as for instance ellipsis [16], topic drop (*Vorfeldellipse*) [4], non-matching free relative clauses [1,23,18,19], passive [13], and Binding Theory [5]. This hierarchy was originally proposed by Keenan and Comrie [13] and has the following form:

| | | | | | |
|---|---|---|---|---|---|
| SUBJECT => | DIRECT OBJECT => | INDIRECT OBJECT => | OBLIQUES => | GENITIVES => | OBJECTS OF COMPARISON |

This accessability hypothesis is further supported by passive examples:

(12) a. Ihr wurde nackt geholfen.
her$_{dat}$ was naked helped
'She was helped naked.'

b. John wurde die Medizin nackt verabreicht.
John$_{dat}$ was the medicine$_{nom}$ naked given
'John was given the medicine naked.'

In both sentences the reference to the dative NP is considerably better than in (9b) and (10), where another candidate for coreference appears at the surface. Of course both sentences in (12) have a reading where the helper or the nurse is naked, respectively. The reference to the dative NP improves considerably if the reference to the nominative is excluded by world knowledge.

(13) Man half ihm erst halbtot. [24]
one helped him only half.dead
'One helped him only half dead.'

And finally one can even find examples that have overt accusative objects and a depictive predicate that refers to a dative NP:

(14) Mangos werden manchmal als 'Badewannenfrüchte' bezeichnet, weil das saftige Fruchtfleisch Flecken hinterlassen kann, die schwer oder gar nicht zu entfernen sind. In den Tropen gibt man sie den Kindern meistens nackt zu essen. [8]

'Mangos are sometimes described as „bathtub fruits" because their juicy flesh can leave stains that are difficult to remove or even permanent. In tropical countries one usually gives them to the children when they are naked.'

The example in (14) was quoted from the "Hohlspiegel" which is part of the magazin *Der Spiegel*. The "Hohlspiegel" contains quotes from other publications that are either semantic nonsense of the kind *a dead man was killed* or ambiguous with a preference for a strange reading. Examples for the latter are ambiguities that are due to PP attachment. The sentence in (14) made it to the "Hohlspiegel" because the reading where *man* is the subject of *nackt* is the more common one syntactically. However from the context of the sentence it is clear that the children are naked.

From the data presented above it must be concluded that both the restriction of the case of possible antecedent phrases and the restriction of the grammatical role of the antacedent phrase are not adequate. In what follows I will therefore assume that the subject of the depictive predicate is coindexed, i.e., coreferent with the antecedent phrase, but not identical to it, as it was suggested by Haider.

The reference to NPs inside of PPs that are complements of a verb is hardly possible.

(15) daß Jan [mit Maria$_i$] nackt$_{*i}$ sprach.
that Jan with Maria naked talked
'that Jan talked to Maria naked.'

Kayne [12] gives an example for English, that is not transferable to Greman with a similar depictive construction.

(16) a. (?) Why, he's so enamoured of that chair, he'd even sit in it unpainted.
b. * Er ist ja so verliebt in diesen Stuhl, daß er sogar auf ihm / darauf ungestrichen sitzen würde.
c. * Er ist ja so verliebt in diesen Stuhl, daß er sogar ungestrichen auf ihm / darauf sitzen würde.

The only example with reference to an NP in a PP I could find so far is (17).

[8] From the magazine "Natur und Heilen", quoted from Hohlspiegel, Spiegel, 9/2000, p. 262

(17) Beim Betreten des Gehwegs sei er mit großer Wucht zu Boden geschleudert worden, wo er kurzzeitig das Bewußtsein verlor.

Noch am Boden liegend, sei auf ihn eingetreten worden. [9]

still on.the floor lying be on him PART(in).stepped got

'When he stepped onto the path he was violently thrown to the ground where he lost consciouness for a short period. While he was still on the floor he was kicked.'

Again, we have a passive sentence. The subject of *treten* was a police officer and therefore the reference of *liegend* to the logical subject of *treten* is excluded by world knowledge. The only remaining antecedent is the NP in the PP.

NPs in adjuncts are excluded from the list of possible referents of depictives.

(18) weil Karl$_i$ [neben Maria$_j$] nackt$_{i/*j}$ schlief.
because Karl near Maria naked slept

'because Karl slept near to Maria naked.'

I follow Winkler [31] in assuming that depictive predicates are adjuncts. Appart from prosodic facts that she discussed there is evidence form the linearization of depictives and from partial verb phrase fronting that suggests such an analysis. Depictive predicates can be serialized independently from their antecedent. They can be serialized rather freely in the clause and there is no restriction on the number of depictive predicates per clause. See [20] for data.

In order to establish the proposed coindexing between the subject of the depictive predicate and its antecedent element, the depictive has to have access to the complete underlying argument structure of the verb, since the antecedent not necessarily is realized at the surface.

## 2 The Analysis

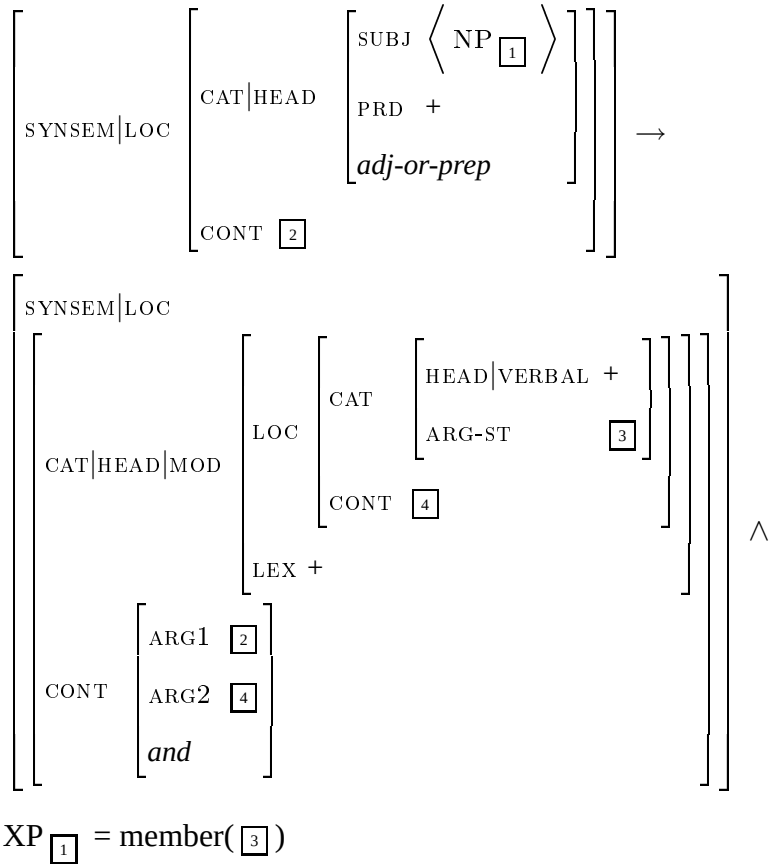
Since the discussion in the data section showed that the subject of the depictive predicate can be coreferent with a dative NP, a raising analysis cannot be adequate if dative is assumed to be a lexical case. Instead of assuming an analysis where the entire subject of the predicate is identified with the representation of its antecedent, I assume that only the referential indeces of the depictive and its antecedent element are identified.

The lexical rule in (19) maps a predicative element that can be used in copula constructions or subject or object predicatives onto a depictive secondary predicate. [10]

[9] taz, 10.06.2000, p. 21

[10] The semantic representation is of course a simplification. It is a place holder for whatever turns out to be the correct semantic representation for depictive predicates. For several different semantic patterns see for instance [24].

(19) Lexical Rule that maps predicative elements onto depictive predicates:



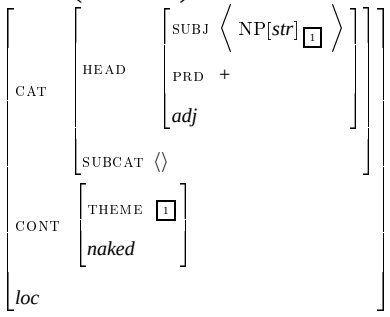

XP $\boxed{1}$ = member( $\boxed{3}$ )

I will demonstrate how this rule works with the examples in (9a) and (20).

(20) Er ist nackt.
he is naked

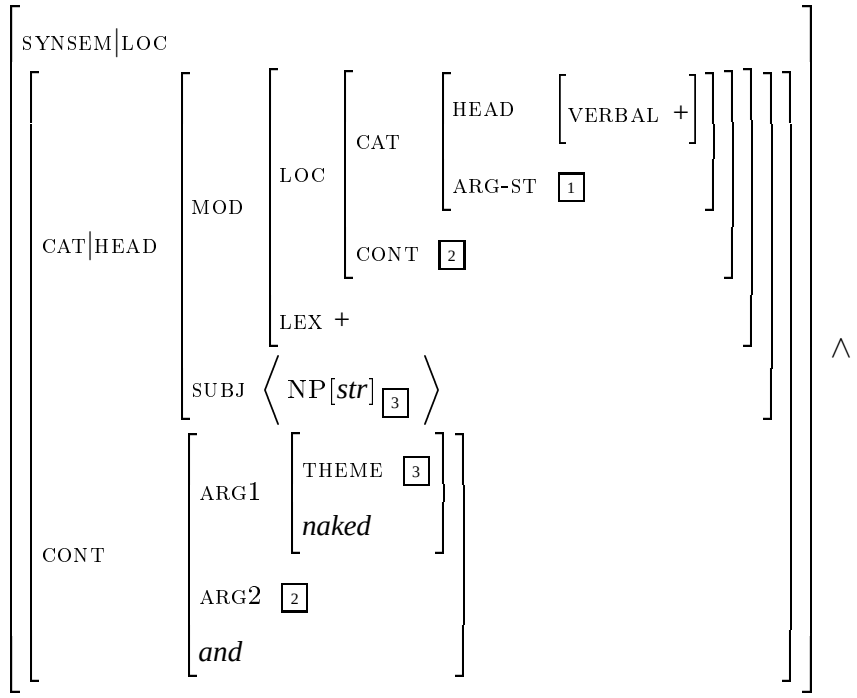
The LOCAL value of the entry for the predicative version of *nackt* that is used in copula constructions like (20) is shown in (21).

(21) *nackt* ('naked'):




The entry in (21) is the input for the rule (19). The result of the rule application is shown in (22).

(22)




$XP_{\boxed{3}}$ = member( $\boxed{1}$ )

Since the input specification requires a subject, subjectless predicates like for instance the subjectless version of the adjective *kalt*, cannot be input to the rule.

(23) Ihm ist kalt.
him$_{dat}$ is cold
'He is cold.'

The specification of the subject as referential rules out expletive predicates as input. [11]

(24) a. Es ist kalt.
it$_{expl}$ is cold
b. ? Es regnet kalt.
it$_{expl}$ rains cold

(24) means that the rain is cold, not that it is cold in general. It may be cold rain in warm weather. The predicate *kalt* cannot refer to the expletive nominal complement of *regnen*. The condition on referentiality cannot be imposed on the subject of the verb that is modified, since verbs with expletive subjects allow for depictives if these do not refer to the expletive element:

(25) Es trug ihn unangeschnallt aus der Kurve.
it$_{expl}$ carried him not.seat.belt.fastend out the curve
'He was carried out of the bend without having his seatbelt on.'

[11] Note that the *es* in (24a) is ambiguous between a referential and an expletive *es*. Only the expletive reading matters here.

In (19), the index of the subject of the input predicate (1) is structure-shared with the index of an element of the ARG-ST list of the element that the depictive predicates over. The ARG-ST list is a list that contains the complete argument structure of a predicate. Both subjects and other dependents of finite and non-finite verbs are members of this list. The structure sharing of the indices is equivalent to the structure sharings of a modified noun and a modifying adjective or adjectival participle. The modification of the verbal element can be seen as an instance of control: The depictive controls an argument of the verbal head.

The item at the left hand side of the *member*-relation is specified as an XP in (19). The rule admits the predication of depictives over subjects, direct and indirect objects and genitives. It also allows complement PPs to occur as antecedents of depictives, since complement PPs have a CONT value of the type *nom-obj*. That examples of reference to PP elements are hardly acceptable can be explained by their low accessibility on the scale.

Haider's approach is equivalent to identifying the complete SUBJ element of the input predicate with the left-hand side of the *member*-relation. It is a raising approach. Since subject NPs always have structural case, only reference to the subject and the direct object of the modifed verbal element is predicted to be possible. This is empirically wrong, as the data that was discussed in section 1 showed.

The coindexing analysis that has been developed here has interesting consequences for the overall architecture of the grammar. As Kaufmann [11] observed, the coindexation approach enforces the modification of lexical predicates if one assumes that the argument structure is represented only at lexical items. This is unproblematic for grammars with flat dominance structures for the German clause, but with binary branching structures it is not trivial to establish the coindexing. Figure 1 shows the standard analysis for (26) with binary branching dominance structures.

(26) weil er nackt der Frau hilft.
because he naked the woman helps
'because he helps the woman naked.'

*nackt* modifies the projection *der Frau hilft*, which is non-lexical and does not contain the argument structure. It is not possible to refer to the semantic contribution of *hilft*, which is, of course, contained in *der Frau hilft*, since *helfen* may be embedded under a modal or causative verb:

(27) weil sie ihn nackt der Frau helfen sieht.
because she him naked the woman help sees
'because she sees him help the woman naked.'

*sie*, *ihn*, and *der Frau* are dependents of the verbal complex *helfen sieht* [14,10,18].

To solve this problem one could project the argument structure. Kiss [15], and others suggest making ARG-ST a head feature. [12] The problem with the projection

[12] See also [26] for an analysis were the argument structure of certain words gets projected.

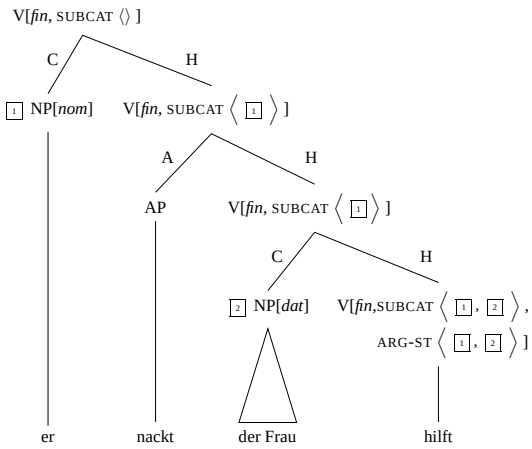



Figure 1. Binary Branching Structures and Depictive Predicates (Continuous)

of the argument structure is that it is incompatible with the standard approach for coordination in HPSG. In the standard treatment of coordination it is assumed that the CAT values of two coordinated elements have to be identical [25]. If we have coordinations of sentences that have ARG-ST lists of differing length, coordination fails.

(28) a. The woman sleeps and the man washes the dishes.
b. The man beats the dog and the child kicks the zebra.

Since the elements in the ARG-ST lists of *sleeps* and *washes* are still present in the maximal projections, coordination fails because these lists differ in length. The situation is even worse: (28b) cannot be analyzed either, since the projected ARG-ST list also contains semantic information and this information is incompatible (dog $\neq$ zebra). So, if we wanted to project the argument structure, this would have to happen outside of CAT. Furthermore, this projection of the complete argument structure violates locality since the internal structure of a maximal projection could be selected by governing heads.

Another possibility is to treat adjuncts as complements and introduce them into the subcat list of the head they modify [30]. Since then modification is treated in the lexicon, the combination of depictives and the predicates they modify can be established before argument saturation takes place. See [3] for a discussion and rejection of this approach. Some discussion of examples with depictives can be found in [20].

In [18] I assumed that adjuncts modify lexical elements for independent reasons. I will adopt his approach to adjuncts in general and will handle depictive secondary predicates in a similar way here. The lexical rule in (19) is set up accordingly. Depictives modify lexical elements or quasi-lexical elements, like verbal complexes. The analysis of (26) is shown in figure 2. DOM is a list valued feature that contains a head and its adjuncts and arguments [27,28,20]. The order of the DOM elements corresponds to their surface order. Elements that are combined may be non-adjacent as *nackt* and *hilft* in (26). Since depictive predicates may be iterated, the argument structure must be present at the mother node in head adjunct

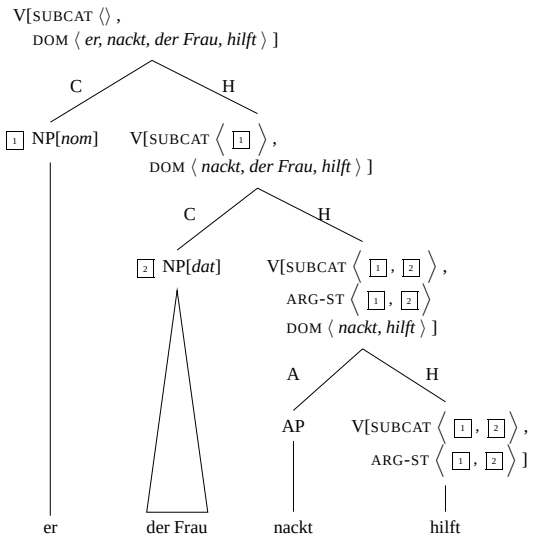



Figure 2. Binary Branching Structures and Depictive Predicates (Discontinuous)

structures.

Plank's coordination examples [24] in (29) are explained by a coordination theory that assumes that CAT values of conjuncts are shared.

(29) a. Der Gast trank das Bier stehend lauwarm.
the guest drank the beer standing lukewarm

b. * Der Gast trank das Bier stehend und lauwarm.
the guest drank the beer standing and lukewarm

The sharing of CAT values entails that the SUBJ values, which are located under HEAD, are shared and therefore depictive predicates that are coordinated must have the same antecedent.

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