# Partial Accommodation and Activation in Definites[1]

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**Abstract**

The notions *accommodation* and *binding* of presuppositions, as used in the DRT-based framework of Van der Sandt and Geurts, are critically assessed. Examples are presented which suggest the need for a narrower interpretation of, in particular, the term *accommodation* and the differentiation between accommodation proper and the process of presupposing hearer-old but discourse-new information. The notions are applied in a proposal for a new annotation scheme for information status, which is illustrated on some examples. The significance of the scheme is briefly demonstrated in a small study into the prosodic properties of a German corpus of radio news.

**Keywords:** information status, givenness, accommodation, DRT, discourse analysis.

## 1. Introduction

This paper discusses some well-known terminology from presupposition theory following the work of, primarily, Van der Sandt (1992) and Geurts (1999). In particular, I would like to take a closer look at the notions of "accommodation" and "binding", which have frequently been presented as a binary opposition. It is my concern to question this dichotomy but also to verify to what degree it is possible to employ the two concepts in a task that attempts to classify nominal expressions concerning their informational contribution, known under the keyword "information status" (Prince 1981, 1992). Information status theory starts out from the observation that the intuitive notions *given* and *new* are not sufficient to adequately describe the richness of referential and information structural variation found in natural language expressions. I want to argue

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that not only can we identify more than two clearly distinguishable (and information structurally meaningful) classes, but that there is, furthermore, the need for a precise formal specification; a task for which presupposition theory and Discourse Representation Theory are our tools of choice.

## 2. Binding and accommodation

The term *presupposition* has originally been understood as a pre-condition of a sentence that a context has to fulfil if the sentence is meant to be acceptable. However, already Karttunen (1974) noted that "ordinary conversation does not always proceed in the ideal orderly fashion" sketched in that sense. Whenever a presupposition is neither entailed nor excluded by the context and it is at the same time specified in sufficient detail[2], hearers will accept it as if it had been asserted. Since Lewis (1979) this process of acceptance is known as *accommodation*.

The work by Van der Sandt (1992) and Geurts (1999) comprises several important advancements in presupposition theory. First of all, the clear formal specification using DRT (Kamp 1981; Kamp & Reyle, 1993) allows for a systematic comparison of the broad variety of known presuppositional phenomena, the easy discovery of hitherto unknown presupposition triggers as well as their integration into a broader theoretical framework. Secondly, a new perspective on presuppositional phenomena is introduced, viz. the analogy between presuppositions and anaphors, which is probably most convincingly argued for in the field of definite descriptions, which on the one hand have been treated as prototypical presupposition triggers, requiring the identifiability of a somehow[3] unique referent satisfying the descriptive content, and, on the other hand, as expressions that have a great deal in common with pronouns and are, therefore, anaphors.

But it is not only individual type discourse referents that can be approached in terms of anaphora. On the contrary, any kind of presuppositional phenomenon can be rendered within the two-stage formalism offered by Van der Sandt and Geurts, and subsequently be subjected to comparison. The two stages consist in (i) the generation of

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[2] Compare „too" for a presupposition trigger where this is not the case (cf. Van der Sandt & Geurts (2001), Beaver & Zeevat (2007), Riester (2008b)).

[3] Uniqueness of definite descriptions, as has been noted a long time ago, is rarely ever "global uniqueness" but requires a controlled context, which may be implicitly or explicitly defined.

a so-called *preliminary presupposition* and (ii) its subsequent *projection,* which ultimately leads to sentence-internal or -external *binding* of the presupposition (or more precisely: its discourse referent) to a referent available elsewhere in the discourse. If no antecedent referent can be found in the discourse, then, according to the standard theory, it has to be accommodated. Accommodation preferably takes place at the level of the main discourse representation structure (DRS). In the following sections, however, I will demonstrate that often there are cases which superficially look like accommodation phenomena but which are in fact better described in terms of binding and for which I will use the notion *activation.* Note that there are other uses of this term in the literature that for all I can tell describe similar as well as less similar processes; compare, Chafe (1994), Lambrecht (1994), Arnold (1998), and Beaver & Clark (2008). What is essential for me at this point is that the term semantically captures exactly the process of bringing something to attention that was there but not in the immediate centre of attention. This stands in contrast to the *accommodation* cases, which I take to establish hitherto *completely unavailable* information.

*2.1. Binding, accommodation and activation in DRT*

This section glances over some well-known cases of presupposition resolution in the DRT framework, pointing out some unclear issues, which are responsible for a terminological and conceptual deficit of the existing theory. Compare the following examples.

(1) a. If John is married, his wife will be happy.
b. If John made coffee, his wife will be happy.

In (1a), the presupposition triggered by "his wife" is bound by lexical material in the antecedent clause, whereas in (1b) it projects to the sentence level where it gets accommodated; at least, this is how the story has been told on countless occasions.

However, if we are taking a closer look, what we really can observe from the formal DRT specification (figure 1) is that the set of two presuppositions triggered by "his wife" is only *partly* found in the antecedent clause.

In figure 1 we see the preliminary DRS generated by sentence (1a). The boxes preceded by the ∂ signs (Beaver, 2001) are unresolved presuppositions and correspond to the descriptive content of the possessive pronoun (male person) as well as to the possessive relation inherent to the genitive construction. The underlined discourse

referents (cf. Geurts, 1999; Kamp, 2001) differ from their non-underlined cousin in that they require anaphoric resolution.

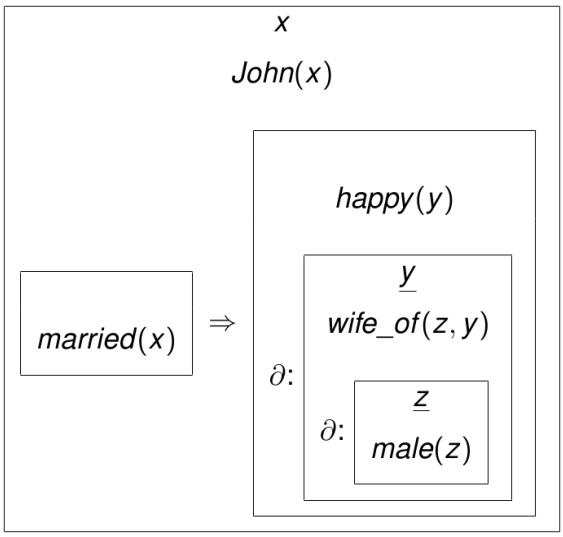


Figure 1: Preliminary representation of example (1a).

We start resolving the DRSs from the inside out. In figure 2, the inner presupposition has been projected along a path starting from its original location, via the box on the left-hand side, and up to the main level, while the discourse referent *z* has been bound to the referent denoting the person John.

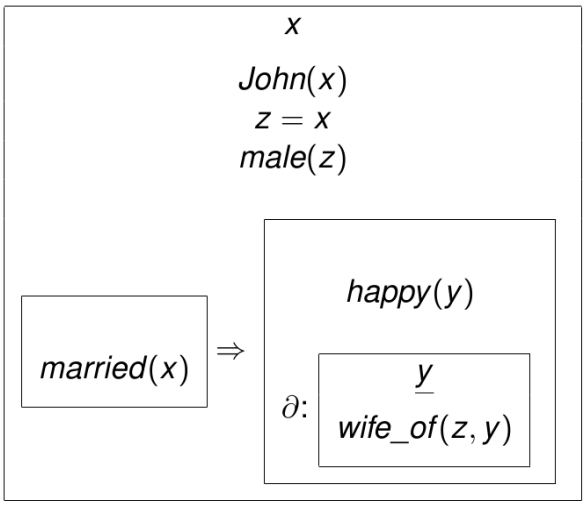


Figure 2: The innermost presupposition bound to x.

Now we try to proceed in an analogous fashion with the remaining preliminary presupposition. Intuitively John's having a wife is what follows from his being married, hence, we would like to be able to resolve and bind the presupposition to the information contained in the antecedent box. This is not possible right away, however, because what needs to be done first is to *create* a discourse referent for John's wife *u* in that box and then bind the anaphoric discourse referent *y* to *u* (figure 2b).

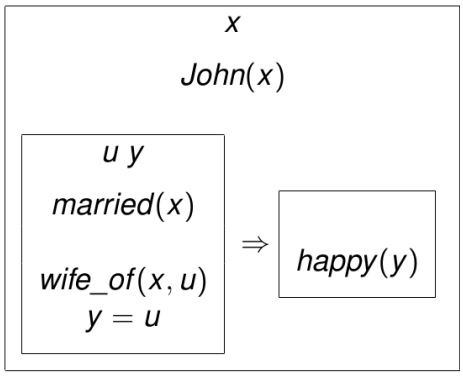


Figure 2b: Final representation of the discourse in (1a).

So, is this a process of accommodation? A mixture of binding and accommodation? I would like to argue that the process involved should not be called accommodation at all, neither are we dealing with binding in the strict sense. This case is quite different from one in which John's wife is mentioned without previous use of the word "married" and in which the hearer doesn't possess previous knowledge about John's marital status. In that case accommodation is needed. But in the present case we can think of John's wife as being uniquely available or accessible in a "marriage" scenario (figure 3), which is associated with the verb "married".

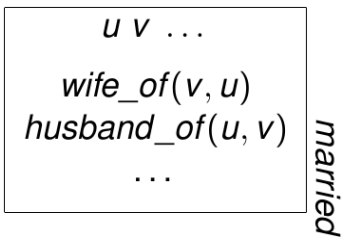


Figure 3: Simplified scenario context attributed to the word "married".

The attribution of the property "married" to John in the antecedent of the conditional triggers this scenario and this is where the "wife"-presupposition is resolved. From the perspective of the main discourse representation, what happens is that a copy of the information associated with *u* is created in the left-hand box of the conditional, whereupon *y* will get bound to *u*. In order to distinguish this process terminologically from accommodation while preserving some degree of analogy, I will henceforth speak of the process using the notion *activation*.

*Activation* (definition): the process of copying information from a contextually available resource into the discourse context which did not exist there before, and binding a presupposition to this information.

*2.2. Postponing new information*

A different case is represented by the examples in (2)

(2) a. Gerhard lives in Munich. The father of triplets is 42 years old.
b. I just met Fred's lawyer. She is really smart.

In both cases, we may say that the presuppositions triggered by the definite expressions in the second clause get anaphorically resolved or *bound* to the underlined expressions in the first clause. However, both cases also involve a certain degree of accommodation; in (2a) the entire descriptive content of the DP is accommodated and so is, in (2b), the information that the lawyer is a woman. The latter is shown in the transition from figures 4 and 5 (the discourse context and the representation of the second sentence of (2b)) to the integrated discourse context in figure 6.[4]

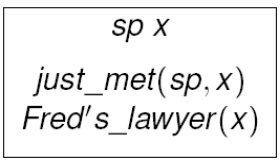


Figure 4: Discourse context after (2b-i).

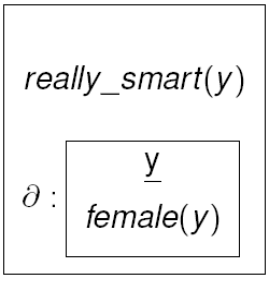


Figure 5: Contribution of (2b-ii).

[4] sp: "speaker"

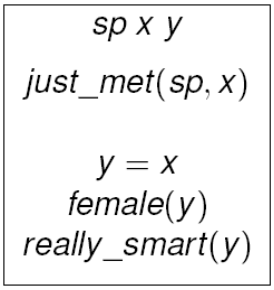


Figure 6: Integration of (2b-ii) into (2b-i).

Note that opposed to what we saw in the previous section, this is indeed a process of accommodation, as the "female" information existed nowhere except in the representation of the presupposition itself. Caveat: we could of course imagine a situation in which the sentences in (2) were spoken while it was already *common knowledge* that Gerhard had triplets or that Fred had a female lawyer although this information might not have been part of the recent discourse context. In such a situation we would have been justified to speak of *activation* once more, although the information involved would now have had to be copied from the hearer's *encyclopaedic* (or knowledge) context (Kamp, ms; Riester, 2008a,b) rather than being taken from a special scenario.

Summary: in this section, I argued in favour of distinguishing "pure" accommodation processes from cases where a presupposition gets bound to information available in context resources other than the discourse. Such a move is desirable in order to fight an excessive – and hence confusing – use of the notion *accommodation*. Not everything which looks like accommodation from the perspective of the discourse context (for instance, in cases where seemingly new information suddenly pops up) should necessarily be given that name. This observation is already present in Geurts (1999: 84), although it doesn't seem to have received much attention. Geurts remarked that the use of a name-like expression, e.g. "the moon", for the first time in a conversation does not trigger accommodation on behalf of the hearer but should rather be seen as an instance of binding because the moon is not an unknown entity [unlike, for instance, "the red dwarf star Gliese 581", A.R.]

## 3. From definiteness to information structure

### *3.1. (De)accented definites*

In Umbach (2002), we are provided with the following minimal pair of sentences in (3).

(3) {John has an old cottage.}
   a. Last summer he reconSTRUCted the shed.
   b. Last summer he reconstructed the SHED.

Umbach calls the object DPs "given definite" (3a) and "non-given definite" (3b), respectively, though we will see that these initially appealing terms will have to be used with great caution, as it is desirable to integrate the cases in (3) into a broader network of information status categories, which in some sense all have to do with given and new information.

It is unquestionable, however, that the prosodic difference present in the two examples corresponds with clear meaning differences, which we will now examine a bit more closely. Obviously, in (3a) "the shed" is used to refer back in a somewhat disrespectful manner to John's old cottage. In (3b), on the other hand, "the shed" refers to an entity which is new to the discourse, and which is understood to be a different kind of building than what we have just called a cottage. Nevertheless, this new object is in some manner *related* to John's old cottage.

In the DRT framework employed here, the contribution represented by the presuppositional expression "the shed" is in both cases the one in figure 7.

$$\partial: \boxed{\underline{y} \quad shed(y)}$$

Figure 7: Presupposition triggered by "the shed".

From what we learnt in the previous section, we may again assume that different contexts play a role in resolving the presupposition. (3a) is of course the standard case of a presupposition being bound in the discourse context – compare figures 8 and 9.

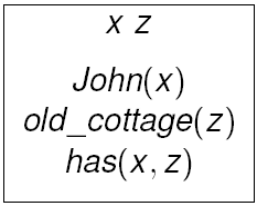


Figure 8: Discourse context before...

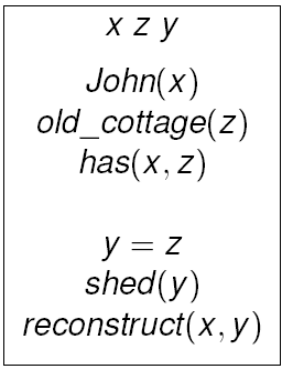


Figure 9: ... and after integration of (3a).

(3b), on the other hand, requires what we already encountered in connection with example (1a) – the usage of a special scenario, without which the referent of the expression "the shed" remains unidentifiable. Hence, analogous to figure 3 above, I postulate the use of a "cottage" scenario (figure 10), which includes a number of entities prototypically associated with cottages – for instance a shed for storing tools.

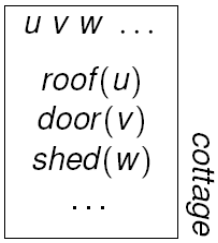


Figure 10: Scenario "cottage".

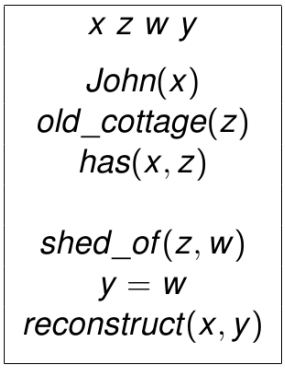


Figure 11: Integration of (3b) into discourse context using activated information.

As in the abovementioned case, we expect the relevant piece of information [*w*: *shed(w)*] to be copied (activated) from this "cottage scenario" into the discourse context where it can serve as the antecedent binding the anaphor.

*3.2. Focus*

An immediate complaint against the story just presented might be that the influence of focus has been completely neglected. Indeed, from what we know about focus since Selkirk (1984) and Rooth (1985, 1992) we should expect the accent on "SHED" to generate a focus feature in the syntax. The focus, then, triggers a presupposition to the effect that a set of alternatives must be identified. We certainly don't seem to be on the wrong track if we assume that the set of alternatives triggered by the focus in (3b) consists of just the kinds of elements that we already postulated as being part of the "cottage" scenario in figure 10.[5] Hence, why wasn't focus mentioned in the previous section?

This has to do with the more general perspective intrinsic to the annotation task that we are adopting. When labelling written text, accenting information as exemplified in (3) is usually not available. Nevertheless, the reader of a text is forced to make choices like that between the interpretation of "the shed" in (3a) and (3b) again and again. For the most part, it is contextual information provided by the text that enables such choices. Compare the discourses in (4a) and (4b).

(4) a. When John set out to repair his old cottage he started with the roof, then went on with the shed and finally painted the façade in a lovely mint green.
b. John inherited an old cottage, but quite frankly it was in such a bad shape that his first impulse was to tear the shed down and sell the land to a fast-food chain.

What is most directly available in ordinary text is the information status of the nominal expressions contained in it, not necessarily the focus-background structure of the sentences, although clues for the latter are also sometimes available (Riester, 2008b) and although information status (givenness) is, of course, not independent of information structure (Schwarzschild, 1999). Nevertheless, when analysing text, the first thing we should do is to ask the question in what sense the terms occurring in it are given. This is a feasible enterprise that we shall address in the next section.

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[5] This would mean to postulate an *implicit* contrast between equal siblings such as "the shed", "the roof" etc, which are all, in some sense, parts of one and the same cottage. Another way to interpret the example is to assume an *explicit* contrast between "the shed" and "the cottage". The contrast, in that case, involves elements from a (mereological) *scale*.

*Focus*, on the other hand, is a highly theory-loaded concept, which cannot be annotated as easily. We possess by now an impressive body of ideas that describe what the core features of focus are, cf. Beaver & Clark (2008). Nevertheless, there is still no consensus with regard to the question how many different (prosodic or morphosyntactic) realisations of focus there are (or whether this is can actually be a matter of counting at all). Quite certainly, there is not just a unique "focus accent", but contextual features – among which information status but also different types of contrast – are likely to influence how focus is realised prosodically. Calling "the SHED" in (3b) a focus is therefore not wrong but unfortunately a bit too simplistic.

As a resume, using capital letters to represent focus is an acceptable way for a linguist to indicate where s/he wants a focus to be located (mostly, in an isolated sentence or well-controlled discourse) but if our long-term goal is to investigate the prosodic details based on a finer-grained semantic classification of information status, then, in this connection, focus semantics (e.g. in terms of alternatives) is simply of no help.

## 4. Information status revisited

### *4.1. Terminology*

Recently, there has been an increased interest in the question of how to annotate information status. In Riester (2008a), I have compared my own approach to the frameworks provided by Nissim et al. (2004), by Götze et al. (2007) and to the "classical" approach by Prince (1981, 1992).

The approaches have more or less in common that all of them provide information status labels for expressions that refer back to material that is available in the previous discourse (*discourse-given, old, given, textually evoked*), in the hearer's knowledge context but not in the discourse (*generally accessible, generally mediated, unused*), in the speaker environment (*situative, accessible-situation, mediated-situation, situationally evoked*) as well as material that can be inferred from the previous discourse without being coreferential (*bridging, accessible-inferred, mediated-inferred, inferable*). Also problematic is the label *new*, which is sometimes used to only describe (certain) indefinite expressions but in other cases to also cover definite expressions referring to known persons or places that occur in a discourse for the first time; compare the label *new-unused* in Prince (1981). The reader may verify that this issue is very closely

related to the problem I discussed in section 2.1 regarding the insufficiently delimited use of the notion *accommodation* in cases where information is addressed that is discourse-new but hearer-old (see also Riester 2008b).

### *4.2. The classification*

The information status taxonomy employed in Riester (2008a,b) is grounded in formal semantic theories of presupposition and discourse. While partly (though not entirely) compatible or overlapping with previous approaches, it offers a reanalysis of information status which can be summarized as *"information status categories (at least for definites) should reflect the default contexts in which their presuppositions are resolved"*. There should consequently also be a category for expressions that cannot be bound but must be accommodated. The default contexts that we are assuming are the discourse context, the environment context (Kaplan, 1989), the encyclopaedic context of the hearer (Kamp, ms.) as well as scenario contexts like the ones introduced above in sections 2.1 and 3.1. In a current project a corpus containing about 3000 sentences[6] from transcriptions of recorded German radio news bulletins has been annotated according to the scheme presented in Riester (2008a,b), briefly repeated below. The annotation tool we used was SALTO (Burchardt et al. 2006).

#### *4.2.1. Environment context*

Expressions that refer to items within the environment context (deictic expressions such as "today", the discourse participants, demonstratives referring to objects in the speaker situation and so forth) receive the label *situative*. An example is shown in figure 12.

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[6] The radio corpus described here was recorded half-hourly during three consecutive days. Necessarily, it contains many repetitions of the same news features. Those repetitions were skipped during the annotation process as were the weather forecasts.

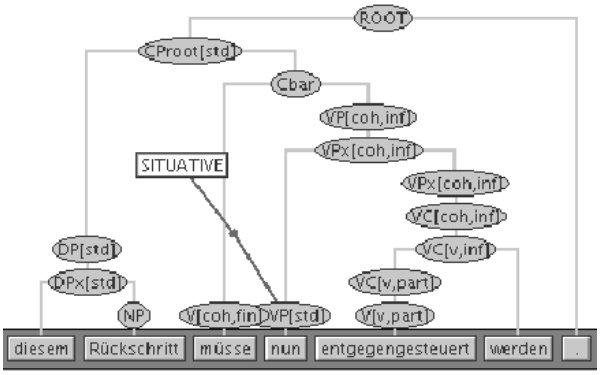


Figure 12: "This setback needs to be counteracted now."

*4.2.2. Scenario contexts*

Definite expressions that can only be understood in the context of a previously mentioned entity receive the label *bridging*, compare figure 13.

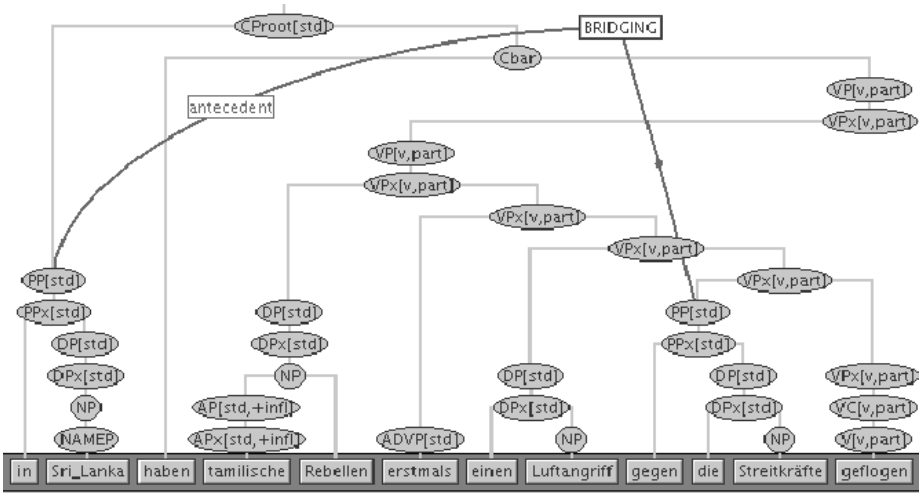


Figure 13: "In Sri Lanka, Tamil rebels have for the first time flown an airstrike against the armed forces."

*4.2.3. Encyclopaedic context vs. accommodation*

In every news text, we can find first-mention references to places, people, events and the like. Naturally, such entities can be sorted on a scale ranging from well-known to completely unknown. The situation is complicated by the fact that different hearers need not possess the same amount of knowledge with regard to certain entities (see the discussions in Riester 2008a,b). Nevertheless, a rough classification into unknown (to-

be-accommodated) and known (activatable) entities is possible. The respective labels we are using are *accessible-via-description* (figure 14) and *accessible-general* (figure 15). Underspecification or ambiguitiy can be represented by assigning both labels at the same time and by ranking them.

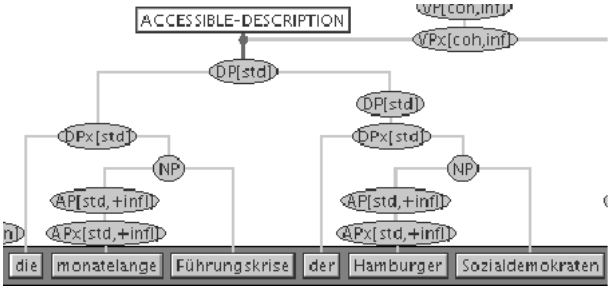


Figure 14: "the leadership crisis lasting for months among the Hamburg social democrats"

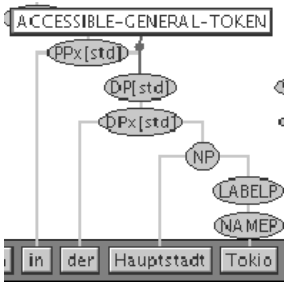


Figure 15: "in the capital Tokyo"

*4.2.4. Discourse context*

In the scheme employed here, as in most others, discourse givenness is understood as being equivalent to coreference. This is not entirely uncontroversial, especially if the concept is to be generalised from referential phrases to words. For our purposes, however, coreference provides the strong advantage of logical clarity. The scheme distinguishes several subclasses of discourse givenness, four of which I will list below.

*4.2.4.1. D-given-pronoun.* This is the label attributed to entities referred to by a pronoun.

*4.2.4.2. D-given-repeated.* Whenever an entity is picked up again using literally the same string as before (e.g. Fred ... Fred) its second mention will receive this label.

*4.2.4.3. D-given-short.* This label is used for shortened forms of previously mentioned items. Example: Federal Chancellor Angela Merkel ... Merkel.

*4.2.4.4 D-given-epithet.* We are using this label to mark examples involving referential binding combined with accommodation of descriptive material like the one discussed above in section 2.2, repeated here.

(2) a. Gerhard lives in Munich. The father of triplets is 42 years old.

Epithets are, traditionally, postponed descriptions, nicknames or titles of honour conventionally given to persons from history or legend, such as in "Alexander the Great" or when Homer uses the phrase "the horse tamer" to refer to the Trojan prince Hector. Our use of the term *epithet* is, however, technically defined as an expression which is on the one hand anaphoric but on the other hand introduces new information, which is not necessarily the case for many classical examples.

In integrating this term into our information status vocabulary, we therefore perform a slight meaning extension, which enables us to capture a previously insufficiently described linguistic phenomenon. The category label *d-given-epithet* replaces the earlier proposal *d-given-synonymous*, which we used previously and which was criticised by several commentators as terminologically inappropriate.[7] Synonyms are lexical terms that have the same meaning (*Sinn*) and can generally be exchanged for each other. While in (2a) "Gerhard" and "the father of triplets" refer to the same entity and, hence, in some sense do have the same meaning (*Bedeutung*), they can hardly be called synonyms.

*4.3. Labelling semantic examples*

To round up the discussion from above, here is an overview on how the examples described in this paper would get classified using the proposed labelling scheme.

(1) a. If John is married, [$_{\text{bridging}}$ [$_{\text{d-given-pronoun}}$ his] wife] will be happy.
b. If John made coffee, [$_{\text{accessible-via-description}}$ [$_{\text{d-given-pronoun}}$ his] wife] will be happy.

(2) a. Gerhard lives in Munich. [$_{\text{d-given-epithet}}$The father of triplets] is 42 years old.
b. I just met Fred's lawyer. [$_{\text{d-given-epithet/d-given-pronoun}}$[8]She] is really smart.

(3) {John has an old cottage.}
a. Last summer he reconSTRUCted [$_{\text{d-given-epithet}}$ the shed].
b. Last summer he reconstructed [$_{\text{bridging}}$ the SHED].

[7] „Epithet" is a spontaneous proposal by Larry Horn (p.c.) who was among those to criticize the use of "synonymous" in the described cases.

[8] As happens from time to time in the area of discourse givenness, several labels can apply simultaneously. The SALTO tool allows for ambiguous labeling in such cases.

*4.4. A glance at prosody*

A text labelled for information status is particularly well suited for investigations into formal characteristics such as prosody or constituent order. In work which is currently being done at the Institute for Natural Language Processing in Stuttgart, we are investigating phonological and phonetic properties of the spoken realisations corresponding to the transcribed radio text (Schweitzer et al. 2008).

In a smaller corpus consisting of 500 sentences, whose spoken realisation was independently annoted for pitch accents according to the (G)ToBI scheme (Mayer, 1995), we had a look at the last accentable syllables of all expressions labelled for information status (only unambiguous ones). While we did not detect exclusive correspondences between IS labels and pitch accent types, we found significantly different distributions of pitch accents (or their absence) between, for instance, the categories *accessible-via-description* and *accessible-general.* Table 1 shows, for instance, that L*H is by far the most frequent accent in the *accessible-general* category whereas the pitch accents found for *accessible-via-description* are more evenly distributed.

| GToBI accent | accessible-via-description | accessible-general |
|---|---|---|
| H* | 6 | 2 |
| HH*L | 0 | 1 |
| !H*L | 5 | 1 |
| H*L | 7 | 14 |
| L*H | 11 | 56 |
| L*!H | 4 | 1 |
| L*HL | 1 | 2 |
| NONE | 17 | 9 |

Table 1: Pitch accent distributions for *accessible-via-description* and *accessible-general* categories.

I acknowledge that that the data presented here can only provide a first impression. Investigations on a larger scale are on the way.

## 5. Conclusion

In this paper, I have tried to argue, on the one hand, in favour of a formally more stringent and detailed classification of information status and on the other hand for a more careful use of the term *accommodation*. While a lot of work remains to be done, I hope to have given the reader some impression of the possibilities that a formally rigid annotation scheme applied to natural language data may offer. While a lot of research has already been conducted on the prosodic properties of *focus*, we are only beginning to understand that *information status* has its own reflexes in intonation[9]. I would like to end with two open questions that I think should be addressed soon.

1. Where in a phrase is information status prosodically marked? (Note that the results in section 4.4. only pertain to the last accentable syllable but there is obviously a lot more going on in the course of the entire phrase.)

2. How can we get a grip on the distorting prosodic influence of *contrast*, which is not fully captured by annotations of information status in written text?

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[9] Note also the work by Baumann (2006).

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