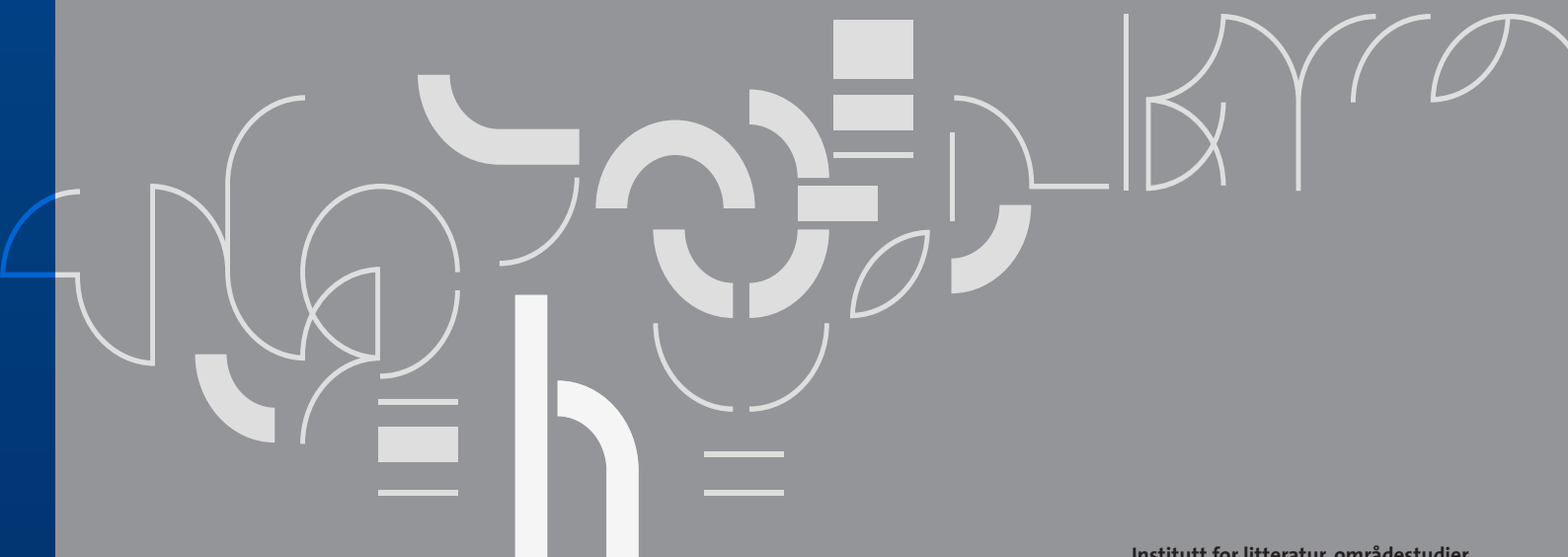# Contrast and Underspecification. The Semantics of aber and doch

Elena Karagjosova
ILOS
University of Oslo

Contrast and Underspecification.
The Semantics of *aber* and *doch* *

Elena Karagjosova
ILOS
University of Oslo

elena.karagjosova@ilos.uio.no

Abstract

I present an unitary analysis of the German adversative connectors *aber* and *doch*, based on Sæbø (2003), where the semantics of these connectors is defined in terms of a presupposition involving negation and topic alternatives. I argue that the meaning of *aber* and *doch* is underspecified between various types of contrast and that the type of contrast they indicate in particular context is determined by the configuration of topic alternatives at hand, which in turn is correlated with the particular syntactic and prosodic properties of the connectors in the concrete discourse as well as with the type of discourse (coordination, dialogue) in which the connectors are used. Finally, I sketch an underspecified semantic representation of the meaning of *aber* and *doch* and hint at a disambiguation algorithm that allows the bottom up construction of discourses with these connectors starting from their underspecified representation and employing information about their syntactic and prosodic properties as well as about the information structure and the discourse structure of the particular context in which they occur.

1 Introduction

The precise meaning specification of discourse connectors is a longstanding linguistic challenge. One of the reasons why the meaning of these words is so hard to grasp is related to their great ambiguity: depending on the context in which they are used, discourse connectors may express various relations between different discourse objects. Another problem is related to the lack of sound formal definitions of the discourse relations that connectors may express.

In this paper, I present an unitary analysis of the German adversative connectors *aber* and *doch*, based on Sæbø (2003). Sæbø proposes a full specification of the semantics

---

of the adversative conjunction *aber* on the basis of a precise notion of contrast which involves negation and topic alternatives. I show that Sæbø's definition of contrast is extendable to uses of *aber* not considered by Sæbø, as well as to all uses of the other main adversative German connector *doch*. I also provide an analysis of the contextual conditions under which a particular interpretation of the connectors arises and propose a semantic representation of *aber* and *doch* where the meaning of these connectors is lexically underspecified between these different interpretations. Finally, I hint at a disambiguation algorithm that allows the bottom up construction of discourses with *aber* and *doch* starting from the underspecified representation of their meaning and utilizing information about syntactic and prosodic properties of the connectors as well as about the information structure and the discourse structure of the concrete discourse in which they occur.

2   The problem

The German discourse connectors *aber* and *doch* express various relations, such as semantic opposition, concession and correction. There is a partial overlap between *aber* and *doch* with respect to the relations they may indicate. For instance, both *aber* and *doch* may express semantic opposition, as in (1), where two mutually exclusive properties are contrasted:

(1)   Hans ist reich, $\left\{ \begin{array}{c} \text{aber} \\ \text{doch} \end{array} \right\}$ Peter ist arm.
       'Hans is rich but Peter is poor.'

Further, they may express concession[1], as in (2), which expresses the denied expectation that catholics normally go often to church:

(2)   Peter ist katholisch, $\left\{ \begin{array}{c} \text{aber} \\ \text{doch} \end{array} \right\}$ er geht nicht oft in die Kirche.
       'Peter is a catholic but he doesn't go often to church.'

Finally, both *aber* and *doch* can express correction, as in (3), where speaker B contests the validity of the preceding assertion, here by asserting the sheer opposite:[2]

(3)   A: Es stimmt nicht, dass Peter verreist ist.
       'It is not true that Peter has left.'
       B: Es stimmt $\left\{ \begin{array}{c} \text{aber} \\ \textit{doch} \end{array} \right\}$.

---

[1]I call here concession both relations known as "denial of expectation" and "concessive opposition" which have been shown to be different instantiations of one and the same underlying concessive scheme, cf. Grote, Lenke and Stede (1997).

[2]Small capitals denote accent.

'But it IS true.'
B': Doch.
'It IS correct.'

The fact that *aber* and *doch* are not fully synonymous is attested by cases like (4) where in (4-a) *aber* expresses a rather weak denial, whereas *doch* in (4-b) expresses a straightforward correction:

(4)   A: Peter kommt mit ins Kino.
       'Peter is coming with us to the cinema.'
    a.   B: Er ist aber verreist. (Wie ist das möglich?)
          'But he has left. (How can then this be?)'
    b.   B: Er ist doch verreist. (Das kann nicht sein!)
          'He has left, as you should know. (This cannot be true!)'

Further, there are cases like (5)-(8), where only *doch* can be used. In (5), (7) and (8), *doch* expresses correction, and in (6) concession (denial of expectation).[3]

(5)   A: Peter kommt nicht mit ins Kino.
       'Peter is not coming to the cinema.'
       B: Er ist also $\left\{ \begin{array}{c} \text{DOCH} \\ \text{*aber} \end{array} \right\}$ verreist.
       'So he has left, after all.'

(6)   Das Pferd war klein, seine Beine waren kurz, und $\left\{ \begin{array}{c} \text{DOCH} \\ \text{*aber} \end{array} \right\}$ war es der schnellste
       Renner weit und breit.
       'The horse was small, his legs were short, and yet he was the fastest runner far and wide.'

(7)   A: Es stimmt nicht, dass Peter verreist ist.
       'It is not true that Peter has left.'
       B: $\left\{ \begin{array}{c} \text{DOCH} \\ \text{*Aber} \end{array} \right\}$.
       'Yes it is.'

(8)   Peter kommt nicht mit, oder $\left\{ \begin{array}{c} \text{DOCH} \\ \text{*aber} \end{array} \right\}$?
       'Peter is not coming along, is he?'

As the data suggests, the different uses and interpretations of *aber* and *doch* possess different syntactic, prosodic and discourse-structural properties. I.e. they may occur in the forefield, before the forefield or in the middle field of the German sentence, they

---

[3]Of course, *aber* can be used in (6) instead of *und*, which is a further evidence that *aber* and *doch* are not fully synonymous since they can nonredundantly cooccur in one and the same clause.

may be accentuated or not, and they may be used in coordinated clauses or in denial sequences in dialogue.[4]

The most challenging question that poses itself with respect to the semantics of discourse connectors in general, is, whether, and how the different uses and interpretations of a connector can be assigned a basic meaning. This question is typically answered for adversative connectors like *aber* and *doch* by assuming a basic meaning "contrast", however without further defining this notion. Consequently, the more fundamental question should be how to define the notion of contrast in a precise and flexible enough manner such that it accounts for the various uses of contrastive connectors like *aber* and *doch*. At least as important is the reverse question, namely how can the various interpretations of a connector be derived from its basic meaning. Answering this question presupposes a thorough analysis of the correlations between the various uses of a connector and its particular syntactic, prosodic and discourse-structural properties on the one hand and the particular interpretation it gets on the other.

In my proposal, I address these questions by drawing on a notion of contrast that seems to fulfill the requirements of precision and flexibility mentioned above, namely that specified in Sæbø (2003), where based on this notion a full specification of the meaning of the conjunction *aber* is proposed. I present Sæbø's analysis of *aber* next.

3   The contrast presupposition of *aber*

The main idea in Sæbø (2003) is that semantic opposition is the basic contrast relation expressed by *aber* from which other kinds of contrast such as various forms of concession can be derived as a result of generating conversational implicatures based on Grice's Maxim of Relevance. The main observation is that the discourse relation of contrast interacts with information structural contrast, namely contrast between topic or focus alternatives.[5] More precisely, Sæbø argues that the contrast between two conjuncts C_1 and C_2 expressed by *aber* can be seen as a semantic opposition between the topic of the *aber*-clause C_2 and an alternative to the C_2-topic that is provided by the first conjunct C_1. Thus contrast that in general consists in attributing "mutually exclusive sentence frames to two different things", can be formulated as "the first sentence contradicts the result of replacing the topic in the second sentence by an alternative in the first sentence". For instance in (9), replacing the topic of C_2, *mittlere*, for the topic of C_1, *kleine*, would lead to the two contradicting assertions (9-a) and (9-b):

(9)   [Für [kleine]$_T$ Betriebe hält sich der Schaden noch in Grenzen]$_{C_1}$; [für [mittlere]$_T$ aber wird er allmählich ruinös]$_{C_2}$.
        'For small companies, the harm is yet limited; for intermediate-size companies, however, it is becoming ruinous.'
        a.   Für kleine Betriebe hält sich der Schaden noch in Grenzen.

---

[4]The sentence equivalent *doch* (cf. (7)) can also be used in confirmation moves, where it also expresses correction, in this case a correction of an assumed contrary opinion as argued in Karagjosova (2006).

[5]An analysis of *aber* based on similar observations is proposed in Umbach (2005).

      b.   Für kleine Betriebe wird der Schaden allmählich ruinös.

Based on this observation, Sæbø specifies the basic meaning of *aber* in terms of an assertion and a presupposition in dynamic semantics in the following way: *aber* in a construction 'ϕ *aber*' asserts the sentence ϕ and triggers a presupposition that requires that the context σ contradicts the result of substituting the topic T of the *aber*-clause with an alternative α. Formally:

(10) $\sigma \; [\![\phi \text{ aber}]\!]\tau$ iff $\sigma \models \neg\phi[T(\phi)/\alpha]$ for some alternative α and $\sigma \; [\![\phi]\!]\tau$

On closer inspection, the definition can be further strengthened with respect to the context σ and the alternative α: it is always the preceding clause C_1 in a construction 'C_1 *aber* C_2' that provides both the alternative and the context in which the presupposition must be verified.

Consider again (9), repeated below as (11). After substituting the topic of the *aber*-sentence, *mittlere*, for the alternative, here the topic of C_1 *kleine*, we get that the harm for small companies is not ruinous. This is entailed by C_1, which here represents the context σ, since C_1 asserts that the harm is limited.

(11)   [Für [kleine]$_\alpha$ Betriebe hält sich der Schaden noch in Grenzen]$_{C_1}$; [für [mittlere]$_T$
          aber wird er allmählich ruinös]$_{C_2}$.
          $\sigma \models \neg\phi[T(\phi)/\alpha]$ iff
          $\sigma \models \neg$(für mittlere Betriebe wird der Schaden ruinös)[mittlere/kleine] iff
          $\sigma \models \neg$(für kleine Betriebe wird der Schaden ruinös)

Sæbø considers further cases where the topic and the alternative cannot be identified as straightforwardly as in cases involving contrastive topics such as (9). In (12), the contrast presupposition is falsified if we take *kurz* to be the topic and *steil* the alternative:

(12)   Die Waldwege sind [steil]$_{\alpha?}$, aber [kurz]$_{T?}$.
          'The forest paths are steep but short'.
          $\sigma \models \neg\phi[T(\phi)/\alpha]$ iff
          $\sigma \models \neg$(die Waldwege sind kurz)[kurz/steil] iff
          $\sigma \models \neg$(die Waldwege sind steil)

The reason is that *kurz* is rather the focus of the *aber*-sentence. According to Sæbø, in cases like (12), an *implicit topic* must be reconstructed in order to get the contrast right and the presupposition verified. The "implicit topic" is in general the complement of the apparent focus. Thus in (12), the implicit topic is *lang*. With this "topic", the contrast makes more sense since it suggests an alternativeness relation between the properties *steep* and *long* of paths, rather than between *steep* and *short*. According to Lang (1977), coordination alternatives like the ones involved in *aber*-constructions

require a Common Integrator, that is, a relevant parallel between them.[6] For (12), such a relevant parallel would be that steep and long paths are both strenuous (Sæbø (2003)). This is more evident in (13) where instead of *kurz* its negated complement (antonym) *lang* is used and where the presupposition is easily verified:

(13)   Die Waldwege sind [steil]$_\alpha$, aber nicht [lang]$_T$.
        'The forest paths are steep but not long'.
        $\sigma \models \neg\phi[T(\phi)/\alpha]$ iff
        $\sigma \models \neg(\neg(\text{die Waldwege sind lang})[\text{lang/steil}]$ iff
        $\sigma \models \neg\neg(\text{die Waldwege sind steil})$

The derivation of the Common Integrator is a pragmatic process (generation of Relevance implicature) as a result of which the concessive interpretation of the contrast arises (Sæbø (2003)): the first conjunct supports the proposition that the paths are strenuous, whereas the second runs against it.

Sæbø argues further that the identification of the implicit topic involves a process of accommodating the information that along with a certain property or proposition goes another property or proposition.[7] This accommodation in turn triggers the Relevance implicature that leads to the concessive interpretation. I.e., the identification of the alternatives leads to the search for a Common Integrator.

As intuitive as the analysis of cases like (12) is, it does not become entirely clear how the implicit topic is identified. In particular, it is not clear what role the Relevance implicature plays in recovering the implicit topic. It seems that the two processes are intertwined, which creates the impression that accommodating the alternativeness relation is based on generating a Relevance implicature, which is somewhat problematic as it suggests that conversational implicatures are generated on the basis of a semantically incomplete sentence (since the contrast presupposition is not yet processed). Also, the notion of "topic" utilized by Sæbø remains rather vague as it does not correspond to the structural topic. According to Sæbø, topic is "the portion of the sentence for which the context supplies a substitute". On closer inspection, one could argue that "the portion of the sentence for which the context supplies a substitute" is information that is in some way already given, inferable or recoverable from the current discourse situation. Consider for instance the case of contrastive topics. Contrastive topics come with a parallel sentence structure and particular intonation (at least in German, called "hat contour") that evoke a set of alternative expressions. The mention of the topic of the first conjunct evokes a set of alternatives from which the topic of the *aber*-clause is recoverable and is in this sense given information. In cases like (13), the "portion of the sentence for which the context supplies a substitute" is in the scope of the negation, and

---

[6]Notice that the notion of "coordination alternatives" is different from the information-structural notion of topic or focus alternatives. There are cases involving *aber* where the two kinds of alternatives coincide, as in the cases involving contrastive topic like (9), where the coordination alternatives are also topic alternatives to each other. In other cases, like the forest-paths example, they don't. Here, the focus alternatives *steil* and *kurz* are not the coordination alternatives that are contrasted by means of the adversative construction.

[7]Or other ontological entities, as Sæbø shows.

negation is generally known to trigger the implicature that the opposite is normally the case (cf. e.g. Jacobs (1991)), hence the element in the scope of the negation is in a way given in the context.

Consequently, Sæbø's notion of topic seems to be better understood in the sense of information given by the "discourse topic" or "question under discussion". This view is also supported by Umbach's (Umbach (2005)) observation on the behaviour of *but*-conjunctions which always involve the confirmation and the denial of an explicit or implicit discourse topic called "Quaestio". This is what she calls the "denial condition" which *but* imposes on its context. Thus, the Quaestio for (13) would be:[8]

(14)   a.   Q: Sind die Waldwege steil? Und sind sie auch lang?
             'Are the forest paths steep? And are they long too?'
        b.   [**yes**] Die Waldwege sind steil, aber [**no**](sie sind) nicht lang.
             'The forest paths are steep but not long.'

Crucially, the Quaestio for (12) is the same:

(15)   a.   Q: Sind die Waldwege steil? Und sind sie auch lang?
             'Are the forest paths steep? And are they long too?'
        b.   [**yes**]Die Waldwege sind steil, aber [**no**](sie sind nicht lang, sie sind) kurz.
             'The forest paths are steep but short.'

In both cases, the *aber*-conjunct is a denial of the second part of the Quaestio. Thus it seems that Sæbø's implicit topic is given by Umbach's Quaestio and can be reconstructed on the basis of the denial condition: if the *aber*-connect does not contain contrastive topic or an explicit negation, the complement of the focus can be reconstructed as the implicit topic. Where negation is overt, as in (14-b), the material in the scope of the negation counts as the "topic", in the sense of material given by the implicit Quaestio. Thus taking Umbach's denial condition into consideration gives us a handle on the process of derivation of the implicit topic.

4 *Aber* in denials

As already mentioned, the contrast presupposition was meant to provide a full specification of the meaning of *aber*. However, Sæbø does not consider cases of *aber* used in denial sequences. In this section I will show that the contrast presupposition applies to these cases as well. Consider (16).

(16)   A: Peter [lügt]$_\alpha$ nicht.
        'Peter is not lying.'

---

[8]Notice that in (14-b), the focus is on *nicht*, not on *lang*, making *lang* the background, which supports a view on *lang* as given material in the sense of information given by the Quaestio.

B: Er [lügt]$_{VF}$ aber.
'But he IS lying.'

Here we have a case of explicit denial where one and the same material is successively negated and asserted. The verb in the *aber*-utterance carries verum focus which is also associated with old information (Höhle (1992)): it is already mentioned in the preceding utterance. The verum focus here can therefore be assumed to be the "topic" of the contrast presupposition, and the alternative is the same verb in the preceding utterance. Here, the presupposition reduces to the requirement that the context should entail the negation of the *aber*-sentence:

(17) $\sigma \models \neg\phi[T(\phi)/\alpha]$ iff
        $\sigma \models \neg(\text{Peter lügt})[\text{lügt}/\text{lügt}]$ iff
        $\sigma \models \neg(\text{Peter lügt})$

Thus correction can be viewed as a special case of Sæbø's contrast.[9]

In cases of implicit denials like (4-a), repeated below as (18), the analysis is similar to the cases where *aber* is a conjunction.

(18)   A: Peter [kommt mit ins Kino]$_\alpha$.
        'Peter is coming to the cinema.'
        B: Er ist aber [verreist]$_F$.
        'But he has left.'

Here, the "topic" is the complement of the focus, e.g. *ist in der Stadt*. The alternative is the focus of the preceding utterance, *kommt mit ins Kino*. The presupposition can be verified: we get that the context entails that Peter is coming along, which is indeed so.

(19) $\sigma \models \neg\phi[T(\phi)/\alpha]$ iff
        $\sigma \models \neg\neg$ (Peter ist in der Stadt) [ist in der Stadt/kommt mit ins Kino] iff
        $\sigma \models$ Peter kommt mit ins Kino

Summing up, the contrast presupposition seems to adequately grasp the meaning of *aber* in coordinative conjunctions as well as in denial sequences. Notice that the meaning of *aber* is in fact underspecified between different kinds of "topics" that are contrasted with different kinds of alternatives. The "topic" can be a contrastive topic, the complement of the focus, the element in the scope of the (focussed) negation, or verum focus. The alternative may or may not coincide with the "topic". What is also important is that the context for verifying the presupposition in the case of *aber* is always the preceding sentence or utterance, which is not always so in the case of *doch*, and it seems that accommodation of the presupposition is not possible.

---

[9]Cf. related observations in Umbach (2004) who argues that correction cases involve just like contrastive cases a denial excluding one of two alternatives.

5   Doch

The connector *doch* is more versatile than *aber* in its uses and interpretations. As a conjunction, it is synonymous with *aber* in coordinative constructions (although it does not share its positional flexibility)[10]: in other positions, *doch* gets a different interpretation. Consequently, the same analysis applies for the conjunction *doch* as for the use of *aber* as a coordinative conjunction. Also here the "topic" can be a contrastive topic (20-a), the complement of the focus (20-b) or the element in the scope of the focussed negation (20-c).

(20)   a.   Für [kleine]$_\alpha$ Betriebe hält sich der Schaden noch in Grenzen, $\left\{ \begin{array}{c} \text{aber} \\ \text{doch} \end{array} \right\}$ für [mittlere]$_T$ wird er allmählich ruinös.

   b.   Die Waldwege sind [steil]$_\alpha$, $\left\{ \begin{array}{c} \text{aber} \\ \text{doch} \end{array} \right\}$ [kurz]$_F$.

   c.   Die Waldwege sind [steil]$_\alpha$, $\left\{ \begin{array}{c} \text{aber} \\ \text{doch} \end{array} \right\}$ nicht [lang]$_T$.

The more interesting uses of *doch*, the ones that do not have *aber*-counterparts, are positioned in the middle field or the initial field or are sentence equivalents used as answers or as the second part in alternative questions (with the first part negated). In all these cases, *doch* gets a corrective interpretation.[11]

---

[10]*aber* has three possible positions: left adjoined to the middle field, right adjoined to the forefield or left of the forefield, cf. Sæbø (2003).

[11]There are some distributional issues here. In implicit denials, only unaccented MF-*doch* can be used:

(i)   A: Peter kommt mit.
   a.   B: Er ist doch VERREIST.
   b.   B: # Er ist DOCH verreist.

In explicit denials, accented *doch* is more appropriate. Unaccented *doch* is rather marginal (ii)b., dito immediately succeeding full-fledged sentence with accented *doch* (ii)c. instead of the sentence equivalent (ii)a. Accented MF-*doch* is more appropriate with intervening material, cf. (iii). An exception are cases like (iv) where the correction of A's statement is carried out by means of the negation and *doch* expresses a correction of previous belief. These distributional constraints must be of a pragmatic nature, e.g. economy reasons, since the uses of *doch* in the marginal cases are not fully out.

	A: Das stimmt nicht.	A: Das stimmt.
(ii)	a. B: DOCH.	B: # DOCH.
	b. B: Es STIMMT doch.	B: Es STIMMT doch nicht.
	c. B: Es stimmt DOCH.	B: Es stimmt DOCH nicht.

(iii) A_1: Es geht nicht.
   B_1: Du musst die Schraube drehen.
   A_2: Hast recht, es geht DOCH.

(iv)   A: Peter ist verreist.
   B: Er ist DOCH nicht verreist.

Finally, initial-field *doch* as in (6) is used as a clause connector and expresses denial of expectation, which can also be viewed as a case of a correction pertaining to default expectations.

I will look at these uses in turn.

5.1   Middle-field *doch*

In the middle field (MF), two prosodically different uses of *doch* have to be distinguished: accented and unaccented *doch*, both of which express correction. In coordination contexts, neither prosodic variant of MF-*doch* marks a relation of contrast between the two conjuncts but rather a causal relation. Consider (21).

(21)   a.   Peter kommt nicht mit. Er ist doch VERREIST.
            'Peter is not coming along. He has left, as you should know.'
       b.   Peter kommt nicht mit. Er ist DOCH verreist.
            'Peter is not coming along. He has left, after all.'

The crucial intuition is that compared to *aber*, both prosodic variants of MF-*doch* here signal a different kind of contrast that takes its antecedent from a more distant part of the discourse than the immediately preceding sentence, in contrast to *aber*, cf. (22) which is infelicitous since no reasonable contrast between being out of town and not coming along can be made sense of:

(22)   Peter kommt nicht mit. # Er ist aber verreist.
       'Peter is not coming along. But he has left.'

Intuitively, both kinds of MF-*doch* in (21) suggest that the complements of the propositions that the *doch*-sentences express (may) have been considered earlier. This possibility is however not licensed by the sentences preceding the *doch*-sentences but it is excluded by them (as the proposition that *Peter is not coming along* is consistent with the proposition *Peter has left town*). The *doch*-sentences represent rather corrections of, assumed or actual, previous contrary assumptions of the speaker, hearer or both.

The two prosodic variants of middle-field *doch* express however corrections of different sorts. I will take a closer look at the two MF-*doch*s next.

5.1.1   Unaccented MF-*doch*

The unaccented MF-*doch* indicates intuitively that the proposition expressed by the sentence belongs to the common knowledge of speaker and hearer.[12]   The correction

---

[12]This holds in general also for nondeclarative uses of this *doch*, as argued in Karagjosova (2004). I will only consider declarative uses here, assuming that the present analysis is compatible with the

pertains to the set of propositions that are assumed to be common knowledge. It is triggered by a manifested or hypothetical deviant opinion on the part of the interlocutor, as in (23), where A demonstrates lack of knowledge of the assumed common ground proposition *Peter is out of town*: from the assertion that Peter is going to the cinema speaker B can infer on the background of general world knowledge and assumptions of cooperativity that A does not know or is currently not aware of the fact that Peter is out of town since otherwise he would not have asserted (23)-A:

(23)   A: Peter kommt mit ins Kino.
          'Peter is coming to the cinema.'
          B: Er ist doch VERREIST.
          'But he has left (as you should know).'

The fact that this *doch* marks the proposition as given information suggests that the "topic" we are dealing with here can be identified with the entire sentence, e.g. that Peter has left in (23). The alternative is identical with the "topic", and its negation is suggested by the context. Indeed, the contrast presupposition can be verified in the context of utterance A: the sentence that Peter has not left can be reasonably assumed to follow from the sentence that Peter is coming along to the cinema.

(24) $\sigma \models \neg\phi[T(\phi)/\alpha]$ iff
          $\sigma \models \neg$ (Peter ist verreist) [Peter ist verreist/Peter ist verreist]
          $\sigma \models \neg$ (Peter ist verreist)

There are also cases where the context does not immediately provide a demonstration of a lack of assumed common knowledge with respect to the *doch*-proposition, i.e. where the presupposition cannot be verified by the preceding utterance or the more remote discourse context. There however accommodation is possible, giving rise to a "preventive" corrective reading of this *doch*, a hypothetical misconception that the speaker wants to rule out at the outset.[13]

5.1.2   Accented MF-*doch*

The accented MF-*doch* expresses, similarly to its unaccented counterpart, that the opposite of what is asserted by the *doch*-utterance was considered earlier. However, in the case of this *doch* the correction does not necessarily pertain to the common knowledge of the interlocutors. It may be used in cases where the interlocutor, both or the speaker himself held the opposite belief at some earlier point in time, i.e. it can express also self-correction. Consider (25).

---

nondeclarative ones as well.
[13]A similar function is fulfilled by the sentence equivalent *doch* used in confirmations, as argued in Karagjosova (2006).

(25) A_1: Es geht nicht.
         'It does not work.'
         B_1: Du musst die Schraube drehen.
         'You have to turn the screw.'
         A_2: Hast recht, es geht DOCH.
         'You are right, it works after all.'

In (25)-A_2 it is reasonable to assume a "topic" that can be reconstructed as the complement of the focus. The focus here is *doch* itself, and a sensible candidate for the complement of focussed *doch* is the sentential negation *nicht*.[14] The alternative coincides with the topic and the presupposition can be verified, albeit not in the context of the immediately preceding utterance, but in the wider discourse context, here A_1:

(26) $\sigma \models \neg\neg$(es geht nicht)[nicht/nicht] iff
         $\sigma \models$ es geht nicht

In parallel to its unaccented counterpart, accented MF-*doch* may be used in a context that does not immediately verify the contrast presupposition. There however the presupposition can easily be accommodated. In such cases we deal with corrections whose corrigendum was not verbalised.

5.2   The sentence equivalent *doch* and conjunct adverb *doch*

The remaining uses of *doch* fit into the analysis of accented middle-field *doch*. The sentence equivalent *doch*, as in (7) and (8), is accented and expresses correction: the "topic" of the contrast presupposition is the complement of focussed *doch*, i.e. the sentential negation, and coincides with the alternative. The preceding utterance provides the alternative and verifies the presupposition. In the case of the conjunct adverb *doch*, as in (6), which is positioned in the initial field of the sentence and is also accented, the contrast presupposition is also reduced to the requirement that the context entails the negated counterpart of the *doch*-clause. The difference to middle-field *doch* is that conjunct adverb *doch* functions as a clausal connector which requires that the first conjunct provides the alternative and the context for verifying the presupposition. This requirement leads to the concessive (denial of expectation) interpretation of this *doch*, as argued in Karagjosova (to appear).

5.3   The basic meaning of *doch*

Summing up, the contrast presupposition seems to be applicable to all uses of *doch* as well as to *aber*. This meaning is underspecified as well, as we have different kinds of "topics" contrasted with different kinds of alternatives. The "topic" can be again a

---

[14]Semantically, *doch* is an assertion operator, it asserts the sentence in its scope without influencing its truth conditions. The complement of the assertion operator is the negation operator.

contrastive topic, the complement of the focus, the element in the scope of the focussed negation[15] and the alternative may or may not coinside with the "topic". In contrast to *aber*, the context for verification may be more remote, and there are cases where the presupposition can be accommodated.[16]

6   Contrast and underspecification

Now we can go back to the questions raised in section 2. So far, we have seen that the contrast presupposition defined by Sæbø generalises over all uses of *aber* and *doch* and can be assumed as the basic meaning of these adversative connectors. We also saw that the meaning of *aber* and *doch* is underspecified, as we deal with different "topics" that are opposed to different alternatives depending on how the connector is used.

The various interpretations of the connectors can be seen as a function of different instantiations of the contextual parameters "topic" and "alternative", which in turn correlates with syntactic and prosodic properties of the particles such as syntactic position and accent, as well as with the discourse configuration at hand (coordination or denial). In other words, the difference between *aber* and *doch* and among their variants is a matter of association of different kinds of "topics" with different alternatives in different contexts, which render various kinds of contrasts.

Table 1 shows the contextual parameters defining both the different syntactic, prosodic and discourse-structural uses of *aber* and *doch* and their interpretations.[17] For instance, *aber* in a coordinative construction 'C_{i-1} *aber* C_i' contrasts the contrastive topic (CT), the complement of the focus ($\overline{F}$) or the element in the scope of the focussed negation (neg-T) in the *aber*-sentence with some alternative that is provided by the first conjunct C_{i-1}. This alternative is different from the topic ($\alpha \neq T(\phi)$) and is either the contrastive topic or the focus of the first conjunct respectively. The context for verifying the contrast presupposition is the first conjunct ($\sigma = C_{i-1}$).[18] The same holds for the conjunction *doch*. The interpretation of these variants of *aber* and *doch* is that of semantic opposition, and cases of concession are pragmatically derived as shown in Sæbø (2003). In explicit denials, the "topic" is the verum focus, the alternative coincides with it and is provided by the immediately preceding utterance U_{i-1}, and the context for verification of the presupposition is the immediately preceding utterance. The interpretation is that of correction. In the case of MF-*doch* in coordination contexts, the "topic" is either the entire sentence (unaccented *doch*) or the complement of the focus (accented *doch*); the alternative coincides with the "topic" and is not provided by the first conjunct ($\sigma - C_{i-1}$). The context in which the presupposition can be verified does not include the first conjunct. These *doch*-variants get a correction interpretation.[19]

---

[15]Or verum focus, as in (ii)a-c.

[16]The last two facts are probably related, as accommodation is not possible only in the cases where *doch* functions as conjunction and conjunct adverb and the context for verification is the first conjunct.

[17]Here, neg-T(ϕ) is the element in the scope of the negation in cases like (13).

[18]Here, I only deal with the case where α is of a propositional type. It can be of other types, as shown in Sæbø (2003), such as individuals, times, locations etc.

[19]In the case of initial-field *doch*, we have also a kind of correction, insofar as denial of expectation

Table 1: The contextual parameters

	coordination	explicit denial	implicit denial
aber ϕ	$T(\phi) = CT(\phi)$ or $\overline{F}(\phi)$ or neg-T(ϕ)	$T(\phi) = VF(\phi)$	$T(\phi) = \overline{F}(\phi)$ or neg-T(ϕ)
	$C_{i-1} \models \alpha^*$	$U_{i-1} \models \alpha$	$U_{i-1} \models \alpha$
	$\alpha \neq T(\phi)$	$\alpha = T(\phi)$	$\alpha \neq T(\phi)$
	$\alpha = CT(C_{i-1})$ or $F(C_{i-1})$		$\alpha = F(U_{i-1})$
	$C_{i-1} = \sigma$	$U_{i-1} = \sigma$	$U_{i-1} = \sigma$
ψ *doch* ϕ	$-"-$		
MF-*doch* ϕ	$T(\phi) = \phi$		$T(\phi) = \phi$
	$C_{i-1} \not\models \alpha$		$U_{i-1} \models \alpha$
	$\alpha = T(\phi)$		$\alpha = T(\phi)$
	$\sigma - C_{i-1}$		$U_{i-1} = \sigma$
MF-DOCH ϕ	$T(\phi) = \overline{F}(\phi)$	$T(\phi) = \overline{F}(\phi)$	
	$C_{i-1} \not\models \alpha$	$U_{i-1} \models \alpha$	
	$\alpha = T(\phi)$	$\alpha = T(\phi)$	
	$\sigma - C_{i-1}$	$U_{i-1} = \sigma$	
SE-DOCH		$-"-$	
IF-DOCH	$T(\phi) = \overline{F}(\phi)$		
	$C_{i-1} \models \alpha$		
	$\alpha = T(\phi)$		
	$C_{i-1} = \sigma$		

An adequate representation of the meaning of *aber* and *doch* should reflect these different configurations in my view, as they seem to systematically correlate with the different interpretations of the connectors. A further motivation for a more fine-grained representation is the fact that *aber* and *doch* are not completely synonymous, since *aber* has not parallel uses specialized for expressing common knowledge or concession the way *doch* does, and MF-*doch* does not have the same interpretation as MF-*aber*. In order to be able to differentiate between *aber* and *doch* on the lexical level, a different format is needed for specifying the basic meaning of the two connectors.

One possibility to do this is in terms of lexical underspecification, more closely by representing the ambiguity of *aber* and *doch* in terms of underspecified alternations in UDRT (Reyle et al. (2005)), i.e. sequences of alternative DRSs. The underspecified lexcial entry for *aber* will look like this:

Here, π is a label representing a clause as in SDRT (Asher and Lascarides (2003)). The definition says that *aber* triggers the presupposition that there is a sentence π' in the

can be viewed as correcting a default inference by assuming its opposite.

discourse context such that π' is the negation of the result of replacing the different "topics" of π by the respective alternatives. The entry for *doch* will have the two additional alternations in (27) capturing the two cases of middle-field *doch*. The entry for the unaccented MF-*doch* reflects its additional common knowledge component, namely that the speaker believes the sentence to be given information:

(27) $\boxed{\begin{array}{l} \pi' : \neg\pi[\pi/\pi] \\ B_S\,GIVEN(\pi) \end{array}}$ $\vee!$ $\boxed{\pi' : \neg\pi[\overline{F}(\pi)/\overline{F}(\pi)]}$

In order to arrive from this representation to a particular contrast interpretation, additional information has to be considered, namely the contextual parameters position, accent and discourse structure. This information specifies the particular uses and interpretations of *aber* and *doch*. Here I can only hint at what formal ingredients are needed to build up a semantic representation of discourses with *aber* and *doch*. First of all, the representation of the clauses must include information about their information structure: contrastive topics, focus, verum focus, and background. Recent developments in DRT such as Kamp (2004) provide means for representing the information structure of sentences in discourse, at least with respect to focus and background. And second, the discourse representation must contain information about the discourse structure, i.e. whether we deal with coordination or implicit/explicit denials. This information could be partly provided by SDRT glue logic axioms used to identify the rhetorical relation between two clauses in discourse (Asher and Lascarides (2003)). For the disambiguation of the different positional and prosodic variants which is specifically relevant for *doch*, DRT construction rules can be specified that will guide the construction of the semantic representation from the syntactic form and the focus-background articulation of the clauses, much in the way proposed in Riester (2005) where the compositional semantic system of Bottom-Up DRT (Kamp et al. (2004)) is augmented by semantic-syntactic constraints by means of which syntactic constituents are marked as being part of the focus or the background of the sentence. Thus disambiguation will be guided by the construction rules, as well as by information contained in the partially built (S)DRS about the discourse structure and the information structure of the conjuncts.

7   Conclusion

In this paper, I proposed an unifying account of the two major German adversative connectors *aber* and *doch* based on a generalisation of Sæbø's contrast presupposition over various contextual parameters involving information structure, discourse structure and the syntactic position and prosody of the connectors. I suggested that an underspecified representation of the meaning of these connectors, complemented by a procedure for selecting the adequate reading in the particular context, accounts for the similarities and differences in the various interpretations of these polyfunctional words. The details of the suggested disambiguation algorithm are being worked out in ongoing research.

References

Asher, Nicholas and Alex Lascarides (2003), *Logics of Conversation*, Cambridge University Press.

Grote, Brigitte, Nils Lenke and Manfred Stede (1997) "Ma(r)king concessions in English and German", in *Discourse Processes*, **1**(24), 87–118.

Höhle, Tilman N. (1992) "Über Verum-Fokus im Deutschen", in J. Jacobs (ed.) *Informationsstruktur und Grammatik*, Linguistische Berichte, Sonderheft 4/1991-92, Westdeutscher Verlag, Opladen.

Jacobs, Joachim (1991) "Negation", in A. von Stechow and D. Wunderlich (eds.) *Handbuch der Semantik*, Königstein: Athinäum.

Kamp, Hans (2004) "Information structure in a dynamic theory of meaning", in *Proceedings of the LSK Conference*, Seoul.

Kamp, Hans, Joseph van Genabith and Uwe Reyle (2004), "Discourse Representation Theory", in D. Gabbay and F. Gnthner (eds.) *Handbook of Philosophical Logic*, 2nd edn, Vol. 13, Kluwer.

Karagjosova, Elena (2004) *The Meaning and Function of German Modal Particles*, Saarabrcken Dissertations in Computational Linguistics and Language Technology.

Karagjosova, Elena (2006) "The German response particle *doch* as a case of contrastive focus", in *Proceedings of The Ninth Symposium on Logic and Language*, Besenyotelek, Hungary.

Karagjosova, Elena (to appear) "Conjunct adverb *doch* and the notion of contrast", in *Linguistics*.

Lang, Ewald (1977) *Semantik der koordinativen Verknüpfungen*, Berlin: Akademie-Verlag.

Reyle, Uwe, Antje Rossdeutscher and Hans Kamp (2005) "Ups and Downs in the Theory of Temporal Reference", in *Linguistics and Philosophy* (submitted).

Riester, Arndt (2005) "Context and focus projection. A compositional, intonation-based account of focus interpretation", in Emar Maier, Corien Bary and Janneke Huitink (eds.) *Proceedings of SuB9*, Nijmegen, 299–313.

Sæbø, Kjell Johan (2003) "Presupposition and contrast: German aber as a topic particle", in Weisgerber (ed.) *Proceedings of SuB7*, Konstanz.

Umbach, Carla (2005) "Contrast and Information Structure: A focus-based analysis of but", in *Linguistics*, **43**(1).

Umbach, Carla (2004) "On the Notion of Contrast in Information Structure and Discourse Structure", in *Journal of Semantics*, **21**(2), 1–21.