

Sophie Repp\* (Berlin)

## When the Negative Goes Missing: The Role of the Information Structure in Gapping Coordinations with *but*

### 1 Introduction

Gapping is an ellipsis type which in English and German as well as in other head-initial or mixed head-final/head-initial languages elides the finite verb in the second conjunct of a clausal coordination<sup>1</sup>:

- (1) Carl stroked the cat and Dean ~~stroked~~ the dog.

Along with the verb, other material such as direct or indirect objects can be omitted as well:

- (2) Carl gave the cat a treat and Dean ~~gave~~ the dog ~~a treat~~.

This also extends to clausal negation<sup>2</sup>:

- (3) Carl didn't stroke the cat and Dean ~~didn't stroke~~ the dog.

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<sup>1</sup> In head-final languages such as Japanese or Korean, Gapping elides the finite verb in the first conjunct.

<sup>2</sup> This generalisation is language-dependent. English is more tolerant than German for instance, although the judgements for English vary to some extent. Ross (1970: 250) marks the following as ungrammatical:

(i) \*I didn't eat fish, Bill rice, and Harry roast beef.

Similarly, Jackendoff (1971: ex. 14) and Sag (1976: 143) find gapping with negation problematic. Other authors, like Siegel (1984, 1987), Oehrle (1987) and Johnson (1996/2003) judge it to be good. The data I collected on these structures confirmed the latter judgement. German gapping usually does not tolerate the elision of the negation. In structures like (3), the negative marker needs to be repeated in the second conjunct:

(ii) Karl hat die Katze nicht gestreichelt, und Hans nicht den Hund.

'Karl did not stroke the cat and Hans didn't stroke the dog.'

In Repp (2005), I argued that the cross-linguistic difference is due to the different categorial status of the negative marker in the two languages (head in English vs. adjunct in German). Also see section 3.

The material in the second conjunct is interpreted just as if it were there. This is what we normally expect in ellipsis. Nevertheless, there are factors that can interfere with this. One such factor is the occurrence of the conjunction *but* in the second conjunct, which leads to a positive interpretation of that conjunct:

- (4) The cat wasn't stroked by Carl but the dog by Dean.  
= The dog was stroked by Dean.

This holds both for an interpretation of what I shall call here contrastive *but* and of the *but* used in corrections, as is illustrated in the next two examples for German. German distinguishes the difference between contrastive coordinations and corrections lexically: the conjunction *aber* is used in contrastive coordinations, *sondern* is used in corrections.

- (5) *Contrastive coordination*  
Karl hat die Katze nicht gestreichelt, aber Hans den Hund.  
'Karl did not stroke the cat but Hans, in contrast, did stroke the dog.'
- (6) *Corrective coordination*  
Karl hat nicht die Katze gestreichelt, sondern Hans den Hund.  
'It is not the case that Karl stroked the cat: Hans stroked the dog.'

The English case in (4) is preferably read as a contrastive coordination, although a corrective interpretation is not excluded. An alternative to express the desired correction would be to use an asyndetic coordination of two full clauses:

- (7) The cat wasn't stroked by Carl: The dog was stroked by Dean.

Corrections will not be investigated in this paper. In a corrective coordination, the first conjunct removes material from the common ground and the second conjunct provides an appropriate substitute.<sup>3</sup> Building on this observation, it has been proposed that the negation in corrections is part of a complex operator *not-but* (e.g. Horn 1989; Lang 1984; McCawley 1991). From this point of view, it is not really surprising that the negation should 'disappear' in the second conjunct.

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<sup>3</sup> What is to be removed from the common ground is indicated by focus, which – roughly – has to occur in the c-command domain of the negation (the Spec,CP position is exempted from this). The second conjunct provides an alternative to the focus. The focussed phrases in (6) are the subject *Karl* and the object *die Katze* (which is marked by pitch accents, not indicated in the example). The negative marker must occur before the object in order to c-command it. Since the subject is situated in Spec,CP it is not subject to this condition. In the contrastive coordination in (5), no focus-related restrictions on the relative position of the negative marker obtain. The word order of the first conjunct is that of a wide-focus sentence.

For contrastive *but*, things are not quite so straightforward. Lang (1991) suggests that German *aber* creates a scope boundary for the negation and other propositional operators in the sense that the conjunction prevents the operators from extending their scope to the second conjunct. It is unclear, however, why that should be. Contrastive *but* / *aber* need not combine with a negation as does corrective *but* / *sondern*.<sup>4</sup> Still, in the ellipsis, the negation is not recovered in the elliptic conjunct if that is introduced by contrastive *but*. The aim of the present paper is to find the reason for this phenomenon. The proposal offered builds on two recent accounts of contrastive *but* which make the conjunction out to be sensitive to the information structure of the clause, viz. Umbach (2001, 2005) and Sæbø (2003). In these accounts, it is argued that contrastive *but* associates with contrastive topics. Importantly, contrastive topics are usually thought to come with corresponding foci (e.g. Büring 1997, 2003; and others). A closer inspection of the gapping structures shows that in these structures, contrastive *but* associates with a contrastive topic in the first conjunct whose corresponding focus is the clause's negative polarity. The second conjunct then provides the alternatives for topic and focus, which results in the second conjunct being positive. The paper is structured as follows. In section 2, I shall look at the information-structural sensitivity of contrastive *but* as it is investigated in Umbach (2001, 2005) and Sæbø (2003). I shall add some further evidence using non-elliptic data that support this idea. In section 3, I shall examine the intonational make-up of gapping sentences with *and* vs. contrastive *but* and show that the information structure in the two cases differs. I shall analyse the data in the framework for contrastive topics and foci proposed by Büring (2003). Section 4 concludes.

The data set is restricted to German *aber*. English *but* will not be investigated here. The reason for this is that *but* is not good in most cases of gapping. When confronted with a gapping sentence that contains contrastive *but*, speakers of English often report that there is "not enough contrast" that would warrant the use of the conjunction, i.e. it is pragmatically odd. Interestingly, while simple transitive structures are quite bad (see (8) below), coordinations containing adjuncts as in (4) above, for instance, are better. The reasons for these differences are quite unclear.

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<sup>4</sup> There are other conjunctions apart from corrective *but* which produce a positive reading of the second conjunct in gapping and which seem to require a negation in the first but not in the second conjunct independently of whether there is ellipsis or not. Van der Heijden (1999: 127) gives the Dutch example in (i) Similar cases can be found in English and German (see (ii) and (ii)). (iv) shows the non-elided version of (iii).

- (i) Johan heeft Karin niet meer opgebeld, laat staan Karin Johan.
- (ii) John didn't call Karin any more, let alone Karin John.
- (iii) Johannes hat Karin nicht mehr angerufen, geschweige denn Karin Johannes.
- (iv) Johannes hat Karin nicht mehr angerufen, geschweige denn dass Karin Johannes (\*nicht) angerufen hat.

These conjunctions have a clear negative meaning, something like 'not considering'. How they work exactly must remain unexplored here.

(8) #John ate rice but Jim potatoes.

For speakers who accept pseudogapping, this ellipsis type is much more acceptable to express the meaning intended in (8):

(9) John ate rice but Jim did potatoes.

It seems that the two ellipsis types display different kinds of contrast. Hoeksema (2005) conducted a corpus study of gapping and pseudogapping in English and found that pseudogapping combines more often with *but* than with *and* whereas for gapping it is the other way round. I shall not explore this topic any further here.

## 2 *Aber* is Sensitive to the Information Structure of the Clause

### 2.1 The Meaning of *aber*

The meaning of *aber*/contrastive *but* has been of interest in the philosophical and linguistic literature at least since Frege (1879). The difficulties in defining its semantics lie in its extremely flexible use, which seems to call either for a long list of alternative definitions, or for a very minimal definition with specific restrictions that apply in particular environments. As a first approximation, it is often assumed that *but* signals contrast between two states-of-affairs and that the state-of-affairs denoted by the second conjunct somehow denies or negates conclusions that (might) have been drawn from the meaning of the first conjunct. Schematically, this reads as follows:

(10)  $p$  but  $q$  corresponds to  $p$  and therefore (probably)  $\neg q$ , but actually  $q$ .

Applying this to an example, we get the following:

(11) The girl is short but good at basketball.

The first conjunct in (11) suggests that the girl should be bad at basketball – considering that she is short –, and the second conjunct says that this expectation is not borne out: the girl is good at basketball.

The formula in (10) has been argued to be a special case of a more general formula which expresses the relation between the two conjuncts in a more indirect way (e.g. Anscombe & Ducrot 1977; also see Ducrot 1973; Lang 1991; Merin 1996; Tobler 1899). The idea is that there is a third proposition in the

background which is important for the interpretation of the coordination. Anscombe & Ducrot (1977), who couch their definition of *but* in an argumentation theoretical framework (Ducrot 1973), specify this as follows: the first sentence in a coordination with contrastive *but* is an argument for some conclusion, the second sentence is an argument against it. The second sentence is taken to be of greater argumentative value than the first, so that the case against the conclusion is stronger than the case for it, cf. (12).

(12) The child is quick enough but he's too clumsy.

In (12), the conclusion under discussion might have been whether the child should be trusted with some urgent and delicate job. The first conjunct is an argument for this conclusion, the second is an argument against it. As a consequence, the coordination as a whole is taken to reject the conclusion.

Several other ways of how the two conjuncts relate to the third proposition in the background have been conceived. Merin (1996), for instance, proposes that stochastic relevance is particularly fruitful: the first conjunct increases the likelihood of the background hypothesis, the second conjunct decreases that likelihood or vice versa. In other words, the two conjuncts are inversely relevant for the background proposition. I cannot discuss the details of this issue here but shall assume that a background hypothesis is indeed relevant for the interpretation of coordinations with *but*. For more discussion, also of alternative accounts, the interested reader is referred to the literature (see for instance Asher 1993; Bach 1999; Blakemore 1987, 2000; Gaerdenfors 1994; Koenig & Benndorf 1998; Lakoff 1971; Lang 1991, 2001, 2003, 2004; Lang & Adamíkova to appear; Lang & Umbach 2003; Malchukov 2004; Mann & Thompson 1988; Oversteegen 1997; Rieber 1997; Winter & Rimon 1994; for an overview of the literature up to the late 1980s see Rudolph 1996).

One characteristic of contrastive *but* that plays a role in only few of the accounts just mentioned and which only recently has received increased attention is that the conjunction seems to be sensitive to the information structure of the clause. Sæbø (2003) and Umbach (2001, 2005) argue that *but* associates with contrastive topics. Lang (2002; 2004), Adamíkova (2004) and Lang & Adamíkova (2005) also discuss the information-structure of coordinations with *aber* in great detail. They do not go as far, however, as to assume that *aber* actually 'associates' with topics. Their emphasis lies on the particular role of the intonation in connection with various readings of *aber/sondern*-coordinations (see below, section 3.2), as well as the role of the discourse context for the information structure of coordinations with *but*. We shall see that the issues of intonation and information structure also are vital for the gapping data. In the next subsections we shall explore the proposal that *but* associates with contrastive topics. In section 3, we shall turn to German gapping sentences with *aber* and investigate their intonational and information-structural make-up.

## 2.2 *Aber*, Contrastive Topics and Foci

Consider the following dialogue from Umbach (2005: 208):

- (13) Adam: What did the small children do today?  
Ben:  
a. The BIGGER children stayed at home {but/ ??and} the SMALLER children went to the zoo.  
b. The SMALLER children stayed at home {but/ ??and} the BIGGER children went to the zoo.

The example shows that although Adam's question is about *the smaller children*, it is possible for Ben to add a statement about *the bigger children* – provided he uses the conjunction *but*. *And* cannot be used in this context. On the basis of data like these, Umbach (2001, 2005) suggests that contrastive *but* can introduce a new, additional topic, viz. *the bigger children* in (13), where 'topic' is meant in the aboutness sense with the additional requirement that it be contrastive, i.e. that it elicit alternatives like a focus. The alternative to *the bigger children* in (13) is *the smaller children*.<sup>5</sup>

Sæbø (2003) puts forward the following argument for the relevance of information structure, in particular the notion of topic, to the analysis of *but*. In German, *aber* can take various positions in the clause. Sæbø suggests that the conjunction, if placed after the constituent in the forefield (Spec,CP), demarcates that constituent as a topic for which the context should provide an alternative, that is, the constituent in Spec,CP should be a contrastive topic. An additional condition is that replacing the topic with its alternatives must result in a proposition that is contradicted by the context. This is basically Sæbø's semantics of *but* and we shall have a closer look at it in the next section. Let us illustrate Sæbø's point with an example (Sæbø 2003: 262):

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<sup>5</sup> Another argument for the information-structural sensitivity of *but* that is used by Umbach unfortunately is not so clear and in my view does not demonstrate what it is suggested to do. Umbach argues that the interaction of *but* with focus alternatives makes us expect different contrasts under the two accent patterns in (i) and (ii).

(i) ...but Bill has washed the DISHES. (Umbach 2005: 214)

(ii) ...but BILL has washed the dishes.

In (i), we expect a contrast between the accented object DP *the dishes*, or the whole VP *wash the dishes*, whereas in (ii), we expect a contrast with the accented subject DP *Bill*. However, this effect simply follows from current theories of focus if contrast is understood as the contrast between the focus and its evoked alternatives (which also is in the spirit of Umbach's theory). The effect does not have anything to do with the import of the conjunction *but*, which can be easily verified if *but* is replaced by *and* in the above examples: the effects are the same. In a footnote, Umbach says that *and* might be considered focus-sensitive, too, but concedes that this would lead to a considerable weakening of the notion of focus-sensitivity.

- (14) Die Frauen machen 66% der Beschäftigten im öffentlichen Sektor aus.
- a. Die Chefstellungen aber haben die Männer für sich reserviert.
  - b. ?Die Männer aber haben die Chefstellungen für sich reserviert.
- 'Women constitute 66% of the workforce in the public sector, (a) but the top positions are occupied by men. / (b) but men occupy the top positions.'

Sæbø argues that in (14)(a), the first clause provides an alternative to the topic constituent *die Chefstellungen* in the second clause, viz. 66% of the workforce in the public sector. In addition, the first clause – serving as the context – contradicts the result of substituting the topic *die Chefstellungen* with its alternative: it is not the case that men form 66% of the workforce in the public sector. In (14)(b), on the other hand, the first clause, although providing an alternative to the contrastive topic *die Männer*, viz. *die Frauen*, does not contradict the result of substituting the contrastive topic with its alternative: the first clause does not give us any information about women in leading positions.

There is additional evidence for the idea that a constituent in the Spec,CP position followed by *aber* must be a contrastive aboutness topics. We can test the topichood of the constituent before *aber* by construing the sequence *DP aber* as a weak pronoun left dislocation, where according to Frey (2004) the DP must be an aboutness topic ((15)(a)), or alternatively, as a hanging topic left dislocation, where the DP need not be an aboutness topic ((15)(b)).

- (15) a. Meine Schwester aber, die hat mit dem Nachbarsjungen gespielt.  
'But my sister – she played with the neighbour.'
- b. ??Meine Schwester aber, laut Max wird sie erst morgen kommen.  
'But my sister, according to Max, she will only come tomorrow.'

In weak pronoun left dislocation, a resumptive weak d-pronoun (*die*) occurs before the finite verb. In a hanging topic left dislocation, a resumptive pronoun (or some other resuming expression) can occur lower down in the structure. The fact that a dislocated DP (*meine Schwester* in (15)) followed by *aber* is fine in weak pronoun left dislocation ((15)(a)) whereas in hanging topic left dislocation, it is not ((15)(b)), indicates that the element preceding *aber* must be a topic.

In addition, consider that, according to Shaer & Frey (2004), the dislocated element in weak pronoun left dislocation must serve as a 'link' to previous discourse. This is reflected, for instance, in the restriction that weak pronoun left dislocation may not occur discourse-initially (see (16)(a)). This restriction does not hold for hanging topic left dislocation (see (16)(b)).

- (16) *Pointing to a sanctimonious politician on a television programme:*
- a. #Diesen Blödmann, den hat man kürzlich mit einer Prostituierten erwischt.  
'That jack-ass, I heard they caught with a prostitute.'
  - b. Dieser Blödmann, man hat ihn kürzlich mit einer Prostituierten erwischt.  
'That jack-ass, I heard they caught him with a prostitute.'

This characteristic of weak pronoun left dislocation to serve as a link to previous discourse agrees well with the characteristic of *but/aber* to associate with contrastive topics, which need a 'companion' contrastive topic in previous discourse. Thus, the possibility to use a phrase followed by the conjunction *aber* as the left-peripheral element in a weak pronoun left dislocation but not as a hanging topic left dislocation, supports the assumption that the conjunction if placed directly after a phrase in Spec,CP, marks the topichood of that phrase.

Nevertheless, there are data that seem problematic for the topic analysis. As Hans-Martin Gärtner (p.c.) points out, *wh*-interrogatives can occur in Spec,CP before the conjunction *aber* even though they are generally considered bad topics:

- (17) Wer aber ist gekommen?  
'But who came / did come?'

This indicates that the element before *aber* in Spec,CP does not have to be a topic. Note, however, that in (17), neither the *wh*-interrogative nor *aber* may be accented. Rather, either the auxiliary *ist* or the participle *gekommen* carry an accent:

- (18) a. \*WER aber ist gekommen?  
b. \*Wer ABER ist gekommen?  
c. Wer aber IST gekommen?  
d. Wer aber ist geKOMmen?

The effect of the obligatory accent on the auxiliary ((18)(c)) is a narrow focus on the (positive) polarity of the clause. The accent on the participle ((18)(d)) produces a narrow focus on the predicate. As a result, the *wh*-phrase ends up in the background to this focus and the question strongly suggests that it is known to hearer and speaker that somebody else – another *wer* ('who') – did not come (in the (c)-case) or did something different from coming (in the (d)-case), which, as we shall see, is a situation typical of contrastive topics. The same example without the conjunction *aber* does not have these restrictions.

Finally, consider that elements which cannot be accented, such as inherently weak *es*, are not allowed before *aber* in Spec,CP, which indicates that this position must be reserved for foci or topics:

- (19) a. Das MÄDchen aber hat auf dem Hof gespielt.  
 b. SIE aber hat auf dem Hof gespielt.  
 c. \*Es aber hat auf dem Hof gespielt  
 'But {the girl / she/ \*it} played in the courtyard.

In sum, we can be quite sure that *aber* if placed after a constituent in Spec,CP marks that constituent as a (contrastive) topic.

As an aside, note that demarcating a contrastive topic in Spec,CP is not all that *aber* can do in the German clause. As (20)(b) through (d) illustrate, *aber* can also take other positions in the clause. The effect again is a change of the information structure, this time, a division of the clause into background and focus. Thus, the material occurring before *aber* is background information, the material occurring after *aber* is focus:<sup>6</sup>

- (20) a. Meine Schwester hat am Morgen mit dem Nachbarsjungen auf dem Hof gespielt.  
 'In the morning, my sister played with the boy from next door in the courtyard.'  
 b. Meine Schwester hat *aber* am Morgen mit dem Nachbarsjungen auf dem Hof gespielt.  
 c. Meine Schwester hat am Morgen *aber* mit dem Nachbarsjungen auf dem Hof gespielt.  
 d. Meine Schwester hat am Morgen mit dem Nachbarsjungen *aber* auf dem Hof gespielt.

Modal particles like *ja* in German have the same partitioning effect (see Lenerz 1993). One of the consequences of this is that it is impossible to place a weak personal pronoun after a modal particle (Haider & Rosengren 1998, Lenerz 1993, 1994). (21) shows that this is exactly the same in the context of *aber*:

- (21) a. Meine Schwester hat mir {ja /aber} gestern ein Buch gegeben.  
 b. \*Meine Schwester hat {ja / aber} mir gestern ein Buch gegeben.  
 '(But) my sister gave me a book yesterday.'

The conjunction behaves exactly like the modal particle in this respect: (21)(b) is grammatical only if the personal pronoun is heavily accented, which would indicate narrow focus on the pronoun.

To sum up, *aber*/contrastive *but* is sensitive to the information structure of the clause it occurs in. On the one hand, it takes part in the information structuring of the clause by demarcating topic and focus positions. On the other

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<sup>6</sup> The same seems to hold of the Slovak adversative connectors *však* and (to some extent) *ale* cf. Adamíková (2004).

hand, it associates with contrastive topics, which have (explicit or implicit) alternatives in the preceding discourse.

### 2.3. Accounting for the Information-Structural Sensitivity

How do Sæbø (2003) and Umbach (2001, 2005) account for the information-structural sensitivity of *but*? Umbach suggests that *but* associates with a focus (or a contrastive topic) in the second conjunct of a coordination. This focus is the so-called expected alternative, which has a sister alternative in the first conjunct. The two foci contain each other in their respective alternative sets. There is then a denial condition, which is very similar to Sæbø's condition on contradiction, and which says that the proposition that results from substituting the expected alternative for the sister alternative is false. Consider the following example:

(22) John [cleaned up the ROOM]<sub>FOC</sub> but he didn't [wash the DISHES]<sub>FOC</sub>. (Umbach 2005: 218)

The expected alternative corresponds to the predicate of the second conjunct. The sister alternative is the predicate of the first conjunct. Substituting the expected alternative for the sister alternative results in a false proposition: substituting *wash the dishes* with *clean up the room* produces *John washed the dishes*, which is the opposite of what the second conjunct asserts.

The denial condition is combined with a condition on a quaestio – roughly, a backward-looking question under discussion, which is reconstructed from the information structure of the actual utterance. Umbach (2005) considers the quaestio "a diagnostic tool displaying the contextual conditions for the utterance to be felicitous" (p. 211). In the case of *but*-coordinations, the quaestio is assumed to be a two-part question (e.g. *Did John clear up the room and did he wash the dishes?*). The first conjunct is supposed to answer the first part of the quaestio in the positive ((*Yes*), *John cleared up the room*), the second conjunct answers the second part of the quaestio in the negative ((*No*), *he didn't wash the dishes*). Thus, there is a confirm+denial condition, in the sense that the first conjunct confirms (part of) the quaestio whereas the second denies (part of) it. This aspect is quite similar to what we heard about the role of a third proposition in the background in earlier accounts. Umbach's proposal is slightly different in that it uses a question as the anchor point, rather than a proposition. Also, the fact that the question consists of two parts, which have to be answered separately by the two conjuncts, distinguishes this account from those that rely on only one background proposition. To ensure coherence of the conjuncts within the coordination and of the coordination with the context, Umbach suggests that the quaestio interacts with an additional, forward-looking question. Yet this, it seems, results in a rather complicated view of dis-

course structuring. Note that in the above example it is possible to make do with a single polarity question as well, e.g. *Did John do the housework?*. The first conjunct answers this question in the positive and the second answers it in the negative. I shall not go into further details here.

Sæbø's (2003) theory is very similar to Umbach's but does without a contextual question or proposition. It relies fully on the establishment of alternatives. As we saw before (see the discussion around example (14)), the idea (again) is that the first conjunct of a coordination with *aber* (= the context) provides an alternative to a topic constituent in the second conjunct of the coordination and presupposes that alternative and topic cannot be exchanged.<sup>7</sup> Sæbø emphasises that "what is denied is not a context clause or an inference thereof, but some part of context clause combined with some part of the contrast clause" (p. 270). Without going into the details here, note that Sæbø (2003) investigates quite thoroughly the concept of alternatives in these contrastive coordinations. It is often necessary to accommodate an appropriate alternative, for instance if there is no contrastive topic in the *but*-conjunct which has a structural counterpart in the context. This happens if the entire second conjunct constitutes the focus as in the following example:

(23) The team had a chance to score a goal, but the ball was stopped by the goalie.

Sæbø assumes that there is an implicit topic in these cases, which corresponds to the complement of the *but*-conjunct, i.e. *the ball wasn't stopped by the goalie*. The same solution is offered in Umbach (2001, 2005). The actual alternativeness with the first conjunct according to Sæbø then has to be accommodated by generating implicatures based on the Gricean Relevance Maxim or on world knowledge (also see Koenig & Benndorf 1998 or Lang 2003 for a discussion of this).

### 3 *Aber* in Gapping Constructions

In this section, I shall apply the findings from the above discussion to gapping. Before I come to the ellipsis, though, I shall look at coordinations of full clauses coordinated with *but* that display the prototypical gapping structure, i.e.

<sup>7</sup> Here is his formal semantics of *but* (prefinal version):

(i)  $\sigma \models \llbracket \text{but } \phi \rrbracket \tau$  iff  $\sigma \models \llbracket \phi \rrbracket \tau$  and  $\sigma \models \neg \phi [T(\phi) / \alpha]$  for some alternative  $\alpha$

In words, a sentence  $\phi$  with *but* changes the contextually given information status  $\sigma$  to the updated information status  $\tau$ , iff the same sentence  $\phi$  without *but* does so and iff the contextually given information status  $\sigma$  presupposes that there is an alternative to the topic of that sentence, for which  $\phi$  does not hold. The final version can account for sentences containing quantifiers:

$\sigma \models \llbracket \text{but } \phi \rrbracket \tau$  iff  $\sigma \models \llbracket \phi \rrbracket \tau$  and for some  $\alpha$ ,

$\sigma \models \lambda x \neg \phi [T(\phi) / x] (\alpha)$  or  $\sigma \models (\alpha)(\lambda x \neg \phi [T(\phi) / x])$

where if  $T(\phi)$  is type  $a$  or  $\langle \langle a, t \rangle, t \rangle$  for some simple  $a$ ,  $x$  may be type  $a$  or  $\langle \langle a, t \rangle, t \rangle$

constructions that involve two surface contrasts (section 3.1). I shall investigate how these surface contrasts interact with each other and with *but*. We shall see that if a negation is added to one of the clauses, the interaction changes. After that, I shall take a look at the intonation of German gapping sentences with *aber* (section 3.2) and give an analysis of gapping with negation that both incorporates the findings from section 3.1., and works with the information-structural sensitivity of *but* established in the previous section. I shall do this in terms of contrastive topics and foci as they have been analysed in Büring (2003) (section 3.3).

### 3.1 Reciprocal Implicatures in Parallel *but*-Coordinations

So far, we have not looked explicitly at examples involving two surface contrasts, which is the prototypical situation in gapping. Coordinations with two contrast pairs are discussed in some detail by Umbach (2005). Consider the following example (CT = contrastive topic):

(24) [John]<sub>CT</sub> [cleared the room]<sub>FOC</sub> but [Bill]<sub>CT</sub> [did the dishes]<sub>FOC</sub>. (Umbach 2005: 219)

Umbach points out that sentences like the above meet her confirm+denial condition without involving an explicit negation. They contain an implicit denial: (24) implies that John did not do the dishes and that Bill did not clear the room.<sup>8</sup> Thus, there seem to be reciprocal implicatures in these coordinations (we shall see that they are implicatures in a moment). Are they characteristic of *but*? Yes, they are, but they also occur in simple *and*-coordinations:

(25) John cleared the room and Bill did the dishes  
*implicates:*  
 Bill didn't clear the room and John didn't do the dishes.

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<sup>8</sup> Sæbø 2003 runs into trouble with these examples. Assuming that the subjects are the topics, we get the wrong prediction (see fn. 7 for the formalism):

- (i) John cleared the room but Bill did the dishes.  
 $\sigma \models \neg (\text{John cleared the room}) [\text{John/Bill}]$  iff  
 $\sigma \models \neg (\text{Bill cleared the room}) = \textit{false}$

Contrary to what is indicated by the formula, the context does not presuppose or assert that it is not the case that Bill cleared the room. It only says that John did that. It is the *but*-conjunct that implicates that Bill didn't clear the room (unlike John). Choosing the predicates as topics neither provides the correct result (for non-systematic alternatives, the complement of the predicate serves as implicit topic, see Sæbø 2003 for details):

- (ii)  $\sigma \models \neg (\neg(\text{John cleared the room})) [\text{clear the room/do the dishes}]$  iff  
 $\sigma \models \neg (\neg(\text{John did the dishes}))$  iff  
 $\sigma \models \text{John did the dishes.} = \textit{false}$

The third possibility, that the second conjunct might be all-focus seems far-fetched (also see below for the information structure of gapping).

The difference between *and* and *but* lies in how easy it is to cancel the implicatures. With *and* this seems to be much easier than with *but*:

- (26) a. John cleared the room **and** Bill did the dishes; actually though, {Bill cleared the room too / John did the dishes too}.
- b. John cleared the room **but** Bill did the dishes; actually though, {??Bill cleared the room too / ??John did the dishes too}.

Nevertheless, it is not completely impossible to cancel the implicatures in *but*-coordinations (thanks to Manfred Krifka for pointing this out to me):

- (27) *Context: Max is good at maths but not so good at English; Eva is good at English but not so good at maths. They did a test both in maths and in English. One of the two will be rewarded for good results. Give us an argument for who should be the one.*
- Max got a B in English but Eva even got an A in maths. Of course, Eva also got at least a B in English – but that’s no news. Likewise, Max got an A in maths.

It is quite clear that the context has to be very specific to make a cancellation possible. Normally, a cancellation of the implicature in the context of *but* cannot be done by the same speaker – Umbach speaks of entailments and not of implicatures. At most, a different speaker can protest and claim that the first speaker was wrong. This is not the case in coordinations with *and*, which allows the implicatures to be cancelled much more easily.

Umbach (2005) suggests that the implicatures arise due to a distinctiveness condition, which requires contrastive topics to have different focus predications (Krifka 1999). Note, however, that this is a general feature of contrastive topics – otherwise coordinations with *and* would not give rise to the implicatures. Thus, it seems that *but* interacts in specific ways with the contrastive topics, which is what we would expect from the discussion in section 2.

As a next step, let us investigate how the reciprocal implicatures behave if one or both of the conjuncts contain clausal negation in addition to the two contrasts considered above. Let us start with two negative conjuncts (in this and in the following section, I shall use identical first letters for names and animals in one conjunct as a mnemonic):

- (28) Carl did not stroke the cat, but Dean did not stroke the dog.
- implicates:*
- a. It is not the case that Carl did not stroke the dog.
- b. It is not the case that Dean did not stroke the cat.

We see that the presence of a negation as such does not alter the situation. The reciprocity of the implicatures is retained. What is interesting about this

structure is that the negation neither in (28)(a) nor in (28)(b) can be resolved to a positive. (28) neither implicates that Dean stroked the cat nor that Carl stroked the dog.

The following is an example with a negative first conjunct and a positive second conjunct:

(29) Carl did not stroke the cat but Dean stroked the dog.

Here, the coordination does not give rise to any reciprocal implicatures. Maybe one is tempted to accept the following as an implicature:

(30) It is not the case that Dean did not stroke the cat.

Yet upon closer examination, we realise that we do not really know anything about Dean's dealings with a cat. (30) is a very weak statement: it might be taken to indicate that Dean probably did not have anything to do with a cat at all. Likewise, (29) implicates nothing about Carl and the dog.

We see that the reciprocity is reduced if a clausal negation is present in one of the conjuncts. As a matter of fact and as we shall see shortly, if the polarity of the conjuncts differs it is this polarity which becomes the (contrastive) focus. Other individual contrast pairs are no longer 'accessed'. This can be seen clearly when we formulate a discourse topic (question under discussion etc.) for the coordinations, which highlights the information structure of the clause (and is different from the background hypothesis in the interpretation of *but*, also see below). For a coordination with parallel polarity such a discourse topic looks as follows:

(31) Who did not stroke whom?

Carl did not stroke the cat, but/and Dean did not stroke the dog. = (28)

The two conjuncts contrast in their subjects and in their objects. The predicate and polarity are constant. One of the *wh*-interrogatives elicits as an answer a contrastive topic whereas the other elicits a focus. Which is which depends on the discourse structure. We shall come back to this in a minute (section 3.3). Now consider the case with negative polarity in the first conjunct and positive polarity in the second conjunct. The relevant question is a polarity question, which indicates that the focus of the answer is the polarity of the sentence:

(32) Did x stroke y?

Carl did not stroke the cat but/and Dean stroked the dog. = (29)

In section 3.3, I shall argue that the variation of the individual variables *x* and *y* is a variation of foci within a contrastive topic.



- (34) Susan's histrionics in public have always gotten on Nan's nerves, but it's getting worse.  
 Yesterday, when she couldn't get her daily Egg McMuffin because they were all out, Sue became upset and Nan {became / # ~~became~~ } downright angry.

Lang (2004) assumes maximally parallel, contrastive coordinations to contain (contrastive) topics and foci (see (33)(a)). This ties in neatly with the information-structure based theories of *but* proposed by Umbach (2001; 2005) and Sæbø (2003).

Contrastive topics in German are usually assumed to be marked by a rising accent L\*H (e.g. Büring 1994; 1997, 2003; Féry 1993; Frascarelli & Hinterhölzl to appear; Höhle 1992; Jacobs 1982, 1996<sup>9</sup>; Krifka 1998; Mehlhorn 2001; Steube 2001). A focus is assumed to be marked by a fall H\*L, at least when in nuclear position (prenuclear foci can be indicated by L\*H). The two accents together, i.e. a sequence of a contrastive topic and a focus, is known under the name of *bridge* or *hat contour*.

In the following examples, I indicate a rising accent with a forward slash '/' before the accented word. A fall will be indicated with a backslash '\'. As always, small capitals indicate accents in general. For better readability, I will not mark boundary tones. The two conjuncts always form individual intonational phrases (with a rising or falling boundary tone).

Let us investigate the intonational make-up of the German gapping counterpart to (29) above, which has clausal negation in the first but not in the second conjunct. Out of a variety of possibilities only one arises as fully grammatical. This is the one in (35)(a).

- (35) *Context: A situation where a number of people, Karl and Hans amongst them, were expected to stroke or not to stroke two pets that were present in the situation (the cat and the dog). We want to know what exactly happened:*
- a. /KARL hat die /Katze \NICHT gestreichelt, aber /HANS den \HUND.
  - b. ?/KARL hat die Katze \NICHT gestreichelt, aber /HANS den \HUND.
  - c. ?Karl hat die /Katze \NICHT gestreichelt, aber / HANS den \HUND.
  - d. ?/KARL hat die \Katze nicht gestreichelt, aber / HANS den \HUND.  
 'Karl did not stroke the cat but Hans ~~stroked~~ the dog.'

(35)(a) can also be expressed by a construction that has an affirmative particle in the second conjunct:

- (36) /KARL hat die /Katze \NICHT gestreichelt, aber /HANS den /HUND \SCHON.

The other versions in (35) are degraded.

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<sup>9</sup> Jacobs (1996) actually argues that a fall-rise accent HL\* H is the appropriate accent. Evidence from corpora (Frascarelli & Hinterhölzl to appear) and experiments (Féry 1993), however, suggest that L\*H is sufficient.

Importantly, the accent pattern given in (35)(a) is typical of the conjunction *aber*. If we replace *aber* by *und* the coordination becomes ungrammatical: the gapping sentence cannot be interpreted:<sup>10</sup>

(37) \*/KARL hat die /Katze \NICHT gestreichelt, und /HANS den \HUND.

Indeed, the typical intonation contour of gapping with *and* has been identified as one where the contrast pairs carry strong pitch accents whereas elided material is deaccented (for experimental evidence see Carlson 2001a, b; Féry & Hartmann 2005; Winkler 2003, 2005). This is the intonation contour given in (35)(d) above, where *nicht* and the verbs are unaccented and the DPs are accented. Nevertheless, note that even with *and* the construction is marginal, see (38):

(38) ?/KARL hat die \Katze nicht gestreichelt, und /HANS den \HUND.

The reason for this is syntactic, as I have argued at length in Repp (2005).<sup>11</sup> The marker for clausal negation in German is an adjunct. Adjuncts, as opposed to heads and arguments, are only copied post-cyclically in the ellipsis process. The marginal status of sentences with an elided clausal negation arises because in the ellipsis process, interpretation is carried out first after completion of the cyclic operations and then again after the post-cyclic operations, which in the case of the post-cyclic adjunction of the negation leads to a contradiction. This analysis accounts for the cross-linguistic differences between languages where the negation is a head (English, Slovak, Turkish) and languages where the negation is an adjunct (German, Danish, Dutch), which were mentioned in fn. 2. The former are generally much happier with an elided negation in gapping than the latter.

The special role of ellipsis in the marginality of (38)(a) can also be seen if we compare the elliptic with the non-elliptic variant. The latter is fine, as (39) shows:

(39) /KARL hat die \Katze nicht gestreichelt, und /HANS hat den \HUND nicht gestreichelt.

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<sup>10</sup> The negative marker in gapping sentences conjoined by *and* can only be accented if a wide-scope interpretation, i.e.  $\neg(A\&B)$ , is intended, and this requires the two conjuncts to occur in one intonational phrase and the negative marker to take a different position in the clause (before the object DP *die Katze* in this case), see Repp (2005). The subject and object contrast pairs are usually deaccented:

(i) Karl hat NICHT die Katze gestreichelt und Hans den Hund.

<sup>11</sup> One might think that the falling accent on *Katze* is the problem here. Yet, as Féry & Hartmann (2005) showed experimentally, it is possible to realise the last contrastive element in the first conjunct of an 'ordinary' gapping sentence with a rising L\*H followed by a high boundary tone, or, alternatively, with a falling H\*L followed by a low boundary tone.

Comparing (38) to (35)(d), i.e. the same intonational variant with *but*, repeated below for convenience, we find that the version with *but* behaves pretty similar to the one with *and*: the second conjunct still rings with a tint of negation:

- (35) d. ?/KARL hat die \KATze nicht gestreichelt, aber / HANS den \HUND.  
'Karl did not stroke the cat but Hans ~~didn't~~ stroke the dog.'

No such thing happens in the other intonational variants, (35)(a-c), where the negative marker is accented. There, the second conjunct clearly is positive. (35)(d), like its counterpart with *and*, is not fully grammatical because of the adjunct status of the clausal negation. Yet again, the non-elliptic version of (35)(d) with two negative conjuncts is fine, see (40)(a), although it would be used in a different context from the *and*-version. Note that without a negation in the second conjunct, (35)(d) without ellipsis is no better than the ellipsis variant, see (40)(b)<sup>12</sup>:

- (40) a. /KARL hat die \KATze nicht gestreichelt, aber / HANS hat den \HUND nicht gestreichelt.  
b. ?/KARL hat die \KATze nicht gestreichelt, aber / HANS hat den \HUND gestreichelt.

### 3.3 The Information Structure of Gapping with *but*

To see more clearly what is going on in (35), and why the accents in felicitous (35)(a) are the way they are, it is useful to take a look at Büring's (1997, 2003) theory of contrastive topics and foci in a well-formed discourse, as it is developed in Büring (2003). This will provide us with the means to explain why in gapping sentences with *aber/but*, whose first conjunct contains a negation which seems to be elided in the second conjunct, this second conjunct is interpreted as positive.

Büring (2003), similarly to van Kuppevelt (1995, 1996) represents discourses in discourse trees (also see Roberts 1996). Each node in such a tree represents a syntactic phrase marker which corresponds to a declarative or interrogative sentence. The order of the nodes is fully determined by their linear order. Büring proposes that a contrastive topic (CT) *indicates a strategy* in a dis-

<sup>12</sup> It has been suggested that the conjunctions *hingegen* ('in contrast') and *dennoch* ('nevertheless') can serve as substitutes for *aber* in purely contrastive readings (*hingegen*) and implicative readings (*dennoch*), respectively (Breindl 2004; Stede 2004; Lang 2004). Using these conjunctions in example (40)(a), we find that *hingegen*, the contrastive connector, is fine whereas *dennoch* is (at least) marked, see (i) and (ii). In (40)(b), in contrast, *hingegen* cannot be used (not illustrated), the case with *dennoch* is not so clear and needs some closer scrutiny, which I cannot provide here.

(i) /KARL hat die \KATze nicht gestreichelt, / HANS *hingegen*, hat den \HUND nicht gestreichelt.  
(ii) ??/KARL hat die \KATze nicht gestreichelt, *dennoch* hat / HANS den \HUND nicht gestreichelt.

course, where a *strategy* is a subtree in the discourse tree that is rooted in a node representing an interrogative sentence, and where *to indicate a strategy* means:

- (41) To indicate a strategy (Büring 2003: 520):  
 There is a non-singleton set  $Q'$  of questions such that for each  $Q \in Q'$   
 (i)  $Q$  is identical to, or a sister of, the question that immediately dominates the utterance  $U$  containing the contrastive topic accent, and  
 (ii)  $\llbracket Q \rrbracket^o \in \llbracket U \rrbracket^{ct}$

$\llbracket \rrbracket^{ct}$  is a function that yields CT-values, which is an extension of the function that produces focus semantic values (Rooth 1992). Informally, it works as follows<sup>13</sup>:

- (42) CT-value formation (Büring 2003: 519):  
 step 1: Replace the focus by a *wh*-word and front the latter; if focus marks the finite verb or negation, front the finite verb instead  
 step 2: Form a set of questions from the result of step 1 by replacing the contrastive topic by some alternative to it.

For ease of exposition, let us apply this first to infelicitous (35)(b), whose first conjunct contains one contrastive topic accent and one focus accent:

- (43) /KARL hat die Katze NICHT\ gestreichelt (= first conjunct of (35)(b))  
 step 1: Did Karl<sub>CT</sub> not stroke the cat? – *fronting of finite verb*  
 step 2: Did Hans<sub>alternative</sub> not stroke the cat? – *substitution by alternative*

The formal CT-value, which is an abstraction over the question set, looks as follows:<sup>14</sup>

- (44)  $\llbracket \text{Karl}_{CT} \text{ did not stroke the cat} \rrbracket^{ct} = \{ \{ (x \text{ stroked the cat}); \neg(x \text{ stroked the cat}) \} \mid x \in D_c \}$   
 $\approx$  Did  $x$  not stroke the cat?

Now, when inferring a strategy from a contrastive topic, hearers also infer a more complex discourse structure. The utterance /KARL did NOT stroke the cat constitutes only the left branch of the strategy it indicates. Hearers infer that in addition there is a right branch. This right branch, like the left branch, must

<sup>13</sup> For a formal definition, see Büring (2003: 539).

<sup>14</sup> The alternative set of the topics and foci must of course be restricted. This is part of the normal contextual restrictions of alternative sets. In this particular case, referents of  $x$  should probably only alternate with human individuals. The alternative set of the focus in (44) contains the values ( $\neg$ ) and (non-negated). Also see Lang (2004) on this with respect to contrastive *aber*-constructions.

answer the question *Did x not stroke the cat?* It is prompted by a(n implicit) subquestion such as *Did Hans not stroke the cat?* The assumption that there must be a right branch of a strategy is a conventional implicature triggered by the contrastive accent (see Büring 2003 for details on this). Furthermore, speakers infer that for an  $x \neq \text{Karl}$ , the answer to the question *Did x not stroke the cat?* will be different from the answer for Karl (also recall Krifka's 1999 distinctiveness condition). This is a conversational implicature (Maxim of Quantity).

Büring illustrates this effect for a transitive sentence originally discussed by Jackendoff (1972), where the subject is the contrastive topic and the object is the focus:

- (45) What about Fred? What did he eat?  
 /FRED ate the \BEANS.<sup>15</sup>  
 $\llbracket \text{Fred}_{\text{CT}} \text{ ate the beans}_{\text{F}} \rrbracket^{\text{ct}} = \{ \{x \text{ ate } y \mid y \in D_e\} \mid x \in D_e \}$   
 $\approx \{ \text{What did Fred eat? What did Mary eat? What did Joey eat? ...} \}$

The assumption made by conversational implicature would be that other people than John ate other things than beans. The option to continue the declarative in (45) with *but I don't know what the others ate*, makes clear that the implicature about the contrastiveness of the focus can be cancelled. This means that in (43) a focus accent on the negation in the first conjunct makes us expect a difference in polarity between first and second conjunct: the second conjunct should be positive.

With this in mind, let us go back to (35)(b), repeated here for convenience:

- (46) ?/KARL hat die Katze \NICHT gestreichelt, aber /HANS den \HUND. (= (35)(b))

We found that the contrastive topic value here is something like *Did x not stroke the cat?* (see (44)). Crucially, the second conjunct of (35)(b) has nothing to say about this. (*Not*) *stroking the cat* is not at issue. Rather, the second conjunct introduces a strategy of its own. It brings in another individual  $y$  (*the dog*) which needs its alternative. This, however, is not compatible with the strategy introduced by the first conjunct. Consequently, the coordination is degraded, or in Büring's words, it is incongruent because it is defective in its intonational form.

For (35)(d), which we already discussed above and where the negation in the first conjunct does not carry a focus accent, Büring's algorithm yields the following CT value for the first conjunct:

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<sup>15</sup> In English, it is a simple rise L+H\* that in general marks a topic.

- (47) ?/KARL hat die \KATZE nicht gestreichelt, aber / HANS den \HUND. (= (35)(d))  
 $[[\text{KARL}_{CT} \text{ did not stroke the } \text{CAT}_F]]^{\text{ct}} = \{\{\neg(x \text{ stroke } y) \mid y \in D_e\} \mid x \in D_e\}$   
 $\approx$  Who did not stroke whom?

Note that the CT-value is no longer a set of polarity questions. Instead, it corresponds to a set of multiple *wh*-questions, where one of the *wh*-interrogatives will be answered by the contrastive topics and the other, by the foci (also cf. (45)). Provided the second conjunct contains a negation, both the first and the second conjunct are compatible with the CT-value. This explains why the sentence is good as a full clause coordination (ex. (40)). The discourse is coherent. Yet, as we already saw above (p. 17), this interpretation is not available for the ellipsis case because of independent reasons.

We have seen two examples now which indicate that the information-structural and intonational pattern of gapping sentences with *aber* can be directly related to the account of contrastive topics given by Büring (2003). The third intonational variant, (35)(c), is degraded for similar reasons as (35)(b). I shall not go through this here. What is more interesting is the grammatical version (35)(a). I repeat the example:

- (48) /KARL hat die /Katze \NICHT gestreichelt, aber /HANS den \HUND. (= (35)(a))

What is remarkable about (35)(a) is that it has three accents in the first conjunct instead of only two. The question that immediately comes to mind is whether the third accent is a topic accent or a focus accent. We furthermore want to know what this means for the information structure of the coordination.

We said above (ex. (32)) that the discourse topic of this coordination, which – the reader will have noticed this by now –, is identical to the CT-value of the first conjunct, seems to be a set of questions of the following sort:

- (49) Did *x* stroke *y*?

I would like to argue that *x* and *y* in (49) together form one composite contrastive topic: they are F-marked elements of the same contrastive topic.<sup>16</sup> This suggestion builds on Büring's (2003: 536) hypothesis that a CT in reality is a combination of a CT-mark and an F-mark (also see Krifka 1998). CTs only mark strategies and they are not related to the status of givenness of a referent. In accordance with the theory of Schwarzschild (1999), an F-mark is assumed

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<sup>16</sup> Krifka (1999) proposes that in sentences with several topics, the topics are "stacked", i.e. one takes scope over another. The idea is that the speaker selects a discourse entity as the main topic and subdivides it into a secondary topic and a comment. While this is fine for (35)(a), examples like (51) are difficult for this view.

to mark only elements that are not given (principle Avoid F!). The CT-mark is then assumed to dominate the F-mark:

- (50) Q: Who ate what? (Büring 2003: 535)  
 A: [[FRED]<sub>F</sub>]<sub>CT</sub> ate the BEANS<sub>F</sub>.

Büring (2003) himself discusses the following case where there is deaccenting in a contrastive topic:

- (51) Where will the guests at Ivan and Theona's wedding be seated?  
 A1: [FRIENDS<sub>F</sub> and RELATIVES<sub>F</sub> of the couple]<sub>CT</sub> will sit [at the TABLE]<sub>F</sub>  
 A2: [REPORTERS]<sub>CT</sub> have to sit [in the BACK]<sub>F</sub>.

The contrastive topic in A1 is the entire subject, the CT-value being a question set of the form *Where will x sit?* – as evidenced by the second answer A2. For this second answer to be felicitous, the CT-value could not be a question set like *Where will x of the couple sit?* Therefore, Büring suggests that *of the couple* is part of the CT. It does not carry an accent because it is given.

For our example, this would roughly look as follows (preliminary CT-marking, more on this in a minute):

- (52) [/KARL<sub>F</sub> hat die /KATZE<sub>F</sub>]<sub>CT</sub> \NICHT<sub>F</sub> gestreichelt aber [/HANS<sub>F</sub> den \HUND<sub>F</sub> ]<sub>CT</sub>.

Notice that the last contrastive topic accent on *Hund* in the second conjunct is a falling accent producing a hat pattern for the whole conjunct. I assume that this is simply due to the fact that the accent combines with the low boundary tone typical for the end of a declarative sentence. The result is a contrastive topic accent that sounds like a focus accent. A similar phenomenon can be found in multiple accent sequences in general, and is known under the name of Linking (Féry 1993; Gussenhoven 1984).<sup>17</sup>

The other thing obviously to be noticed about (52), is that the focus – the positive polarity – is elided in the second conjunct.<sup>18</sup> I will come to that in a minute. Before, let us derive the CT-value for (52):

<sup>17</sup> Two H\*L pitch accents can be linked completely, e.g.:

(i) die LÄden der Innenstadt  
       H\*L      H\*L                  underlying accents  
       H\*      H\*L                  accents realised (deletion of L-tone due to linking with  
   following tone)

'the shops in the inner city'

<sup>18</sup> Note that the analysis carries over to stripping. The focussed polarity can be elided there too (contra Winkler 2003 who considers polarity adverbs obligatory in stripping):

(i) /Das MÄdchen hat die Katze \NICHT gestreichelt, aber \der JUNge.  
 'The girl did not stroke the cat but the boy did.'

- (53) step 1: Did Karl<sub>CT</sub> stroke the cat<sub>CT</sub>? – *fronting of focus, i.e. polarity*  
 step 2: Did Hans<sub>CT</sub> stroke the dog<sub>CT</sub>? – *alternatives for contrastive topics*  
 $\llbracket \text{KARL}_{CT} \text{ did not}_{CF} \text{ stroke the CAT}_{CT} \rrbracket^{ct} = \{ \{ \neg(x \text{ stroke } y); (x \text{ stroke } y) \} \mid x \in D_e \wedge y \in D_e \}$   
 $\approx \text{Did } x \text{ stroke } y?$

Thus, the CT-value is the relation of stroking between two individuals  $x$  and  $y$ . Importantly, instead of replacing only one F-marked constituent within a contrastive topic by an alternative, two must be replaced for the formation of one contrastive topic.

The inclusion of two F-marked constituents in one 'complex' CT has important consequences. I would like to argue that this is what causes the reduction of reciprocal implicatures in the case of asymmetric polarity in the two conjuncts observed in section 3.1. The conjunction *but* does not 'access' the individual contrast pairs in a coordination, i.e. there are no implicatures involving the subjects and the objects and the polarity. Rather, *but* accesses the composite contrastive topics (here the relation of stroking between two individuals) and it accesses the foci (here the polarity).

When I introduced example (52) above, I mentioned that the focus in the second conjunct of this example – the positive polarity – is elided.<sup>19</sup> I assume that this is possible because positive polarity generally does not receive a great deal of attention in natural language in terms of being marked by morpho-syntactic means. This is part of a general asymmetry between negative and positive polarity. Whereas a negative assertion has to be marked with 'additional' linguistic material this is not the case for positive assertions (Horn 1989).

There obviously are means to stress positive polarity in a sentence, such as VERUM focus marking (Höhle 1982; 1991) or the addition of affirmative elements like *schon*, which, as we saw above, is also possible in our gapping case (ex. (36), repeated below):

- (54) /KARL hat die /KATZE \NICHT gestreichelt, aber /HANS den /HUND \SCHON. (= (36))  
 'Karl did not stroke the cat but Hans ~~did stroke~~ the dog.'

What is remarkable about (54) is that the conjunction *aber* can be left out. Note that the accent pattern in the two conjuncts here is absolutely parallel: all the contrasts, including the polarity contrast, are marked as such. Importantly, though, the particle *schon* (similarly accented *wohl* ('very well'), which could replace *schon* here) can only be used in a context where the opposite of the

<sup>19</sup> It is also possible to deaccent the focus in the full clause counterparts of the elliptic coordinations. In (i), which is the full version of the grammatical gapping sentence in (35)(a), no contrastive accent is necessary on the auxiliary in the second conjunct. In (ii), on the other hand, whose first conjunct does not indicate a strategy involving a contrast in polarity, an accent on the auxiliary in the second conjunct produces a degraded result:

- (i) /KARL hat die /KATZE \NICHT gestreichelt, aber /HANS hat den \HUND gestreichelt.  
 (ii) ?/KARL hat die \KATZE nicht gestreichelt, aber /HANS/HAT den \HUND gestreichelt.

described situation was expected (as is the case with VERUM focus itself). Thus, in (54) it was expected that Hans did not stroke the dog. This is obviously the typical realm of contrastive *but* /*aber* as we described it in section 2.1. Note that it is not possible to use *und* ('and') in that example:

- (55) \* /KARL hat die /Katze \NICHT gestreichelt, und /HANS den /HUND \SCHON.  
'Karl did not stroke the cat and Hans ~~did stroke~~ the dog.'

Other languages, for instance Dutch, also allow affirmative particles in gapping structures of the above kind, see the following example with *wel* ('very well'):

- (56) /Karel heft de /KAT \NIET gestroken maar /HANS de /HOND \WEL.  
'Karl did not stroke the cat but Hans ~~did stroke~~ the dog.'

In contrast to German, though, the particle cannot be left out here. Similarly, the use of pseudogapping in English, which was mentioned briefly in the introduction, allows the speaker to express overtly the positive polarity of the second conjunct:

- (57) John ate rice but Jim did potatoes (= (8))

Why the particle should be obligatory in Dutch, or why pseudogapping is preferred in English by speakers who have this construction at their disposal, I do not know. When it comes to the strength of contrasts, it seems that contrastive *but* in general is more lenient in German than it is in Dutch or English. Also recall the restrictions on the use of English contrastive *but* in gapping sentences, where native speakers usually feel that the use of *but* is not justified because there is "not enough contrast". This might also have to do with the fact that both Dutch and English lack the lexical *aber-sondern* distinction.

To close this section, let us look at an example where the negation does not take clausal scope:

- (58) /Peter erwies sich erst /GESTern als nicht freundlich aber /MaRia schon vor einigen \TAgen.  
'Peter turned out to be not friendly only yesterday but Mary already ~~turned out to be not friendly~~ a few days ago.'

The *als*-phrase, which can be considered a small clause, marks the scope boundary for the negation contained in it. The conjunction *but* does not interact with this negation. The complement of *sich erweisen* ('to prove oneself') is still *nicht freundlich* ('not friendly'). This is what we expect from Lang's (1991) generalisation that contrastive *but* is a boundary for propositional operators (but not for non-propositional ones) and it also falls out from the above ana-

lysis. Importantly, the negation must not be accented. Accenting it produces an ungrammatical result rather than a positive reading for the second conjunct.

#### 4 Conclusion: Analysing Gapping with *aber*

My aim in this paper was to explain why contrastive *but* makes the negation 'disappear' in the second conjunct of a negative gapping sentence, i.e. why the second conjunct in a construction like (58) is interpreted as positive even though the first conjunct contains a clausal negation that seems to be elided in the second conjunct:

- (59) /KARL hat die /KATze \NICHT gestreichelt, aber /HANS den \HUND.  
'Karl didn't stroke the cat but Hans stroked the dog.'

I proposed that gapping constructions with *aber* are subject to the following restrictions:

- (60) i. Conjunct *A* contains a contrastive topic and focus so that both conjunct *A* and conjunct *B* answer a question in the set of questions indicated by the contrastive topic.  
ii. Contrastive topics are a combination of an F-mark and a CT-mark. A contrastive topic can contain several F-marks (Büring 2003).  
iii. All F-marked constituents in *A* have an alternative in *B*.

Thus, in symmetric coordinations there is no doubt that *but/aber* is sensitive to the information structure of the coordination it occurs in. It associates with contrastive topics and foci. The first conjunct of the coordination through its intonational make-up establishes a contrastive topic, which indicates a specific discourse strategy. The contrastive topic value, very much like a focus semantic value, contains variables for the F-marked constituents which stand for contextually appropriate alternatives. The second conjunct picks up on this value and provides appropriate alternatives. These alternatives form contrast pairs with the F-marked constituents of the first conjunct.

This algorithm ensures that if the first conjunct of a gapping sentence contains a clausal negative marker with a pitch accent, i.e. one that is F-marked and a focus, the second conjunct will have positive polarity. The contrast in polarity results from the obligatory contrast formation between every F-marked constituent and its alternative. The other contrast pairs in the clause are also F-marked and combine into one contrastive topic. This accounts for the loss of reciprocal implicatures between these contrast pairs in the presence of negation. Importantly, if the negative marker in the first conjunct is not a focus gapping is degraded because the negation will not be interpreted as contrasting

with the positive polarity of the second conjunct, i.e. will be taken to be present. This, as we know, is difficult in German.

Relating these findings to the theories that assume a third proposition to be operative in the background, we can say – for instance in terms of Merin's (1996) theory of stochastic relevance – that it is the contrastive topics and foci that specify the information which is responsible for making the individual conjuncts positively vs. negatively relevant for the background hypothesis. Whereas the contrastive topic and focus of one conjunct increase the likelihood of this hypothesis, the contrastive topic and focus of the other conjunct – which by definition are different from topic and focus of the first conjunct – decrease the likelihood of the hypothesis.

The story of *but* that I have told involves information-structural and semantic-pragmatic aspects. How do our findings relate to the syntax of gapping, more specifically to the mapping between syntax and semantics? It is unreasonable to assume that the syntax copies a negative marker that is not wanted by the semantics. Thus, we must assume that the negation in the *but*-coordination is not actually elided. Rather, there is a silent positive polarity morpheme which as a remnant contrasts with its correlate negative morpheme in the first conjunct. This fits in well with the finding that in languages like Dutch or English the positive polarity of the second conjunct is actually expressed by an overt morpheme – an adverb in Dutch and the finite *do*-dummy in English. Note that the behaviour of German gapping with *aber* disagrees with the assumption that contrasts in gapping always need to be signalled clearly with pitch accents in the second conjunct. Indeed, what we found is that the polarity contrast in the case of *aber* does not need to be signalled at all in the second conjunct. Rather, the job is taken by the elements in the first conjunct.

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Expressions for Index:

*but*

*aber*

topic, contrastive

topic, position

topic, alternative

topic, implicit

topic, composite

ellipsis

gapping

pseudogapping

implicatures, reciprocal

left dislocation

particle, modal

denial

quaestio

parallelism

discourse, strategy

discourse, tree

Short Portrait:

PhD in 2006 (Humboldt-Universität zu Berlin). Research Interests: syntax-semantics-interface, prosody, ellipsis, pronouns