A Compositional Analysis of Contrastive Topics*

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1. Decomposing Contrastive Topics

According to Büring (1997, 2003), an utterance involving a *contrastive topic* (CT) usually contains another constituent that invokes alternatives, a focus (FOC). Together they form what I will call a contrastive topic-focus-configuration (CTFC). This paper presents a new compositional analysis of contrastive topics, and presents syntactic evidence in its favor.

Büring (1997, 2003), following Jackendoff (1972), characterizes CTs in English as constituents marked by 'B-Accents' (in ToBI notation: L*+H followed by a L-H% boundary), and FOCs by 'A-accents' (H*, followed by a L- L% boundary). In German, CTs also often involve a rising pitch accent (possibly L* H) and FOCs a sharply falling one (a H* L according to Féry 1993, although the fall seems much sharper to me than in English). The two are linked with high level pitch, a configuration often referred to as 'hat-', 'bridge-', or 'root-contour' (Féry 1993, Jacobs 1997). In the following, I use a simplified notation: Accented words are in capitals, and I mark as '\ ', rises as '/', and fall-rises as '∨'. A typical use of a CTFC is what Büring (1997, 55–56) calls the contrastive 'aboutness topic'. Here, the question under discussion is addressed by the answer and its focus is marked by FOC, but in addition a CT is employed to invoke a set of additional questions:

(1) a. A: What did you buy on 59th street?
B: On /FiftyNINTH Street∨, I bought the SHOES.

b. German:

B: Auf der /NEUNundfünfzigsten Straße habe ich die SCHUHE\ gekauft.
on the 59th street have I the shoes bought

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The analysis of CTFCs in Büring (1997, 2003) has two main ingredients. The first is that of the 'topic-semantic value'. Just as an expression can be associated with a focus-value (Rooth 1992), i.e., a set of alternatives, in addition to its regular denotation, an expression can also be associated with a topic-semantic value, which consists of a set of sets of alternatives, in the case of propositions, a set of questions. Büring (2003, 519) provides the following procedure to obtain the topic semantic value, based on the assumption that there is one constituent marked as a FOC and one as a CT:

(2) CT-value Formation

a. Step 1: replace focus with wh-word and front the latter; if focus marks the finite verb or negation, front the finite verb instead.

b. Step 2: form a set of questions from the result of step 1 by replacing the contrastive topic with some alternative to it.

The topic-semantic value of the answer in (1a) would then be the set {What did you buy on 59th street?; What did you buy on 58th street?; What did you buy on 57th street?, ...}. The final notation for the topic-semantic value given in Büring (2003) looks as follows:

(3) $[\![\text{On 59th}_{CT} \text{ street, I bought the SHOES}_{FOC}.]\!]^{CT} = \{\{at\ x, I bought y | y \in D_e\} | x \in D_e\}$

This analysis marking constituents with CT and FOC features predicts that the linear order between the two should be free. Indeed, as observed in Jackendoff (1972), CTs in English can either precede or follow the FOC-marked constituent. Compare (1aa) with (4):

(4) FOC $\prec$ CT in English: A: What did you buy on 59th street?
B: I bought the SHOES on /FiftyNINTH Street$\vee$.

However, this is not true in other languages. In German, e.g., if the linear order of (1ab) is inverted, there is no felicitous pronunciation such that both constituents are accented:[1]

(5) FOC $\prec$ CT in German: A: What did you buy on 59th street?

B: # Ich habe die SCHUHE auf der NEUNundfünfzigsten Straße gekauft.
I have the shoes on the 59th street bought

That word order in German CTFCs is more restricted was already observed in Büring (1997), but the proposed analysis for contrastive topic remains mute with respect to the source of such syntactic restrictions. The solution proposed in this paper is based on an empirical observation: In English, when two focus operators are nested, they can take either scope with respect to each other—at least under certain syntactic conditions. This is not the case in German, where the focus operator taking wider scope must occur to the left of the one they outscope. This restriction, it is argued, also explains the restrictive

[1] The locative can be *deaccented*, but then it is simply marked as given and the sentence does not invoke a set of alternative questions.

relative word order in CTFCs: The contrastive topic configuration involves two recursively nested focus operators, and the associate of the one taking wider scope is what we call a CT. A challenge for this compositional view of contrastive topics is posed by the pragmatic effects of CTFCs. CTFCs seem to have a special pragmatic import, which nested focus operators usually lack. These pragmatic effects were one of the arguments used in Büring (1997) to argue against analyzing CTFCs as multiple focus constructions. The pragmatic implicature of CTFCs proposed in Büring (1997) can be paraphrased as follows:[2]

(6) There is a disputable question in the topic semantic value that remains open.

The proposed response to this challenge is to further decompose the meaning of contrastive topics: The pragmatic implications must be dissociated from the CTFC. They are the result speech-act related focus sensitive operators that are realized as intonational tunes, such as the English Rise-Fall-Rise contour (RFR), (cf. Constant 2006). Their meaning interacts with the focus operators that a sentence may contain, but this relation is indirect.

2. Nested Focus Operators

Krifka (1992, 24) identifies five configurations for multiple focus constructions:

(7) a. John only$_1$ introduced [Bill]$_{F1}$ to [Sue]$_{F1}$
b. Even$_1$ [John]$_{F1}$ drank only$_2$ [water]$_{F2}$
c. John even$_1$ [only$_2$ drank [water]$_{F2}$]$_{F1}$.
d. John even$_1$ only$_1$ drank [[water]$_{F2}$]$_{F1}$.
e. John even$_1$ drank [only$_2$]$_{F1}$ [water]$_{F2}$.

Suppose that a sentence can include two separate unpronounced focus operators. They might occur in any or all of these configurations. Here, I will explore the hypothesis that the configuration relevant for CTFCs as they are discussed in the literature is (7b), and that we call the associate of the focus operator that takes wide scope CT, and that of the one that takes narrow scope FOC. A straightforward prediction of this view is the syntax of CTFCs should mirror the distribution of *overt* focus operators.[3]

2.1 The case of English

In English, a focus operator can outscope material to its left (from Taglicht 1984, 150):

(8) They were advised to learn only Spanish.
a. They were advised not to learn any other language than Spanish.
b. They were not advised to learn any other language than Spanish.

[2] Büring (2003) states the implicature in terms of 'strategies' (Roberts 1996), with similar effects.

[3] Some earlier arguments against a multiple focus analysis of CTFCs compared them to multiple foci bound by *a single* operator. This is arguably the case in Büring (1997) and Neeleman and van de Koot (2007).

One analysis of (8b) is that 'only Spanish' undergoes covert movement (or overt movement as in Kayne (1998)). An alternative is that there is an unorthodox surface structure bracketing as proposed in the categorial grammar analysis in Blaszczak and Gärtner (2005). Both approaches correctly capture that the ambiguity disappears with VP-only:

(9) They were advised to only learn Spanish.
   a. They were advised not to learn any other language than Spanish.
   b. * They were not advised to learn any other language than Spanish.

What happens when two focus operators occur in one sentence? Let's consider 'only' and 'even'. A sentence including 'only' presupposes the prejacent and excludes all alternatives that are not already entailed by the presupposition (cf. Horn 1969, von Fintel 1999):

(10) Only John read *Moby Dick*.
   a. Presupposed: John read Moby Dick.
   b. Asserted: For all x, such that x read Moby Dick, John read Moby Dick $\rightarrow$ x read Moby Dick.

A sentence including 'even' asserts the prejacent and implicates that there are alternatives that are true but less likely (cf. Karttunen and Peters 1979, 25/26):

(11) Even John read Moby Dick.
   a. Asserted: John read Moby Dick.
   b. Conventional Implicature of 'even':
      i. There are other x under consideration besides John s.t. x read Moby Dick.
      ii. For all x besides John, the likelihood of x reading Moby Dick is greater than or equal to the likelihood of John reading Moby Dick.

Here's an example in which both focus operators appear in one sentence:

(12) **Context I: even $>$ only:** Except for Bill, the kids in this summer camp have no respect for animals and the potential dangers, which makes them take too many risks, including with poisonous snakes.
   a. Even the most poisonous snake only frightens Bill.
   b. Even the most poisonous snake frightens only Bill.

In this context, 'even' must outscope 'only' in order for it to make sense. Consider the alternatives relevant for 'only' and 'even':

(13) a. **alternatives for only (exclude 'even'):** {The most poisonous snake frightens Bill; the most poisonous snake frightens Bill and individual x; ... ; the most poisonous snake frightens everyone.}
   b. **alternatives for even (include 'only'):** {The most poisonous snake frightens only Bill (least likely); average poisonous snakes frighten only Bill (more likely); mildly poisonous snakes frighten only Bill (yet more likely); ... }

'Only' must take low scope and be part of every alternative considered for 'even' since otherwise the probabilities in (13b) reverse and the use of 'even' should be infelicitous. It is clearly *more* likely that a more poisonous snake frightens Bill, but it is *less* likely that it would frighten *only* Bill. So the meaning of this sentence can be characterized as follows:

(14) $[\lambda P_1$.even([the most poisonous snake])](P_1) ([λx.(only (Bill) (λy. x frightens y)]).

In (12), word order matches the scope. What about switching the word order?

(15) **Context I: even > only**

a. Only Bill is afraid of even the most poisonous snake.

b. # Only Bill is even afraid of the most poisonous snake.

When 'even' directly attaches to the focus, inverse scope is possible. The fact that (15b) is bad constitutes evidence that movement is involved. The wide-scope reading can be obtained by moving the constituent 'even the most poisonous snake' to a position dominating 'only Bill'. We can conclude that in English, a focus operator can take scope over focus operators to its left—as long as constraints on movement are obeyed. There is a controversy about whether apparent wide-scope uses of 'even' are not in fact due to a lexical ambiguity (a 'least likely' vs. a 'most likely' version, Rooth 1985, Rullmann 1997), although see Wilkinson (1996), Guerzoni (2003) who argue for the scope view. To circumvent this issue here, we can simply use a context motivating a reading with the inverse scope (this reading seems easier to access with emphasis on 'least'):

(16) **Context II: only > even:** The kids in the summer camp are afraid of snakes to some degree, but it depends on how dangerous they are. Everyone is afraid of rattlesnakes, since they're really poisonous, but almost everyone is ok with some less poisonous snake.

a. Only Bill is afraid of even the *least* poisonous snake.

b. Only Bill is even afraid of the *least* poisonous snake.

In this context, 'only' must outscope 'even' for the probabilities to come out right:

(17) a. **alternatives for even (exclude 'only'):**{Bill is afraid of the least poisonous snake (least likely); Bill is afraid of more poisonous snakes (more likely); ... ; Bill is afraid of the most poisonous snakes (yet more likely).}

b. **alternatives for only (include 'even'):** {Bill is afraid of even the least poisonous snake; Bill and individual x are afraid of even the least poisonous snake; ... ; everyone is afraid of even the least poisonous snake.}

Once again, the inverse linear order is possible keeping the scope constant:

(18) **Context II: only > even**

a. ? Even the *least* poisonous snake would frighten only Bill.

b. # Even the *least* poisonous snake would only frighten Bill.

Sentence (18a) improves when the moved constituent is heavier:

(19) Even the *least* poisonous snake would frighten only my truly pathetic roommate Bill Johnson.

To sum up: In English, a focus operator can outscope a focus operator to its left, provided that movement constraints are obeyed. The observed pattern provides an argument in favor of the scope analysis of ambiguities involving 'even', and against the lexical ambiguity theory. As expected, the distribution of wide-scope focus operators mirrors that of CTs.

2.2 The Case of German

German does not allow for Taglicht-like ambiguities in which a focus operator or negation outscopes material to its *left*[4]:

(20) Ihnen wurde geraten nur Spanisch zu lernen.
They were advised only Spanish to learn.

a. They were advised not to learn any other language than Spanish.

b. # They were not advised to learn any other language than Spanish.

There are only ambiguities with respect to how much material to the *right* is in the scope of a negation or focus operator in the German Mittelfeld (examples in Blaszczak and Gärtner 2005). The same restriction holds for the relative scope between two focus operators:

(21) **Context I: even $>$ only:**

a. **even $\prec$ only**

Sogar die GIFTIGSTE Schlange ängstigt nur BILL.
Even the most poisonous snake frightens only Bill

b. # **only $\prec$ even**

Nur den Bill ängstigt sogar die GIFTIGSTE Schlange.
only the Bill frightens Even the most poisonous snake

And in the context motivating the inverse scope, linear order must be reversed:

(22) **Context II: only $>$ even:**

a. **only $\prec$ even**

Nur den BILL ängstigt sogar die am WENIGSTEN giftige Schlange.
only the Bill frightens even the at least poisonous snake

b. #? **even $\prec$ only**

Sogar die am wenigsten giftige Schlange ängstigt nur den Bill.
Even the at least poisonous snake frightens only the Bill

[4]There are some exceptions to this generalization when considering the 'Vorfeld' in a V_2 sentence, cf. Jacobs (1983) and Jaeger and Wagner (2003).

The contrast between English and German with respect to the scopal constraints on overt focus operators exactly mirrors the restrictions of a CT relative to FOC in CTFCs. We expect now that across languages the syntax of contrastive topics should mirror that of the syntax of nested focus operators. There is some indication that this is be on the right track. In Hungarian, while the verb in general precedes all but one constituents in a sentence, CTFCs are realized with SOV word order (cf. Sauerland 2005):

(23) A: Ki mit ivott? B: János vizet ivott.
Who what.acc drank? Janos water drank
A: 'Who drank what?' B: 'Janos drank water [...].'

As expected, the same is true of at least some focus operators nested in configuration (7b):

(24) Hát ez unalmas party volt! Még János is csak vizet ivott!
well this boring party was even John too only water.acc drank
'This was a boring party! Even John drank only water.'

A more general explorations of cross-linguistic predictions would be necessary here.

3. Decomposing Contrastive Topics

The hypothesis advanced in this paper is that CTFCs involve two unpronounced focus operators nested in the same way as 'only and 'even' in (7b). The associate of the focus operator taking wider scope is what earlier approaches called a CT and the associate of the one taking lower scope FOC. I assume the following focus operator, a version of Rooth (1992)'s $\sim$, stated in terms of domain restriction (von Fintel 1994), and taking two overt arguments just like 'only' and 'even' (and similar to G_R in Wagner 2005, 2007)[5]:

(25) $\forall\sigma$: $[\![\text{FOCUS}]\!] = \lambda x_\sigma.\lambda P_{<\sigma,t>} : x \in dom(P) \& \exists a \in C : {}^\wedge p(a) is\ salient\ and\ {}^\wedge p(x) \not\Rightarrow {}^\wedge p(a)).P(x)$

Here's an example of a sentence involving a FOCUS:

(26) FOCUS (Moby Dick) (λx. John read x):

a. Assertion: John read Moby Dick.

b. Presupposition: There is a x' $\in$ C, such that *John read x'* is salient and John read Moby Dick $\not\rightarrow$ John read x.

What happens when we nest two FOCUS operators?

(27) A: What did you buy on 59th street? B: /On 59th street$\vee$ I bought the shoes$\backslash$.

The proposed LF parallel to that of nested overt focus operators looks as follows:

[5]This is a more explicit version of the entry in previous versions of this paper. Thanks to Pranav Anand, Daniel Büring, and Jon Gajewski for helpful discussion.

(28) [λP_1. FOCUS (on 59th street)(P_1)] ([λx.(FOCUS (shoes) (λy. I bought y at x)]).

To interpret this, the focus argument of the higher operator must be in the domain of its second argument. As already tacitly assumed for the overt operators, we can achieve this by the following assumption:

(29) Def.: $a \in dom[\lambda x : F(x).G(x)] \iff F(a)$

The presuppositions introduced by the two focus operators can be paraphrased as follows:

(30) a. Inner FOCUS: ∃ y' such that *I bought y' on 59th street* is salient, and is not entailed by *I bought shoes on 59th street*.

b. Outer FOCUS: ∃ x' such that ∃ y' such that *I bought y' at x'* is salient and not entailed by (30a) and *I bought the shoes on 59th street*.

There is an asymmetry in the strength of the presupposition associated with the two focused constituents, and switching the roles in this context changes the meaning:

(31) [λP_1.FOCUS (the shoes)(P_1)] ([λx.(FOCUS (on 59 street) (λy. I bought x at y)]).

(32) a. Inner FOCUS: ∃ y' such that *I bought shoes at y'* is salient, and is not entailed by *I bought shoes on 59th street*.

b. Outer FOCUS: ∃ x' such that ∃ y' such that *I bought y' at x'* is salient and not entailed by (32a) and *I bought the shoes on 59th street*.

This accounts for why switching the roles of CT and FOC can lead to an infelicitous result. In some CTFCs word order can be freely exchanged it seems (cf. Neeleman and van de Koot 2007), even in German. This can be explained now since in a pair-list context, the presuppositions of *either scope* are fulfilled, so arguably what changes here is not the relative order of CT relative to FOC but which constituent *is* the CT:

(33) A: Who invited whom?

B: Hans hat Petra eingeladen, Pia Maria, und Rudi wurde von Suza eingeladen.
Hans has Petra invited, Pia Maria, and Rudi was by Suza invited

CTs associate with focus operators that take wide scope, but CTs themselves can scope low. In fact, any analysis claiming contrastive topics *themselves* must take wide scope would be doomed, since, as is well-known, the intonation contour that often accompanies CTFCs often has the effect of scope reversal, such that a CT is outscoped by a FOC. How is this compatible with the presented analysis? That operator and associate can take different scope is in fact a general property of focus operators—overt focus operators in German cannot reconstruct, *yet their associate is free to do so* (Büring and Hartmann 2001, 262):

(34) Nur ein Bild von seiner Frau besitzt jeder Mann t.
only a picture of his wife possesses every man

a. LF: only__possesses every man$_i$ [a picture of his$_i$ wife]
The only person every man possesses a picture of is his wife.

b. * LF: ___ possesses every man$_i$ [only a picture of his$_i$ wife]
Every man only possesses a picture of his wife.

A look at the LF in (28) reveals what's going on: While the higher focus operator is interpreted taking scope over the embedded one, the constituent it associates with is actually interpreted in its base position via λ-abstraction, and may take wide or narrow scope relative to the associate of the lower focus operator, depending on where it starts out. The scope of the associate of the higher focus operator is thus expected to be whatever its scope is before associating with it (as in Jacobs 1997). I will return to why it is that sometimes contrastive topics seem to favor scope inversion in the next section.

There have been at least two earlier attempts to derive the semantics of CTFCs by recursively nesting two focus operators. Williams (1997) proposes such an analysis, but posits that contrastive are *embedded* foci and take *narrow* scope. This, however, conflicts with the scope facts discussed here. Sauerland (2005) proposes that contrastive topics involve two nested givenness operators, leading to entirely symmetric presuppositions for the operators associating with CT and FOC:

(35) John$_T$ saw Mary$_F$.

a. Presupposition 1: John saw someone.

b. Presupposition 2: Someone saw Mary.

Just as the approach in Büring (1997), this wrongly predicts that CT and FOC should *always* be interchangeable, and there should not be any syntactic constraints on relative word order. An non-compositional approach with very different predictions about the syntactic distribution of CTFCs is presented in Neeleman and van de Koot (2007). A detailed discussion of any of these alternative approaches is beyond the scope of this paper.

4. The Pragmatic Effects of Contrastive Topics

What about the pragmatic implications and the special intonation attributed to CTFCs in Büring (1997, 2003)? Aren't these good reasons to distinguish contrastive topics from two nested focus operators, as argued in Büring (1997)? The response proposed here is that the pragmatic effects and the intonational tune associated with them in fact must be dissociated from CTFCs. If this response is valid, then there are two expectations: First, the tune and pragmatic effects should be able to occur *without* a CTFC; and second, CTFCs should be possible without these pragmatic effects and without the correlating intonation.

4.1 Dissociating Intonation and Topic/Focus-Value: English B-Accents

Jackendoff (1972, 261) claims that A and B accents can occur in either order.

(36) a. A: Well, what about Fred, what did he eat?
B: /FRED$\vee$ate the BEANS.

b. A: What about the beans? Who ate them?
B: FRED ate the /beans∨.

Büring (1997, 2003) takes B-accents as an exponent of CT marking, and A-accents as exponents of FOC. I propose, however, to analyze the 'B'-part of AB as an instance of the rise-fall-rise contour (RFR), which has a meaning of its own. The 'A'-part of 'AB' can be analyzed as the normal pitch accent usually carried by focused constituents. This part is absent when RFR combines with constituents that only contain one accent:

(37) A: Do you think Mary was involved in the candy store robbery?
B: She likes CHOCOLATE∨.

This type of example was taken in Büring (2003) to involve a CT without a FOC.[6] But Ward and Hirschberg (1985) simply analyze this RFR pattern to be a sentence tune indicating speaker uncertainty. Oshima (2005) and Constant (2006) subsume the meaning of the intonational morpheme involved to that of focus operators operating on alternatives. Constant (2006) adapts the speaker-uncertainty approach and holds that RFR introduces the conventional implicatures that the 'none of these alternatives can safely be claimed'. Hara and van Rooij (2007) propose a very similar implicature for contrastive topics, namely that 'one of the topic-alternatives is not known to be true'. I propose a slightly different operator that requires *that one alternative is possibly true*, closely following Oshima (2005):

(38) $[\![\text{RFR}]\!] = \lambda p : \exists p' \in C, {}^{\wedge}p \not\rightarrow {}^{\wedge}p' and \Diamond p'.\ p$

Gricean reasoning leads to the implicature that the speaker did not assert the alternative for a reason, be it uncertainty, politeness, or something else.[7] If the expression contains a focus then the evoked alternative can but doesn't have to be one of the focus alternatives, maybe because an additional wide focus can occur. RFR actually seems to combine with speech acts and operate on alternative assertions, and cannot be embedded. An insinuation is always made at the matrix level:[8]

(39) John thinks that she likes CHOCOLATE∨.

The analysis in (38) accounts for why (40) is infelicitous: if 'they' had a boy, the salient alternative—'it's a girl'—must be false (observed in Ward and Hirschberg 1985, 755). But now observe (41), which, by contrast, is felicitous: 'they' may still also have a girl, even if they have a boy, but maybe the speaker is not sure about this:

(40) A: Did they have a boy or a girl?
B: # They had a BOY∨.

(41) Do they have kids of both genders?
B: They have a BOY∨.

[6]The analysis invokes an additional polarity focus, thus creating a topic semantic value.

[7]Several people made the plausible suggestion to me that RFR should mean something stronger, namely that the alternative is possibly true and possibly false. I do not have room to discuss this here, but it would make the analysis of RFR more similar to the one proposed for CTs in Hara and van Rooij (2007).

[8]It seems that RFR can't even embed under verbs like 'say', and always outscopes matrix predicates, but see Constant (2006, 40, fn. 37) for a contrary view. There is no space here to elaborate on this.

As discussed in Oshima (2005) and Constant (2006), RFR sometimes disambiguates: wide scope of the universal in (42) would rule out the possibility of any of the invoked alternatives to be true and therefore defeat the contribution of RFR. The relevant alternatives are invoked here by placing focus on the quantifier (i.e., 'some of my friends' would be one salient alternative):

(42) /ALL of my friends didn't come$\vee$. $^{*}\forall > \neg; \forall < \neg$

Büring (1997) proposed this explanation for disambiguating effects of CTFCs based on the implicature in (6). The AB/RFR contour is even compatible with a CT $\prec$ FOC sequence, although AB according to Büring (2003) should go with FOC $\prec$ CT:

(43) A: He's a picky shopper? B: Really? Where did you say did he buy his shoes?
A: He bought his SHOES on 5th AVENUE$\vee$; (and what's more he, buys his suits in Paris. Clearly, he's very picky.)

The 'BA-contour' differs from the 'AB-contour' in that it is compatible with contexts in which no 'disputable question' is left open, and hence does not in fact carry the implicature that contrastive topics are supposed to carry. The 'B' 's in the two contours (here noted as '$\vee$') are not the same element, probably neither semantically nor phonologically:

(44) A: Did John insult Mary?
B: No! Mary$\vee$ insulted JOHN$\backslash$.

(45) A: Did John insult Mary?
B: No! # Mary insulted JOHN$\vee$.

'BA', I propose, is actually just the intonation typical of nested foci more generally and is a result of normal pitch accent placement and a declarative tune. The fact that the first accent can be followed by a rise is probably a reflex of the prosodic boundary that separates the first focus operators and its associate from the second focus and its associate. 'AB' in (45) would be felicitous if there was some unrelated alternative that could be insinuated, but given the context it's not clear what that would be. That 'BA' lacks the alleged contrastive topic implicature is further confirmed by Constant (2006)'s observation that the 'BA' but not 'AB' can occur on the last constituent in a pair-list answer:

(46) a. A: Who kissed whom? B: ANNA $\vee$kissed JOHN, and JIM $\vee$kissed BERTA.
b. # A: Who kissed whom? B: ANNA kissed JOHN, and JIM kissed BERTA$\vee$.

The fact that 'BA' is possible here (first observed in Krifka 1999) shows that 'BA' and 'AB' are not equivalent. The RFR is predicted to be infelicitous at the end of a pair-list answer since all true alternatives have been asserted and others excluded, so it would be pragmatically odd to invoke an alternative that is merely possibly true. Of course, the *entire pair-list answer* could be used to insinuate some other proposition, and indeed, then RFR is possible: Suppose A says: 'This was a boring party.' Then B could use the answer in (46b.) to insinuate: 'No, it wasn't!'—but no such context is necessary to use 'BA'.

The pragmatic effects attributed to CTFCs can be dissociated from them, and we can thus decompose the notion contrastive topics as described in Büring (1997, 2003) into the part that relates to the 'topic-semantic value' (here: two nested focus operators), and the part relating to pragmatic import (here: independent intonational operator).

4.2 Dissociating Intonation and Topic/Focus-Value: German Hat-contour

According to Ludwig (2006, 76), the meaning of the German hat contour involves an operator taking two foci as its argument and implicates: that "there is at least one true proposition (sentence) that is the result of replacing *both* foci with respective alternatives." Suppose we try to dettach the existence condition from the CTFC, analogous to the case of English:

(47) Hat-Contour: $[\![\text{HAT}]\!] = \lambda p : \exists p' \in C, {}^{\wedge}p \not\rightarrow {}^{\wedge}p' \textit{and } p' .\ p$

The hat-contour, just like RFR, is impossible when the only alternative is excluded:

(48) Did Hans insult Pia?
Nein. /PIA hat HANS\ beleidigt.
'No, Mary insulted Peter.'

(49) Did Hans insult Pia?
Ja genau. Und /PIA hat HANS\ beleidigt.
'Yes, he did. And Mary insulted Peter.'

The proposed analysis is arguably sufficient to account for the well-known (often scope-inverting) disambiguating effects of the hat-contour, analogous to the line taken in Büring (1997) and Ludwig (2006), and similar to the account of the disambiguating effect of the RFR in Constant (2006)—but there is no space here to explore this. A problem for this analysis appears to be that, according to Ludwig (2006, 50), the hat-contour seems to require two constituents with true alternatives , contrary to the RFR

(50) # /FRITZ hat das RADIO\ eingeschaltet, und /FRITZ hat den FERNSEHER\ eingeschaltet.
Fritz has the radio on.switched and Fritz has the TV on.switched
'Fritz turned on the Radio and Fritz turned on the TV.'

But the problem with (50) is simply that 'Fritz' is not marked as given. Once the prominence relations reflect the information structure the hat contour is possible *even without a double contrast.* The alternative proposition evoked here could be that Fritz is responsible:

(51) A: Why was there a short circuit? Who do you think was responsible?

B: /F. hat das RADIO\ eingeschaltet, /UND F. hat den FER.\ eingeschaltet.
F. has the radio on.switched and F. has the TV on.switched

In fact, the hat-contour can be 'clipped' and imposed on an utterance with a single accent:

(52) A: Was anyone at the party? B: SCHON\ . 'Yes.... (...but the wrong people)'

And it can be draped over fragments that involve two accented words but not two foci:

(53) A: What do you think of the candidate?
B: Eine /TOLLE REDE.\ 'A great speech... (...but he's still a scoundrel)'

The analysis here also correctly captures that the German hat-contour (but English RFR) can occur at the end of a pair-list question—even after a complete answer—since it does not imply that a proposition is merely possibly true. The analysis can also cover the use of the hat-contour in alternative question. When draped over a disjunction, the presupposition is that one alternative must be true. How subtle distinctions between variations of the hat-contour (Jacobs 1997) can be accounted for will have to remain open for now.

5. Conclusion

This paper presented evidence that the syntactic distribution of CTs relative to FOCs mirrors the distribution of nested overt focus operators, and is more restricted than earlier approaches would predict. An explanation was provided in the form of a compositional theory that analyzes CTFCs as recursively nested focus operators. The associate of the focus operator taking wider scope is what earlier analyses called a 'contrastive topic'. The pragmatic import that CTFCs seem to have and other nested foci seem to lack were attributed to independently motivated operators that are realized as intonational tunes, such as RFR in English and HAT in German. RFR requires an alternative to be possibly true and HAT that an alternative *is* true. This difference explains that RFR but not HAT are excluded in the last answer of pair list questions, since in the former but not in the latter a stronger statement could have been made using a stronger operator (e.g. EXH). The use of CTFCs is neither a sufficient nor a necessary condition on the presence of RFR or HAT, or the pragmatics associated with them.

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