

# Licensing focus on pronouns and the correct formulation of AvoidF

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## 1 Introduction

Focus can serve, among other things, to contrast a constituent with a previous one, thereby – pre-theoretically – making clear which part of an information is old and which is new. The two foci in (1), for instance, signal that the relation of kissing someone is old in the context given, i.e., it is given by the previous context. What is, however, not given is that Bill kissed Sue, i.e. it is new information and thus *Bill* and *Sue* must be focused – that is, they must be focus-marked (F-marked).

- (1) John kissed Mary. But BILL kissed SUE

Rooth (1992) argues that this effect can be captured by employing his notion of focus value.<sup>1</sup> For this approach to work it is essential that focus is interpreted by the semantic component. Recently it has been questioned whether it is really focus that is interpreted. Schwarzschild (1999) – but also Williams (1997), Sauerland (2005), Wagner (2006) – base their theories on the notion of givenness. These theories share the following: Essentially (1) is treated as an extension of the anaphor phenomenon – that is, non-focused material has a certain semantic trait that lets it get interpreted as anaphoric to some material in the previous discourse. Therefore focus values as a semantic primitive are dispensed with, at least for phenomena such as (1). As we will see, focus in such theories plays the role of identifying material that need not be given, i.e., need not be anaphoric to some antecedent constituent.

We will see that most if not all aspects of Schwarzschild's 1999 approach can be integrated into a theory using focus values as well. As has been shown by Schwarzschild (1999) there must be some condition, called AvoidF in his theory, that compares a structure with focus with the same structure without focus. The one without focus is to be preferred if givenness is satisfied. The empirical problem to be discussed in the present paper has to do with focus on pronouns that could in principle be interpreted

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<sup>1</sup>See Rooth (1985) and Kratzer (1991) for two prominent approaches on how to derive the focus value of a given constituent and the discussion below in section 4.

as bound or as referential. The gist of the present argument is that Schwarzschild's theory as it stands cannot deal with transderivational comparisons for focus licensing, i.e., situations where two different structures need to be compared. I suggest that the modification of the AvoidF-condition argued for by Truckenbrodt (1995) who considers it an instance of *Maximize Presupposition!* (MP!, cf. Heim (1991)), directly predicts these data and is thus to be preferred to Schwarzschild's formulation. In other words, I will argue for a principle that strives to reduce the size of focus values. AvoidF viewed this way straightforwardly allows us to compare two (independent) structures if they have the same ordinary semantic value, on the one hand, and focus values that are related by the proper subset relation, on the other hand. Therefore the present paper has two objectives: First, it investigates what the correct formulation of AvoidF should be like. Second, on a more conceptual level, it suggests that givenness can be implemented in a theory with focus values without any problems.

The paper is structured as follows: Section 2 summarizes the main points of a theory of givenness. In particular, I introduce as much as necessary from Schwarzschild's 1999 theory in order to see why the data from section 3 are problematic for it. Section 3 introduces the novel empirical observation and discusses the problem caused by it. Section 4 implements the theory of givenness by using Rooth's 1985 focus values and MP!. Schwarzschild's condition of AvoidF is modified accordingly. Section 5 returns to Schwarzschild's theory in more detail, and we show that the present theory can capture his insights as well. Section 6 concludes the paper.

## 2 Givenness and F-marking

Consider the discourse in (2). Only (2-a) is a felicitous continuation of (2), but (2-b) is not. Apparently the realization of F-marks is restricted in some way. In other words, a condition is needed that reduces the number of F-marks. One can only focus a constituent if it is absolutely necessary, it seems. What goes wrong in (2-b) intuitively is that *Obama* is already mentioned in the antecedent sentence and therefore does not qualify for F-marking. *Obama* is given. I will now briefly review Schwarzschild's 1999 theory, which was the first to my knowledge to propose a condition that reduces the number of F-marks. Moreover his theory is chosen because it can serve as an illustration of a system relying on givenness instead of focus values. I will return to discuss Schwarzschild's theory in more detail in section 5 once the empirical puzzle and the present theory have been introduced.

- (2) Obama praised Bush  
 a. No, Obama praised CLINTON  
 b. #No, OBAMA praised CLINTON

### 2.1 Schwarzschild's 1999 givenness and focus on pronouns

I will discuss Schwarzschild's theory by considering the data in (3). These are not actually discussed by him. But understanding them will be helpful to grasp the puzzle to be presented in the following section. It should be fairly easy to extrapolate the ac-

count for (3) to the problem in (2) above.<sup>2</sup> Consider (3) and the possible continuations in (3-a)-(3-b) under the reading where the pronoun *his* refers to Bill. Focus is required on the pronoun on this reading. The question to be addressed is why the pronoun in (3-b) must be stressed in the given discourse.

- (3) John likes Bill's mother, but ...  
 a. #BILL likes his mother  
 b. BILL likes HIS mother

Schwarzschild's basic idea is that the notion of givenness drives F-marking. In particular he assumes the condition in (4). That is, there is a condition that checks for each constituent that is not F-marked whether it is given. F-marked constituents are excluded from that condition and need not be given as a consequence.

- (4) GIVEN<sub>ness</sub>  
 If a constituent is not F-marked, it must be GIVEN.  
 (Schwarzschild 1999:155)

What it means for a constituent to be given is defined in (5). The definition requires that for each non-F-marked constituent there be an antecedent constituent in the context. The requirement in (5-a) is straightforward. The mechanism of existential type shifting existentially binds open argument positions of the expressions to which it applies. The existentially type shifted version of the antecedent constituent must then entail the existential F-closure of the utterance constituent. The existential F-closure of a constituent is the result of replacing each F-mark with a variable of the appropriate type and existentially type shifting the outcome of this process.

- (5) *Definition of GIVEN* (final informal version)  
 An utterance U counts as GIVEN iff it has a salient antecedent A and  
 a. if U is type e, then A and U corefer;  
 b. otherwise: modulo  $\exists$ -type shifting, A entails the Existential F-closure of U.  
 (Schwarzschild 1999:151)

Furthermore there is the constraint *AvoidF* in (6) which is responsible for reducing the number of foci. It is basically an economy condition. It states that if material is given, it need not be F-marked – that is, it compares two derivations, one with F-mark and one without F-mark. If the one without F-mark satisfies givenness for all its subconstituents, it is to be preferred to the one with F-mark, even if the latter one satisfies givenness for all of its subconstituents, as well.

- (6) AVOIDF  
 F-mark as little as possible, without violating Givenness.  
 (Schwarzschild 1999:156)

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<sup>2</sup>In short, (2-b) is a case of overfocusing. Both (2-a) and (2-b) satisfy Schwarzschild's condition of givenness in (4). The economy condition *AvoidF* (6) therefore applies and dictates that the structure with fewer F-marks is the only one that is licensed.

Let us now return to the discourse in (3) and see how the theory just introduced accounts for the data. But before going into detail, a further remark is in order, which is quite independent from the particular theory of focus licensing chosen to evaluate the data at hand. When we want to see whether the difference in acceptability of the two continuations of (3) is predicted, we have to consider at least two structures that could be assumed for each of the continuations. In particular, it seems that there is a choice between coreference and binding in (3-a) and (3-b). In the following, I investigate whether the account in terms of givenness discussed above yields the correct results when these two options are considered. I start by considering the coreference structure and then proceed to binding.

**Option 1: coreference** Let us first consider givenness for (7) – a possible representation of (3-a) – where  $g(1)$  refers to *Bill*. In other words, (7) shows the structure without F-mark on the pronoun coreferring with the subject.

(7) [BILL<sub>F</sub> likes 1's mother]

In all the cases to be considered in this section and the following one, givenness calculation yields the same results for the IP and VP constituents whenever one of the two counts as given. They will therefore not be discussed separately each time. The argument to be given now extends to the other cases, as well. For both the IP and the VP we have to find out whether  $\exists x[x \text{ likes } \textit{Bill's mother}]$ , their shared existential F-closure, is entailed by the existentially type shifted version of some antecedent constituent. The reason for this requirement is that the subject is always F-marked in the examples to be considered.<sup>3</sup> Indeed, *John likes Bill's mother* entails this. So both the IP and the VP are given. The property of liking is trivially given as well, and so is the individual *Bill's mother*.

Now consider the same structure with F-mark on the pronoun. Again,  $g(1)$  maps onto *Bill*:

(8) [BILL<sub>F</sub> likes 1<sub>F</sub>'s mother]

If there is focus on the pronoun, we need for both the IP and the VP a constituent such that its existentially type shifted meaning entails  $\exists x.\exists y[x \text{ likes } y's \textit{mother}]$ . Clearly, *John likes Bill's mother* does entail this. The property of liking is, of course, again given. Moreover the property of liking someone's mother is given because again *John likes Bill's mother* entails it. Since both the structure with focus on the pronoun and the one without focus on it satisfy givenness, AvoidF tells us that the latter must be used. This, however, seems to be the wrong result as we want (3-b) to be ruled in and not (3-a). Since we have another structure to test – that is, binding – we expect that the binding option must be such that we cannot leave the F-mark off the pronoun. It turns out that this is the case.

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<sup>3</sup>I will not discuss below whether the F-mark on the subject could be dropped. The answer is that it cannot be dropped. To see this, consider the option under discussion without focus on the subject. In this case it would be required that the proposition *Bill likes Bill's mother* is given. This is clearly not the case, as neither *John likes Bill's mother* nor  $\exists x[x \text{ likes } \textit{Bill's mother}]$  entails it. Parallel considerations apply to all examples to be discussed below.

**Option 2: binding** Assume that the LFs for the binding option are as in (9). Moreover, for completeness, assume that  $g(2) = \text{Jack}$ , although nothing said below will hinge on the interpretation of the variable.

- (9) a. John likes Bill's mother  
 b.  $BILL_F$   $2[t_2 \text{ likes } 2_{(F)}\text{'s mother}]$

If focus is left off the pronoun, we get multiple violations of givenness. These are listed in (10). In each case it is impossible to find a suitable antecedent such that its existentially type shifted meaning would entail the existential F-closure of the focus constituent.<sup>4</sup>

- (10) *Non-given constituents*
- a.  $[BILL_F 2[t_2 \text{ likes } 2\text{'s mother}]]$ :  
     John likes Bill's mother  $\neg$ entails  $\exists x[x \text{ likes } x\text{'s mother}]$   
      $\exists x[x \text{ likes Bill's mother}] \neg$ entails  $\exists x[x \text{ likes } x\text{'s mother}]$
- b.  $[2[t_2 \text{ likes } 2\text{'s mother}]]$ :  
     John likes Bill's mother  $\neg$ entails  $\exists y[y \text{ likes } y\text{'s mother}]$   
      $\exists x[x \text{ likes Bill's mother}] \neg$ entails  $\exists y[y \text{ likes } y\text{'s mother}]$
- c.  $[2\text{'s mother}]$ : John likes Bill's mother  $\neg$ entails  $\exists P[P(\text{Jack's mother})]$   
      $\exists x[x \text{ likes Bill's mother}] \neg$ entails  $\exists P[P(\text{Jack's mother})]$   
      $\exists P[P(\text{Bill's mother})] \neg$ entails  $\exists P[P(\text{Jack's mother})]$

This means that the option without focus on the bound pronoun is not licensed by the theory of givenness. What about the version with focus on the pronoun? In this case givenness is satisfied. In order to see why, just notice that by putting an F-mark on the bound pronoun, we have gotten rid of the requirement that some constituent entails that someone likes his own mother. In other words, it is now for instance required that some constituent entails  $\exists x.\exists y[x \text{ likes } y\text{'s mother}]$ . And *John likes Bill's mother* does entail this. It moreover entails that there is a property holding of someone's mother, as required by the existential F-closure of the non-F-marked constituent  $[2_F\text{'s mother}]$ .

This means that if the binding option is chosen, the obligatory F-marking of the pronoun in the continuation of (3) becomes clear. The only question remaining is why coreference should not be an option. After all proper names are referring expressions, and therefore binding should not be the only possibility. In other words, givenness makes the right predictions if we find a reason why binding must be used instead of coreference. We do not have to look far for an answer. I will suggest that the use of contrastive *but* has this consequence.

## 2.2 *but* requires contrastiveness

Intuitively, the reason why binding is chosen is that the use of contrastive *but* in (3), repeated as (11), requires that the antecedent sentence somehow contrasts with the focus sentence.

<sup>4</sup>Note that the non-givenness of the constituent  $[2\text{'s mother}]$  depends on the particular choice for  $g(2)$ . But even if  $g(2)$  were actually given, the non-givenness of the other two constituents would be problematic enough anyway.

- (11) John likes Bill's mother, but ...  
 a. #BILL likes his mother  
 b. BILL likes HIS mother

The question is how contrastiveness is to be defined. This has been a long-standing question in the literature. For reasons of space we cannot go into a full discussion of this issue. But it has often been assumed that contrastiveness is best addressed by the use of focus values (cf. Büring (2008) a.o.). If one follows this line, one could assume that *but* has the presupposition in (12) introducing a condition of contrastiveness on the denotations of the VPs used (cf. Sæbø (2003) and Umbach (2005) a.o. for related proposals).<sup>5</sup> The focus value  $[[\phi]]^f$  for a given constituent  $\phi$  is the set of all alternatives to its ordinary denotation  $[[\phi]]^g$  of the same type, where the F-mark has been replaced by a variable of the appropriate type. See subsection 4.2 below for the definition of focus values and further discussion.<sup>6</sup>

- (12)  $[[IP_1 \text{ but } IP_2]] = [[IP_1 \text{ and } IP_2]]$   
 if  $[[VP_1]] \in [[VP_2]]^f$  and  $[[VP_1]] \neq [[VP_2]]$ , otherwise undefined.

The antecedent VP of (11) denotes the property  $\lambda x.x \text{ likes Bill's mother}$ . This, however, does not contrast with the VP of either (11-a) or (11-b) once we view the pronouns as being coreferential with the subject. The denotation of the VP in (11) is a member of the focus values of both the VPs in (11-a) and (11-b). But the denotations are equivalent in both cases. Therefore contrastiveness is not satisfied in this situation. If the binding option is used in the continuations in (11-a) and (11-b), however, the predicate denotes the property  $\lambda x.x \text{ likes } x's \text{ mother}$ . What is the focus value of the respective VPs? In case the pronoun is not focused, we obtain the singleton set in (13-a). The denotation of the antecedent VP is not a member of that set. I.e., contrastiveness is not licensed for this case. If, however, we choose to put an F-mark on the bound pronoun, the set in (13-b) obtains.<sup>7</sup> Moreover, the denotation of the antecedent VP is not identical to the binding VP. Thus the presupposition of contrastive *but* is satisfied if there is an F-mark on the bound pronoun. But notice that this is also the configuration favored according to givenness and AvoidF. In other words, the theory of givenness and the requirements imposed by *but* conspire to rule in only the continuation in (11-b).

<sup>5</sup>Note that Umbach (2005) distinguishes between focus and contrastive topic values in the sense of Büring (1997). In particular, the subject would be marked as a contrastive topic rather than as a focus. This is presumably correct, but what matters for the present discussion is how contrastiveness is defined. For this purpose values are needed that have sets as their denotations. Both focus values and contrastive topic values provide exactly this. There is more to be said about the correct lexical entry for *but*. But for our present purposes the one in (12) should suffice. The presupposition of *but* in (12) is similar to the one for adnominal *however* proposed by Sauerland (2000) with the difference that it does not require the subjects to contrast. The reason for this are cases such as (i). Thanks to an anonymous reviewer for EISS 8 for reminding me of cases such as (i), where the subjects do not contrast.

- (i) My children can't stand liver, but they do love chicken

<sup>6</sup>Note that it is not obvious how contrastiveness could be defined without the use of focus values. The notion of givenness does not have anything to say about contrastiveness.

<sup>7</sup>Note that the ordinary value of the VP – that is, the denotation of the binding configuration – is not a member of that set itself.

- (13) a.  $[[VP]]^f = \{\lambda x.x \text{ likes } x\text{'s mother}\}$   
 b.  $[[VP]]^f = \{\lambda x.x \text{ likes } y\text{'s mother} \mid y \in D_e\}$

At first it might seem that there is some redundancy in the system when we restrict ourselves to data such as (11). Both the theory of givenness and the requirements posed by *but* converge on the same solution. In particular, one might think that the correct definition of *but* is all that is needed. This is, however, not correct, as can be shown as follows: When *and* is used instead of *but*, the presuppositions of *but* disappear. As a consequence there should be no pressure to use the binding VP anymore. In particular, both binding and coreference should be options. But because of this focus on the pronoun and no focus should be equally felicitous, as the former is favored by givenness for binding, whereas the latter is favored for the coreference VP. This is confirmed by (14).

- (14) John likes Bill's mother, and ...  
 a.  $BILL_F$  likes  $HIS_F$  mother  
 b.  $BILL_F$  likes his mother

We observe that all of a sudden the focusing of the pronoun becomes optional. That this optionality is the consequence of having two independent structures at disposal – that is, coreference and binding – is shown by (15). Here binding is not an option and the possibility of leaving the F-mark off *John* is not there. This is so because the VP in (15-b) violates givenness. The property of liking John's mother is not given. But the property of liking someone's mother is, which is why F-marking *John* produces a felicitous outcome. From this we conclude two things: First, our conjecture that (14-a) is the consequence of binding and (14-b) the one of coreference finds independent support. The optionality of focusing only appears in situations where two structural analyses are possible. Moreover, the theory of givenness together with *AvoidF* applies to the two possible structures independently. Second, if givenness is at stake in (14) and (15), it should also apply in (11). In other words, in addition to the correct definition of contrastive *but* the theory of givenness is needed.

- (15) John likes Bill's mother, and ...  
 a.  $BILL_F$  likes  $JOHN_F$ 's mother  
 b.  $\#BILL_F$  likes John's mother

This line of argumentation is further supported by (16). In case the antecedent VP is made up of a conjunction where one conjunct denotes the property of liking one's own mother and the other the one of liking Bill's mother, both the binding and the coreference option are ruled out. First, assume a further modification of the definition of *but*: All that is required by it is that one of the conjuncts in the antecedent VP contrasts with the one in the utterance VP. When we consider the binding option, there is an antecedent that contrasts with it. In particular, the property of liking Bill's mother contrasts with liking one's own mother. *AvoidF*, however, dictates that focus on the bound pronoun cannot be used because the property of liking one's own mother counts as given. The binding VP without focus on the bound pronoun, on the other hand, does not satisfy the definedness condition imposed by *but*. The focus value of this VP is just

the singleton set in (13-a). There is no antecedent denotation that is both a member of this set and is not identical to the ordinary value of the VP. What about the coreference option? This option is not licensed because there is no antecedent denotation that satisfies contrastiveness. In particular, the focus value of the coreference VP with an F-mark on the free pronoun is as in (13-b). The only antecedent denotation that is a member of it is the property of liking Bill's mother. But it is also identical to the ordinary value of the VP. Contrastiveness is not fulfilled. The same applies to the coreference option without F-mark on the free pronoun. If we just had the requirements of *but* at our disposal, the unacceptability of (16-a) and (16-b) could not be accounted for.

- (16) John likes his own mother and Bill's mother, but ...
- a. #BILL<sub>F</sub> likes HIS<sub>F</sub> mother
  - b. #BILL<sub>F</sub> likes his mother

So far a theory of givenness and in particular Schwarzschild's 1999 approach accompanied by a few assumptions about contrastiveness being introduced by *but* makes the right predictions. Let us now turn to another set of data which complicates the picture. In particular, the assumptions made about *but* will generate problems.

### 3 Contrastive focus on pronouns

This section presents a problem for theories of givenness, in particular the one formulated by Schwarzschild (1999) and discussed in the preceding section. Data with focus on pronouns suggest that a revision is necessary. The data are minimally different from the ones discussed in section 2. We will see that a minimal change – essentially the addition of negation – affects the predictions of the theory dramatically. On the basis of these data an argument can be made that the set of competitors considered by AvoidF needs to be enlarged. In the discussion below, I will not show for all the constituents whether they are given if it is obvious that they are. Rather, I will pick the ones where it is not immediately clear whether givenness holds and discuss them in detail.

#### 3.1 Adding negation

Consider (17), under the reading where the pronoun refers to Bill. When there is negation involved, focus on the pronoun is not allowed (17-a)-(17-b). The negation is necessarily focused. This suggests that focus on the negation satisfies the contrastiveness requirement introduced by contrastive *but*. Moreover the impossibility of focusing the pronoun in (17-b) reminds us of data like (2) that were used as an argument for the postulation of a condition that minimizes the number of foci as AvoidF does in Schwarzschild's 1999 theory. This leads us to expect that an account in terms of givenness should be possible. In other words, the treatment of (2) should extend to the case in (17).<sup>8</sup>

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<sup>8</sup>Stress on the pronoun *his* can be ameliorated under particular circumstances, namely if the stress on *Bill* is dropped – that is, if (i) is the sentence in question. But in this situation it seems that the sentence is not read as a continuation of *John likes Bill's mother* anymore. Rather an antecedent of the form *Bill*



- (17) John likes Bill's mother, but ...  
 a. BILL DOESN'T like his mother  
 b. #BILL DOESN'T like HIS mother

We will see, however, that (17) behaves differently from the data introduced in the preceding section and that a straightforward explanation using givenness and AvoidF is not available. Let us first see why the theory as sketched so far fails. We look, again, at the coreference and the binding options separately.

**Option 1: coreference** Again,  $g(1)$  refers to Bill. If the pronoun is referential and there is no F-mark on the pronoun (18), all the relevant constituents are given. The DP [*I's mother*] and the pronoun itself are trivially given. In the following  $t$  is a variable over functions of type  $\langle t, t \rangle$ :

(18) [ $BILL_F$  DOESN'T $_F$  like  $1$ 's mother]

(19) *Given constituents*

a. [ $BILL_F$  DOESN'T $_F$  like  $1$ 's mother]:

[John likes Bill's mother] entails  $\exists t. \exists x [t(x \text{ likes Bill's mother})]$

b. [ $DOESN'T_F$  like  $1$ 's mother]:

$\exists x [x \text{ likes Bill's mother}]$  entails  $\exists t. \exists x [t(x \text{ likes Bill's mother})]$

If there is an F-mark on the pronoun (20), givenness will be satisfied because having more foci makes givenness-licensing easier. It is sufficient to notice that in all existential F-closures where *Bill* is used in (19), *Bill* is replaced by an existentially bound variable. But  $\exists t. \exists x. \exists y [t(x \text{ likes } y\text{'s mother})]$  is, of course, given in that situation.

(20) [ $BILL_F$  DOESN'T $_F$  like  $1_F$ 's mother]

By AvoidF the F-mark on the pronoun is not licensed in this situation. This means that under the coreference option (17-a) should be preferred to (17-b), i.e., the pattern in (17) is explained. In that respect the new data differ from the data discussed in the previous section. As we have seen coreference is not an option there due to the contrastiveness requirement of *but*. Would contrastiveness be satisfied by (18)? The focus value for the VP in (18) is as in (21). The denotation of the VP in the antecedent is the property of liking Bill's mother. This can be taken to be a member of (21) if one assumes that the identity-function serves as an alternative to negation. In this case, the denotation of the antecedent VP would contrast with the one of the VP in (18). In other words, the felicitousness of (17-a) and the infelicity of (17-b) are predicted by the coreference option.

(21)  $[[VP_{(18)}]]^f = \{\lambda x. t(x \text{ likes Bill's mother}) \mid t \in D_{\langle t, t \rangle}\}$

*likes Mary's mother* is accommodated.

(i) Bill DOESN'T like HIS mother

We still have to consider the binding option. If the contrast in (17) is to be explained, this option should not rule in (17-b) either.

**Option 2: binding** For the binding option assume the LFs in (22), where  $g(2) = \text{Jack}$ , again. Note that negation is in the VP and the subject is QRed above it. This is necessary because we want the focus on negation to be licensed in order to let the VP contrast with the antecedent VP.

- (22) a. John likes Bill's mother  
 b.  $BILL_F 2[NOT_F t_2 \text{ likes } 2_{(F)} \text{ mother}]$

If there is no F-mark on the bound pronoun, no violation of givenness obtains except for the constituent *[2's mother]*, which is not given. Similar remarks as in footnote 4 apply with respect to its givenness. It is left out below therefore.

- (23) *Given constituents*  
 a.  $[BILL_F 2[NOT_F t_2 \text{ likes } 2's \text{ mother}]]$ :  
     [John likes Bill's mother] entails  $\exists t. \exists x[t(x \text{ likes } x's \text{ mother})]$   
      $\exists x[x \text{ likes Bill's mother}]$  entails  $\exists t. \exists x[t(x \text{ likes } x's \text{ mother})]$   
 b.  $[2[NOT_F t_2 \text{ likes } 2's \text{ mother}]]$ :  
     [John likes Bill's mother] entails  $\exists t. \exists x[t(x \text{ likes } x's \text{ mother})]$   
      $\exists x[x \text{ likes Bill's mother}]$  entails  $\exists t. \exists x[t(x \text{ likes } x's \text{ mother})]$

As with the data in section 2, if we get rid of the offending bound pronoun in the existential F-closures considered by focusing it, givenness is again satisfied. In particular, the existential F-closure of both the IP and the VP is given because *John likes Bill's mother* entails  $\exists t. \exists x. \exists y[t(x \text{ likes } y's \text{ mother})]$ . By AvoidF, however, the bound pronoun should not be focused, as less F-marks are preferred. The remaining question is whether this option satisfies the requirements imposed by contrastive *but*. The focus value of the VP in (22-b) without F-mark on the bound pronoun is as in (24). The property denoted by the antecedent VP – that is, the property of liking Bill's mother – is not a member of (24). I.e., the contrastiveness requirement is not satisfied if we choose to leave the F-mark off the bound pronoun.

- (24)  $[[VP_{(22-b)}]]^f = \{\lambda x. t(x \text{ likes } x's \text{ mother}) \mid y \in D_e, t \in D_{\langle t, t \rangle}\}$

When we consider the option for the VP with F-mark, the focus value in (25) obtains. This time the denotation of the antecedent VP is a member of (25), provided again that the identity function is an alternative to negation. Moreover, the antecedent denotation is not identical to the ordinary value of the VP in (22-b). Therefore the contrastiveness requirement is satisfied by the VP with an F-mark on the bound pronoun.

- (25)  $[[VP_{(22-b)}]]^f = \{\lambda x. t(x \text{ likes } y's \text{ mother}) \mid y \in D_e, t \in D_{\langle t, t \rangle}\}$

But this means that the binding option would actually dictate the use of (17-b) over (17-a), because without focus on the pronoun contrastiveness is not satisfied. Note that AvoidF would not block the F-mark on the bound pronoun. It is an economy condition. As such it only applies if no other condition is violated. In the present case the

contrastiveness condition is violated. Therefore the option satisfying both givenness and contrastiveness must be chosen. This, however, is the one with an F-mark on the bound pronoun. This moreover suggests that the coreference option is used for the continuation in (17). As we will see momentarily, it is not clear, however, why the binding option and therefore focus on the pronoun is not licensed. From what we have seen so far, we expect optionality of focus on the pronoun.

### 3.2 The puzzle

To summarize: Remember that for the data in section 2 we said that the contrastiveness requirement of *but* requires the use of the binding option. Binding in turn required the use of an F-mark on the pronoun by givenness. This explained the pattern in (3) repeated as (26). In the data of the present section, (17) repeated as (27), on the other hand, the F-mark on the pronoun is prohibited. Given what we just saw, this means that the coreference option is chosen in this case. This explains the pattern.

- (26) John likes Bill's mother, but ...  
 a. #BILL likes his mother  
 b. BILL likes HIS mother
- (27) John likes Bill's mother, but ...  
 a. BILL DOESN'T like his mother  
 b. #BILL DOESN'T like HIS mother

The problem with this account is that one would expect (27-b) to be an option under the reasoning from above. In particular, the binding option should rule in (27-b). We have seen that in this case the bound pronoun must be F-marked. Otherwise a violation of the contrastiveness condition would incur. Only if the pronoun is stressed, the contrastiveness requirement is also fulfilled in that situation. Again, *AvoidF* does not apply in this situation because only the less economical option with an F-mark satisfies both givenness and contrastiveness. Thus nothing blocks (27-b) from surfacing.

Intuitively speaking the problem in (27-b) seems to be that there are too many foci. This means that *AvoidF* should rule it out. Recall that it is the coreference structure without F-mark on the pronoun in (28-a) that rules out the coreference version with F-mark on the pronoun in (28-b) because givenness checking does not lead to any violations of givenness in either of them.

- (28) a. BILL<sub>F</sub> NOT<sub>F</sub> likes 3's mother  
 b. BILL<sub>F</sub> NOT<sub>F</sub> likes 3<sub>F</sub>'s mother

But there is no way that (28-a) can rule out the binding structure in (29), which has focus on the pronoun. This is because givenness compares identical structures that only differ in the presence or absence of an F-mark. But (29) differs from (28-a) in having a QRed subject and a binder co-indexed with the pronominal variable.<sup>9</sup> Moreover

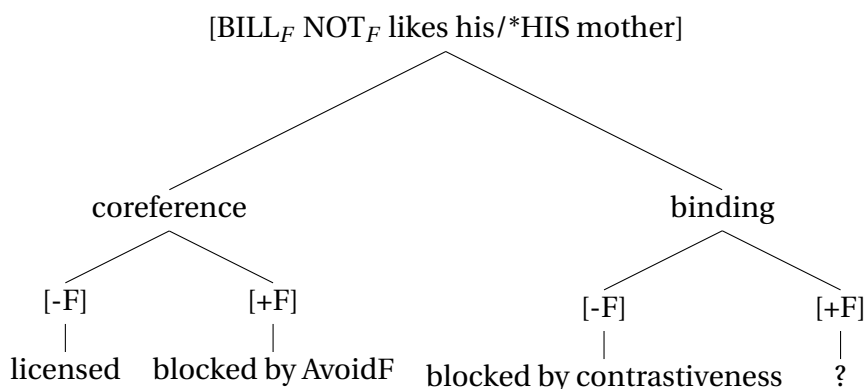
<sup>9</sup>Note that one cannot claim that the binding option simply does not exist because binding is needed to explain the data from section 2. Otherwise (26-a) would be preferred over (26-b). Moreover, if anything, one would expect following Reinhart (1983), Heim (1998) a.o. that the binding option is preferred if both binding and coreference are possible. In any case, if one is to defend that the coreference option

binding without F-mark cannot rule (29) out either because it is not even licensed by contrastiveness.

(29) BILL<sub>F</sub> 2[NOT<sub>F</sub> t<sub>2</sub> likes 2<sub>F</sub>'s mother]

The nature of the problem can therefore be characterized as follows:

(30) *Nature of the problem*  
Coreference<sub>[-F]</sub> cannot block binding<sub>[+F]</sub> by AvoidF because coreference and binding employ different structures:



Intuitively, in order to achieve the correct distribution of F-marking, we want to find a way to let (28-a) not only block (28-b), but also (29). That means that the set of competitors considered by our theory must be expanded. In the following section I propose a solution that does exactly this in order to deal with this transderivational dilemma.

But before going on we have to be sure that the effect we are observing in (27) is not of a more general sort; that is, is it ever possible or necessary to stress part of the VP when negation and contrastive *but* are involved? Consider (31) and its possible continuations. It seems that we find a preference for F-marking *John* in this situation. It is clear why *John* in (31-a) is F-marked: The property of liking John's mother is not given in the present discourse. (31-b) might not be completely out as a continuation to (31), but it is definitely disfavored compared to (31-a). This is as expected because the property of liking John's mother is not given in the discourse.

(31) John likes Bill's mother, but ...  
a. BILL DOESN'T like JOHN's mother  
b. ?BILL DOESN'T like John's mother

The reason why the judgements regarding (31-b) are a little delicate, I suspect, is as follows: In a situation where we are talking about the individuals John and Bill and their respective mothers, the utterance of (31) might give rise to an expectation that each one likes the other's mother. In other words, (31) could give rise to the additional implicated antecedent *Bill likes John's mother*. In this sense, the property of liking John's

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is the one that is used in (27-a), it must be claimed that the preference of binding over coreference is overridden by an additional requirement, the requirement being givenness. Presumably this is no problem, as the preference of binding over coreference has the status of a rider that can be voided if need be, anyway.

mother could count as given and *John* would not have to be F-marked. Note that such an additional antecedent might also be available for (26) and (27). But in neither case do the continuations make use of that antecedent. Therefore, only the overt linguistic antecedent material matters for givenness calculation. At any rate, (31) shows that F-marking part of the VP is possible when negation and contrastive *but* are used. Therefore the puzzle discussed above cannot be reduced to independent factors.<sup>10</sup>

## 4 Focus values redux

In the present section I implement givenness by employing focus values and I argue for a modified version of AvoidF. AvoidF is replaced by MP! that essentially reduces the size of focus values.

### 4.1 Informal presentation of the idea

Recall the nature of the puzzle from subsection 3.2: We want a structure without F-mark to block a *different* structure that has an F-mark. But this is impossible with a condition that compares parallel structures that only differ in F-marking. A natural way to circumvent this problem is to try to capitalize on semantic values because in principle two different structures can yield the same semantic value. This is especially true for structures that allow both coreference and binding. Consider (32). It does not matter for the meaning whether the underlying structure is (33-a-i) or (33-a-ii), as long as  $g(3)$  maps onto John. If the latter holds, the semantic values are identical (33-b).

(32) John finished his dissertation

- (33) a. (i) John finished 3's dissertation  
 (ii) John  $2[t_2]$  finished 2's dissertation  
 b.  $[[\text{(33-a-i)}]] = [[\text{(33-a-ii)}]] = \text{John finished John's dissertation}$

<sup>10</sup>Irene Heim (p.c.) notes that in the discourse in (i) focusing *patricide* is infelicitous. First, we have to see whether givenness is satisfied for the VPs in (i-a) and (i-b), respectively. The existential F-closure of the former is  $\exists x[t(x \text{ commits patricide})]$ . The property denoted by the antecedent VP is *killing Bill's father*. Its existential closure, however, does not entail the existential F-closure. Moreover, the constituent *[patricide]* is crucially not given, either. The existential F-closure for the VP in (i-b), on the other hand, is  $\exists x.\exists y[t(x \text{ commits } y)]$ . It can be argued that this constituent is given because the property denoted by the antecedent VP – that is, *killing Bill's father* – entails committing murder. But then it is unclear why (i-b) is infelicitous, whereas (i-a) is felicitous. The only way to address the infelicity of (i-b) is to assume that *commit patricide* can either have a bound variable or a coreference structure. In the latter case what needs to be given is that someone killed Bill's father. The discourse guarantees this. (i-b), on the other hand, would have to have the binding configuration as underlying structure. Only focusing the underlying bound variable, which surfaces as focus on *patricide*, obeys givenness. If this is assumed, the pattern in (i) becomes parallel to the one in (27) in the text, and the solution to the latter should extend to the former.

- (i) John killed Bill's father, but ...  
 a. BILL DIDN'T commit patricide  
 b. #BILL DIDN'T commit PATRICIDE

Assume we have on the one hand focus values in our system and a condition on focus licensing more or less similar to Rooth's 1992 one, i.e., there must be an antecedent whose ordinary semantic value is a subset/member of the focus value of the focus constituent. Given the discussion from subsection 3.2, on the other hand, we also need something that lets the coreference structure without focus block the binding option with focus. So assume moreover that there is a condition that says: The smaller the size of a focus value, the better. In particular, (34-a) and (34-b) have the same ordinary semantic value if  $g(3)$  maps onto Bill. So in principle both could be used as continuations in the example discussed in the previous section. But I will show that the focus value of a coreference structure without focus on the pronoun has a smaller focus value than both the coreference structure with focus and the binding structure with focus. The condition that reduces the size of focus values therefore prefers the former to the latter two.

- (34) a.  $BILL_F$   $NOT_F$  likes  $3_F$ 's mother  
 b.  $BILL_F$  2[ $NOT_F$  likes  $2_F$ 's mother]

The binding structure without focus, however, is shown to not conform to the first condition – that is, Rooth's focus condition. In other words, there is no appropriate antecedent for such a structure. In addition it also does not satisfy the contrastiveness requirement, as we already know. Let us now turn to a more detailed outline of this idea.

## 4.2 The system

I will now introduce the assumptions made in order to account for the data discussed in the present paper. Remember that we are assuming Rooth's 1985 theory of focus, where an F-mark on a constituent makes alternative meanings of the same type as the constituent available. This is formalized by having two semantic values in the system, an ordinary semantic value and a focus value. The latter corresponds to the set of alternative meanings for the ordinary meaning an F-marked constituent. In other words F-marks introduce alternatives. Thus we have the following interpretive rules:

- (35) *Semantic values*
- a. (i)  $[[A_{F,\sigma}]] = A$   
 (ii)  $[[A_{F,\sigma}]]^f = D_\sigma$   
 b. (i)  $[[A_\sigma]] = A$   
 (ii)  $[[A_\sigma]]^f = \{[[A_\sigma]]\}$

Following Hamblin (1973) and Rooth (1985) the rule of functional application can be defined as in (36) when dealing with sets, as is necessary in the case of focus values. I assume that the rule in (36) is only necessary for the computation of focus values. In other words, ordinary values do not correspond to sets.

- (36) *Functional application*  
 Given branching node A with daughters B of type  $\langle\sigma\tau\rangle$  and C of type  $\langle\sigma\rangle$ ,  $[[A]]^f = \{f(x) \in D_\tau : f \in [[B]]^f \text{ and } x \in [[C]]^f\}$ .

Moreover, the theory makes use of the  $\sim$ -operator which interprets foci. The semantic contribution of the operator is given in (37). It adds the presupposition that the contextually relevant alternatives  $g(C)$  form a subset of the focus value of the sister constituent of the  $\sim$ -operator. In addition it resets the focus value to the ordinary value of its sister (cf. Rooth (1992) and Beck (2006)). In short (contrastive) focus is licensed if the ordinary value of the antecedent is a member/subset of the focus value considered. We refer to this as the *focus principle*. Furthermore I assume for concreteness that each sentential node has  $\sim$  adjoined to it. This has the effect that focus must be necessarily evaluated at the sentential level. Further  $\sim$ -operators are optional.

- (37) a.  $[[[X \sim C [Y \dots]]]] = [[Y \dots]]$   
           if  $g(C) \subseteq [[Y \dots]]^f$ , otherwise undefined  
       b.  $[[[X \sim C [Y \dots]]]]^f = [[Y \dots]]$

I will now introduce a new way of looking at AvoidF. In particular following Truckenbrodt (1995), I argue that it should be replaced by MP!. Truckenbrodt refers to this as *Maximize background*. MP! as a principle is introduced by Heim (1991). MP! is a condition which says that if there are alternatives  $\phi$  and  $\psi$  conveying the same truth conditional information such that both satisfy the conditions imposed by the context, the alternative with the strongest requirement on the context has to be chosen. Heim motivates this condition by observing a competition in the use of the indefinite and definite articles following Hawkins (1981). The indefinite article cannot be used to modify a predicate in situations where it is already known that the predicate is only satisfied by one individual. It is assumed that the definite and the indefinite articles form lexical alternatives for purposes of MP!. Since an analysis of the definite article is assumed where the uniqueness of the modified predicate is presupposed, the definite article must be used in such situations. Consider (38). A car usually has only one engine. Both the indefinite article in (38-a) and the definite article in (38-b) could be used to convey the same information. But the definite article places a stronger requirement on the context due to the added uniqueness presupposition. By MP! it is preferred.

- (38) a. #An engine of my car broke  
       b. The engine of my car broke

We can use MP! to do the job of AvoidF.<sup>11</sup> In particular, one can think of utterances as being split into focused and backgrounded material (cf. Stechow (1990) and Krifka (1992) a.o.). In Rooth's theory it is natural to extend this view to parts of utterances – that is, to focus domains (FD). Assume that FD is defined as in (39). MP! can be defined as in (40).  $\phi$  and  $\psi$  in the discussion below will correspond to different choices for the values of FD.

<sup>11</sup>In what follows I will assume that MP! only regulates the position of F-marks inside a focus domain. In Truckenbrodt's 1995 theory it is also the establishment of the focus domain itself that is regulated by MP!, i.e., the attachment site of  $\sim$  is subject to MP! as well. This is presumably the correct way to think about it. But since we are assuming that the sentential level has an obligatory  $\sim$  adjoined anyway, and since the data discussed in this section do not make it necessary to establish smaller focus domains, I will proceed as if MP! had nothing to say about the attachment site of  $\sim$ .

- (39) *Focus Domain*  
A focus domain corresponds to the scope of a  $\sim$ -operator.
- (40) *Maximize Presupposition*  
Given alternatives  $\phi$  and  $\psi$  such that  $\phi$  and  $\psi$  convey the same truth-conditional information, choose the one with the strongest requirement on the context possible.

Let us now turn to the application of the theory to the puzzling data discussed in the previous section.

### 4.3 Explanation of data

Let me first repeat the crucial data once more:

- (41) John likes Bill's mother, but ...  
a. BILL DOESN'T like his mother  
b. #BILL DOESN'T like HIS mother

I will now show that the system introduced in the previous subsection accounts for the obligatory absence of focus on the pronoun in (41). The LFs we have to consider are the ones given in (42), i.e., both the coreference and the binding option with and without focus on the pronoun, respectively. The value of  $g(2)$  is immaterial for the present discussion since we are only considering the semantic values of the whole IPs. In each case the  $\sim$ -operator is coindexed with the antecedent sentence in (41).

- (42) a. (i)  $[_{CP} \sim C [_{IP} \text{BILL}_F \text{NOT}_F \text{likes his mother}]]$   
(ii)  $[_{CP} \sim C [_{IP} \text{BILL}_F \text{NOT}_F \text{likes his}_F \text{mother}]]$   
b. (i)  $[_{CP} \sim C [_{IP} \text{BILL}_F 2 [_{VP} \text{NOT}_F t_2 \text{likes 2's mother}]]]$   
(ii)  $[_{CP} \sim C [_{IP} \text{BILL}_F 2 [_{VP} \text{NOT}_F t_2 \text{likes } 2_F \text{'s mother}]]]$

First, note that all of the options have the same ordinary semantic value. This means that MP! as defined can apply. MP! compares alternatives with the same truth-conditional contribution and chooses the one with the strongest requirement on the context. So the question is which one of the options in (42) makes the strongest requirement:

- (43)  $[[ (42) ]] = \lambda w. \neg \text{Bill likes Bill's mother in } w$

The focus value for the IP in the coreference option without F-mark on the pronoun – that is, for (42-a-i) – is given in (44). As there is no F-mark on the pronoun, no alternatives are introduced for the individual denoted by the pronoun. The focus value is the set of propositions of the form  $x$  likes Bill's mother,  $x$  an individual, with a function of type  $\langle st, st \rangle$  applied to it. Notice moreover that I am treating the identity map (ID) as an alternative to negation, again.

- (44)  $[[ \text{IP}_{(42-a-i)} ]]^f = \{ t(\lambda w. x \text{ likes Bill's mother in } w) \mid x \in D_e, t \in D_{\langle st, st \rangle} \}$

Consider now the focus values of the IPs of the coreference option and the binding option – where both exhibit an F-mark on the pronoun – (42-a-ii) and (42-b-ii) respectively. The two focus values are identical. Since the F-mark on the pronoun intro-



duces alternatives for the pronoun, the difference between binding and coreference becomes superfluous. The focus value is now the set of propositions of the form *x liked y's mother* with a function of type  $\langle st, st \rangle$  applied to it.

$$(45) \quad [[\text{IP}_{(42\text{-a-ii})}]^f] = [[\text{IP}_{(42\text{-b-ii})}]^f] = \{t(\lambda w.x \text{ likes } y\text{'s mother in } w) \mid x, y \in D_e, t \in D_{\langle st, st \rangle}\}$$

Now we have to check which ones of the focus values considered so far satisfy the focus principle. I.e., it has to be seen whether the ordinary value of the antecedent sentence is a member of the focus values or not. The ordinary value of the relevant antecedent is obviously as follows:

$$(46) \quad [[\text{IP}_{\text{antecedent}}]] = \lambda w.\text{John likes Bill's mother in } w$$

It turns out that the focus principle would be satisfied by all of the focus values above, i.e., (46) is a member of all of the focus values above. Given that all three options would in principle be possible focus values given the antecedent, and given that we have seen that all structures under consideration share their denotation, MP! will determine which focus value is to be chosen. It turns out that the focus value of the coreference option without F-mark is a proper subset of both focus values with an F-mark, as stated in (47). Thus the former option is strictly stronger than the latter two, which means that it places a stronger requirement on the context. Thereby it blocks both options with a focus on the pronoun, i.e., the focus values of the structures with F-mark on the pronoun are simply too large, and thus they are uneconomical.

$$(47) \quad \{t(\lambda w.x \text{ likes Bill's mother in } w) \mid x \in D_e, t \in D_{\langle st, st \rangle}\} \subset \{t(\lambda w.x \text{ likes } y\text{'s mother in } w) \mid x, y \in D_e, t \in D_{\langle st, st \rangle}\}$$

Remember that we are assuming that in addition to the obligatory  $\sim$ -operator attached to the sentential level, further embedded  $\sim$ -operators are optional and sometimes necessary (cf. Rooth (1992) and the discussion in Mayr (to appear)). The question is whether these additional LFs would not actually license the infelicitous (41-b). This means that at least the following structures have to be considered possible LFs.<sup>12</sup>

$$(48) \quad \begin{array}{ll} \text{a.} & \text{(i) } [\text{CP} \sim \text{C} [\text{IP} \text{BILL}_F [\sim \text{C} [\text{VP} 2[\text{NOT}_F t_2 \text{ likes his mother}]]]]] \\ & \text{(ii) } [\text{CP} \sim \text{C} [\text{IP} \text{BILL}_F [\sim \text{C} [\text{VP} 2[\text{NOT}_F \text{ likes his}_F \text{ mother}]]]]] \\ \text{b.} & \text{(i) } [\text{CP} \sim \text{C} [\text{IP} \text{BILL}_F [\sim \text{C} [\text{VP} 2[\text{NOT}_F t_2 \text{ likes } 2\text{'s mother}]]]]] \\ & \text{(ii) } [\text{CP} \sim \text{C} [\text{IP} \text{BILL}_F 2 [\sim \text{C} [\text{VP} 2[\text{NOT}_F t_2 \text{ likes } 2_F\text{'s mother}]]]]] \end{array}$$

There are no significant differences to the cases considered above, however. Again, the focus value of the VP in (48-a-i) – that is, (49-a) – is the strongest requirement that can be placed on the context. The ordinary value of the antecedent VP is a member of that value. Moreover, (49-a) is strictly stronger than the focus value for both options with an F-mark on the pronoun given in (49-b). Thus MP! prefers the former focus value. (48-b-i) is again ruled out as structure because there is no binding relation in the antecedent VP. Thus the focus principle could never be satisfied. This means our

<sup>12</sup>Note that the attachment sites of  $\sim$  might also be regulated by MP! as discussed in footnote 11 above. Let us nevertheless see what the outcome is if this option is ignored, i.e., if we proceed as if the positioning of  $\sim$  were not conditioned by MP!.

theory makes the correct predictions concerning the data we set out to derive.

- (49) a.  $[[VP_{(48-a-i)}]]^f = \{\lambda x.\lambda w.t(x \text{ likes Bill's mother in } w) \mid t \in D_{\langle st, st \rangle}\}$   
 b.  $[[VP_{(48-a-ii)}]]^f = [[VP_{(48-b-ii)}]]^f = \{\lambda x.\lambda w.t(x \text{ likes } y\text{'s mother in } w) \mid y \in D_e, t \in D_{\langle st, st \rangle}\}$

What remains to be shown is that the binding structure without focus on the pronoun (42-b-i) is ruled out by our system. First remember that this option is already blocked by the fact that the contrastiveness requirement is not satisfied by the VP used. This was the very reason why the puzzle in the preceding section arose. But in addition – in contrast to Schwarzschild’s 1999 system – there is another reason why this option cannot surface. Consider the focus value for the corresponding IP. It can be seen that the ordinary semantic value of the antecedent IP (46) is not a member of (50). Therefore, in addition to the violation of contrastiveness, the focus principle is not satisfied by (42-b-i) either.

- (50) a.  $[[IP_{(42-b-i)}]]^f = \{t(\lambda w.x \text{ likes } x\text{'s mother in } w) \mid x \in D_e, t \in D_{\langle st, st \rangle}\}$

Let us also briefly reconsider the data from subsection 2.1 above, which were used to introduce Schwarzschild’s system. First recall the data:

- (51) John likes Bill’s mother, but ...  
 a. #BILL<sub>F</sub> likes his mother  
 b. BILL<sub>F</sub> likes HIS<sub>F</sub> mother

From our considerations regarding the contrastiveness requirement of contrastive *but* we already know that coreference as a whole is ruled out in this situation. Coreference, both with focus and without focus on the pronoun, is not available because the VPs do not contrast. Therefore we only have to consider the binding options in (52).

- (52) a.  $[_{CP} \sim C [_{IP} \text{ Bill}_F 1 [_{VP} t_1 \text{ likes } 1\text{'s mother}]]]$   
 b.  $[_{CP} \sim C [_{IP} \text{ Bill}_F 1 [_{VP} t_1 \text{ likes } 1_F\text{'s mother}]]]$

The ordinary semantic value of the antecedent is not a subset of the focus value in (53-a) – that is, of the focus value of the binding IP without F-mark on the pronoun. (52-a) therefore does not satisfy the focus principle and is blocked. The antecedent value is, however, a subset of the focus value for (52-b), which is given in (53-b). The focus principle is satisfied. Moreover remember that although the coreference option without F-mark on the pronoun would also satisfy FR – because its focus value would be  $\{\lambda w.x \text{ likes Bill's mother in } w \mid x \in D_e\}$  and the denotation of the antecedent is a member of that set – it does not block (52-b). As said above, a VP with a pronoun referring to Bill is never licensed, as it does not contrast with the antecedent VP. Therefore only (52-b) is licensed.

- (53) a.  $[[IP_{(52-a)}]]^f = \{\lambda w.x \text{ likes } x\text{'s mother in } w \mid x \in D_e\}$   
 b.  $[[IP_{(52-b)}]]^f = \{\lambda w.x \text{ likes } y\text{'s mother in } w \mid x, y \in D_e\}$

In the present section we have shown that the assumption that AvoidF is an instance of MP! directly accounts for data that proved to be problematic for Schwarzschild’s orig-

inal formulation of *AvoidF*. We have seen that we can account for the data, once we allow for comparison of focus values in the sense that smaller focus values are preferred by MP!. The reason is that MP! naturally expands the set of competitors when comparing alternatives for focus licensing. In the following section, further properties of the proposed system are discussed.

## 5 Replicating Schwarzschild's results

In the present section I will show how the predictions of Schwarzschild's 1999 system are replicated by the present proposal in terms of focus values combined with Truckenbrodt's 1995 suggestion to replace *AvoidF* with MP!. Recall that in Schwarzschild's 1999 theory givenness is the main force that drives F-marking of material. Let me briefly review the two conditions he proposes: First each non-F-marked constituent in a clause must be given, whereas F-marked constituents need not be given. This is condition (4) from section 2. To be given as an individual-denoting expression means that there is an antecedent constituent in the context whose denotation is coreferential with that expression. For expressions of all other types the existentially type shifted version of the denotation of some antecedent entails the existentially type shifted denotation of the non-F-marked constituent, where all F-marks are replaced by existentially bound variables. Second, Schwarzschild uses the condition *AvoidF* (6) that compares structures with and without F-mark and says that the one with the fewest F-marks satisfying givenness must be chosen.

The givenness condition (4) allows for given material to be F-marked, although it does not require it. Schwarzschild shows that this assumption is necessary. In (54), where the pronoun is coreferential to *John*, it is given as the context – the antecedent question – mentions *John*. Nevertheless the pronoun can and in fact must be focused.

- (54) {Who did John's mother praise?}  
 A: She praised [HIM]<sub>F</sub>  
 (Schwarzschild 1999:145)

Schwarzschild considers the F-markings  $A_1$ - $A_5$  in (54) as potential structures for the answer. The first one is the only possible one he argues.

- (55) Who did John's mother praise?  
 $A_1$ : She praised [HIM]<sub>F</sub>  
 $A_2$ : \*[She praised him]  
 $A_3$ : \*[SHE<sub>F</sub> praised him]  
 $A_4$ : \*[She PRAISED<sub>F</sub> him]  
 $A_5$ : \*She [[PRAISED]<sub>F</sub> him]<sub>F</sub>

Before showing how the present system accounts for the obligatory F-mark on the pronoun in (54), let us briefly discuss how Schwarzschild rules out all structures except for  $A_1$ . We will see that all other answers either violate givenness or *AvoidF*. In Schwarzschild's system we have to check whether each constituent that is not F-marked is given by the context. In the present case the context only contains the question. We assume Karttunen's 1977 semantics of questions. The existential type shift of the se-

semantic value of the question,  $\{p : \exists x[p = \text{John's mother praised } x]\}$ , is equivalent to  $\exists x[\text{John's mother praised } x]$  – that is, the existential type shift of the question is the disjunction of all the answers.<sup>13</sup> This is the antecedent for the answers for which we check givenness.

First consider the grammatical  $A_1$ . The pronoun *she* is coreferential with *John's mother* and *him* with *John*, i.e. both count as given. They are left out in (56). But (56) shows that also for all remaining non-F-marked constituents there is an existentially type shifted antecedent that entails the existential F-closure of that constituent.

(56) *Given constituents*

a. *[She praised [HIM]<sub>F</sub>]:*

$\exists x[\text{John's mother praised } x]$  entails  $\exists x[\text{John's mother praised } x]$

b. *[praised [HIM]<sub>F</sub>]:*  $\exists x[\text{John's mother praised } x]$  entails  $\exists x.\exists y[y \text{ praised } x]$

c. *[praised]:*  $\exists y[\text{John's mother praised } y]$  entails  $\exists x.\exists y[y \text{ praised } x]$

But why is the F-mark obligatory, i.e., why is AvoidF that pushes for less F-marks not violated? Consider the ungrammatical  $A_2$ . Since  $A_2$  is wholly non-F-marked, there should be antecedents that entail *John's mother praised John* and  $\exists x[x \text{ praised John}]$ , the existential F-closures of the IP and the VP, respectively. The existentially type shifted question does not entail this, however.  $A_3$  is ruled out for essentially the same reason. Since the subject is F-marked in this case, the existential F-closure of the IP and the VP collapse to  $\exists x[x \text{ praised John}]$ . As we have already seen during the discussion of  $A_2$ , this is not given.

The existential F-closure of the IP in  $A_4$ , on the other hand, is  $\exists R[R(\text{John's mother}, \text{John})]$ . But again, there is no antecedent that entails that there is some relation between John and John's mother.<sup>14</sup> The VP is not given either by any constituent. I leave the verification of this to the reader. When we consider  $A_5$ , we see that each non-F-marked constituent is given. In addition to the pronouns *she* and *him*, the whole IP counts as given (57). Note that the pronoun *him* itself is not F-marked, but it is dominated by an F-mark.<sup>15</sup>

(57) *[She [[PRAISED]<sub>F</sub> him]<sub>F</sub>]:*

$\exists x[\text{John's mother praised } x]$  entails  $\exists R[R(\text{John's mother})]$

But in this case AvoidF is violated because *[She [[PRAISED]<sub>F</sub> him]<sub>F</sub>*,  $A_5$ , has more F-marks than *[She praised [HIM]<sub>F</sub>]*,  $A_1$ . As both satisfy givenness, the latter is preferred. This is the desired outcome.

<sup>13</sup>See (Schwarzschild 1999:152) for an exact definition of existential type shift. For the present purposes it seems enough to intuitively grasp the main idea.

<sup>14</sup>See (Schwarzschild 1999:160 fn.5), where he claims that the expression *John's mother* might not entail that John has a relation to John's mother, but that it might rather be a presupposition. Moreover, he speculates that *R* might stand in for verbal predicates and that a nominal predicate might not be an instantiation for this variable. By this reasoning the givenness of *John's mother* does not entail that there is a relation between John and John's mother.

<sup>15</sup>Note that the F-marking indicated in  $A_5$  is argued to be possible by many works following Selkirk (1984) (also cf. Rochemont (1986)), where it is assumed that if a syntactic head is F-marked, then this F-mark can project to the phrase level. Moreover F-marking of an internal argument licenses an F-mark on the head selecting for the internal argument (see Selkirk (1996)).

Let us now see whether the present theory can replicate Schwarzschild's results. We assume that the potential LFs are as in (55) above with the only difference that a  $\sim$ -operator together with a contextually determined set of alternatives is adjoined to each answer. Recall once more that the ordinary semantic value of the antecedent question is  $\{p : \exists x[p = \lambda w. \text{John's mother praised } x \text{ in } w]\}$ . The focus value of  $A_1$  is (58). The question denotation is necessarily a subset of (58), i.e., the focus principle is satisfied.

$$(58) \quad [[A_1]]^f = \{\lambda w. \text{John's mother praised } x \text{ in } w \mid x \in D_e\}$$

Consider answer  $A_2$ , which has the focus value in (59). The denotation of the question is not a subset of  $[[A_2]]^f$ . It could only be so if the set of answers were only a singleton. Thus FR is not satisfied by  $A_2$ .<sup>16</sup>

$$(59) \quad [[A_2]]^f = \{\lambda w. \text{John's mother praised John in } w\}$$

Answer  $A_3$ , on the other hand, denotes the set of propositions where different people praise John. Clearly, the denotation of the antecedent question is not a subset of this focus value either, i.e.,  $A_3$  does not satisfy the focus principle:

$$(60) \quad [[A_3]]^f = \{\lambda w. x \text{ praised John in } w \mid x \in D_e\}$$

$A_4$  is ruled out for similar reasons as  $A_3$ . The question denotation cannot be a subset of the possible relations holding between John's mother and John:

$$(61) \quad [[A_4]]^f = \{P(\text{John's mother}, \text{John}) \mid P \in D_{\langle e, st \rangle}\}$$

Consider now  $A_5$ . Its focus value denotes John's mother's potential properties:

$$(62) \quad [[A_5]]^f = \{P(\text{John's mother}) \mid P \in D_{\langle e, st \rangle}\}$$

Notice that the F-mark on the verb does not contribute to this focus value at all.  $A_5$ , too, is ruled out by our considerations. In Schwarzschild's account it was blocked by AvoidF. In other words, there is a more economical version than  $A_5$ . This also holds for the modified account where MP! takes its place. In particular, the set in (58), the focus value of  $A_1$ , is a proper subset of (62). As we have seen, (58) is licensed. Thus MP! prefers  $A_1$  over  $A_5$ .

We have thus carried over Schwarzschild's explanation for the intriguing question-answer data. Notice that in the new account it suffices to check whether the ordinary value of the antecedent sentence is a subset of the focus value of the whole focus utterance. We have not felt the need to apply this checking to any subconstituents of the latter as in Schwarzschild's account.

<sup>16</sup>In case questions denote the set of true answers, instead of possible answers, as proposed by Karttunen (1977), it could happen that the semantic value of the antecedent is a subset of  $[[A_2]]^f$ . I am following Hamblin (1973) and other work more closely in assuming that the denotation of a question is the set of possible answers. In particular see Beck and Rullmann (1999) for arguments that this is the correct approach.

## 6 Conclusion

In the present paper I have advanced the following claim: The competitor set necessary for focus licensing must be enlarged. In particular, it was suggested that if two structures share their denotation, then they are both equally relevant for focus licensing. It was shown that this is a direct prediction of the theory advocated by Truckenbrodt (1995) whereby AvoidF should be seen as an instance of MP!. The second contribution I hope to have made is to have shown that Schwarzschild's 1999 insight that structures without F-marks are more economical than ones with can be easily incorporated into a system making use of focus values.

## References

- Beck, Sigrid, 2006. Intervention effects follow from focus interpretation. *Natural Language Semantics*, 14:1–56.
- Beck, Sigrid and Hotze Rullmann, 1999. A flexible approach to exhaustivity in questions. *Natural Language Semantics*, 7:249–298.
- Büring, Daniel, 1997. *The Meaning of Topic and Focus: The 59th Street Bridge Accent*. London, New York: Routledge.
- Büring, Daniel, 2008. What's new and (what's given) in the theory of focus? In *Proceedings of the Berkeley Linguistics Society Meeting 2008*. Berkeley, California.
- Hamblin, Charles, 1973. Questions in Montague grammar. *Foundations of Language*, 10:41–53.
- Hawkins, John A., 1981. *Definiteness and Indefiniteness: A Study in Reference and Grammaticality Prediction*. London: Croom Helm.
- Heim, Irene, 1991. Artikel und Definitheit. In Stechow, Arnim von and Dieter Wunderlich (eds.), *Semantik: Ein internationales Handbuch der zeitgenössischen Forschung*, pp. 487–535. Berlin: de Gruyter.
- , 1998. Anaphora and semantic interpretation: A reinterpretation of Reinhart's approach. In Percus, Orin and Uli Sauerland (eds.), *The Interpretive Tract(25)*, pp. 205–246. Cambridge, Massachusetts: MIT, Department of Linguistics.
- Karttunen, L., 1977. Syntax and semantics of questions. *Linguistics and Philosophy*, 1:3–44.
- Kratzer, Angelika, 1991. The representation of focus. In Stechow, Arnim von and Dieter Wunderlich (eds.), *Semantics: An international handbook of contemporary research*, pp. 825–834. Berlin: Walter de Gruyter.
- Krifka, Manfred, 1992. A compositional semantics for multiple focus constructions. *Linguistische Berichte*, pp. 17–53.

- Mayr, Clemens, to appear. Resetting alternatives: Focus on bound pronouns. In Li, Nan and David Lutz (eds.), *Proceedings of SALT 20*.
- Reinhart, Tanya, 1983. *Anaphora and Semantic Interpretation*. Chicago, Illinois: University of Chicago Press.
- Rochemont, Michael, 1986. *Focus in generative grammar*. Amsterdam, The Netherlands: John Benjamins Publishing Company.
- Rooth, Mats, 1985. *Association with Focus*. Ph.D. thesis, University of Massachusetts, Amherst.
- , 1992. A theory of focus interpretation. *Natural Language Semantics*, 1:75–116.
- Sæbø, Kjell Johan, 2003. Presupposition and contrast: German *aber* as a topic particle. In Weisgerber, Matthias (ed.), *Proceedings of Sinn und Bedeutung 7*, pp. 257–271.
- Sauerland, Uli, 2000. The content of pronouns: Evidence from focus. In Jackson, Brendan and Tanya Matthews (eds.), *Proceedings of SALT X*, pp. 167–184. Cornell University, Ithaca, NY: CLC Publications.
- , 2005. Don't interpret focus! Why a presuppositional account of focus fails and how a presuppositional account of givenness works. In Maier, Emar, Corien Bary, and Janneke Huitink (eds.), *Proceedings of Sinn und Bedeutung 9*, pp. 370–384.
- Schwarzschild, Roger, 1999. Givenness, AvoidF and other constraints on the placement of accent. *Natural Language Semantics*, 7:141–177.
- Selkirk, Elisabeth, 1984. *Phonology and syntax: the relation between sound and structure*. Cambridge, Mass.: MIT Press.
- , 1996. Sentence prosody: intonation, stress and phrasing. In Goldsmith, J. A. (ed.), *The handbook of phonological theory*. London: Blackwell Publishers.
- Stechow, Arnim von, 1990. *Focus and Backgrounding Operators*. Tech. rep., Fachgruppe Sprachwissenschaft der Universität Konstanz. Arbeitspapier Nummer 6, Konstanz.
- Truckenbrodt, Hubert, 1995. *Phonological Phrases: their relation to syntax, focus, and prominence*. Ph.D. thesis, MIT.
- Umbach, Carla, 2005. Contrast and information structure: a focus-based analysis of *but*. *Linguistics*, 43:207–232.
- Wagner, Michael, 2006. Givenness and locality. In Gibson, M. and Jonathan Howell (eds.), *Proceedings of SALT XVI*, pp. 295–312. Ithaca, NY: CLC Publications.
- Williams, Edwin, 1997. Blocking and anaphora. *Linguistic Inquiry*, 28:577–628.