

FOCUS DEPENDENCY AS STRUCTURE SHARING*

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Abstract

Focus dependency is an important phenomenon at the syntax-semantics interface: Elided material can exhibit bound-variable-like behavior when its antecedent is a focussed phrase in the same sentence. In the past, focus dependency has been analyzed as actual binding or by means of copying. This paper presents a new account of focus dependency that relies on structure-sharing. Structure-sharing allows sub-phrases to be syntactically linked to more than one position of a phrase marker. The proposal better explains focus dependency than existing accounts especially when we consider novel data from the interaction of focus-dependency and MaxElide.

1 Introduction

There is an important and, in my opinion, insufficiently studied phenomenon at the syntax-semantics interface: An elided phrase or parts of it can depend on an earlier overt occurrence of the same phrase in way that resembles variable binding. One type of example showing this phenomenon is Kratzer's (1991) well-known Tanglewood sentence (see below). The phenomenon, however, is much more wide-spread. For the purposes of this paper, I use the term *Focus Dependency* for the phenomenon at issue. I understand focus dependency in the following way:

- (1) *Focus Dependency*: An elided occurrence of a phrase XP can co-vary in interpretation with a focussed occurrence of the same phrase XP.

Working independently of each other, Hardt (1999) and Schwarz (1999) first systematically investigated focus dependency: Schwarz's (1999) example (2) illustrates focus-dependency by a VP. The example allows a reading where it entails that you do not say I should not whistle when I whistle. This reading is based on a focus dependency of the elided VP Δ_1 on *sing* in the first conjunct and a parallel dependency in the second conjunct.

- (2) (Schwarz 1999, (33))
When I whistle you say I shouldn't Δ_1 , but when I sing you don't Δ_2 .
 Δ_1 = whistle, Δ_2 = say I shouldn't sing

Example (2) also allows a second reading that entails that, when I sing, you do not say that I should not whistle. But, it is easy to show that a distinct focus dependency reading is available. The following scenario does the job: You hate my whistling, but like my

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singing. Furthermore I have a tendency to break into whistling when I sing. So, whenever I whistle or sing, you always tell me not to whistle. In this scenario, it is not true that, when I sing, you don't say I shouldn't whistle. Since (2) is true in the scenario, it can only be true because of the focus dependency reading. Focus dependency is puzzling because there is strong evidence that an elided phrase must be very similar in interpretation to another phrase in the same discourse (Hankamer and Sag 1976, Rooth 1992). But this is not the case with focus dependency: no other phrase has the same or even a very similar meaning to the elided phrase *say I shouldn't whistle*.

In this paper, I argue that focus dependency should be analyzed in terms of structure-sharing. I first show some problems with existing analyses, before presenting my own. I then review the predictions of my analysis in section 3.

2 The Proposals

2.1 Binding Based Analyses

Both Schwarz (1999) and Hardt (1999) analyse examples like (2) as involving a special kind of binding relationship. In its crudest form, this type of analysis assumes that this binding relationship is created by a syntactic mechanism—covert movement to a c-commanding position. This creates the LF-representation in (3). In the first conjunct, the VP *whistle* is extracted from the *when*-clause and then binds a VP-pro-form in the elided VP. In the second conjunct, the VP *sing* undergoes parallel covert movement and then also binds a VP-pro-form in the elided VP in the second conjunct.

- (3) [whistle]_{VP} λ_i [When I t_i you say I shouldn't [pro_i]_{Δ₁}],
but [sing]_{VP} λ_j [when I t_j you don't [say I shouldn't t_j]_{Δ₂}]

Ellipsis is predicted to be licensed in (3) in the same way as with sloppy readings of VP-ellipsis. In particular, Rooth (1992) account of VP-ellipsis licensing carries over: The constituent consisting of λ_j and its complement as a focus domain is identical in interpretation to the constituent consisting of λ_i and its complement in the first conjunct.

However, Schwarz (1999) already points out two problems for the binding analysis: lack of c-command and that extraction is possible from the putative variable. Lack of c-command is illustrated by (2) where *whistle* and *sing* are embedded in a conditional clause and therefore do not c-command the elided VP. Generally, covert movement is assumed to be blocked in such a case because quantifiers cannot take scope outside of a *when*-clause. The scopal restriction still holds in examples with a focus dependency (specifically, an NP focus dependency), as (4) shows.

- (4) When I want many books, you buy some Δ₁, but when I want many toys, you don't Δ₂.
Δ₁ = books, Δ₂ = buy some toys.

Schwarz and Hardt each address the lack of a c-command restriction in their own way. Schwarz (1999) points out that there is also no c-command restriction for sloppy interpretations in VP-ellipsis as Tomioka (1999) discusses in detail. (5) is one example where a sloppy interpretation is available, though c-command does not obtain.

- (5) (Tomioka (1999):219 who credits unpublished work by M. Wescoat)
 The police officer who arrested John insulted him, and the police officer who arrested Bill did Δ , too.
 Δ = insult him

However, I do not think that Tomioka's proposal for (5) should be taken as the basis for analysis of focus dependency because Tomioka's proposal itself has problems (Elbourne 2002). Tomioka (1999) proposes that *him* is analyzed as the definite description *the person he arrested* both in the overt clause and in the elided VP in (5). This is what Elbourne (2002) calls a D-type analysis of the pronoun *him*. However, the version Tomioka relies on suffers from the problem of the formal link: Tomioka's analysis would predict that (6) too should have an interpretation of the pronoun as *his wife*.¹

- (6) *The police officer who married Sue kissed her, and the married fireman did too Δ .
 Δ = kiss the fireman's wife

Elbourne (2002) argues that D-type pronouns generally cannot stand for any salient description, but is derived by NP-ellipsis. If Elbourne is correct (and (6) supports his analysis further), then Tomioka's analysis of (5) cannot be maintained. I conclude therefore that Schwarz's suggestion to reduce focus dependency to Tomioka's analysis cannot be correct. At the same time, I still believe that there is a close relationship between Tomioka's data and focus dependency. In fact, I propose that Tomioka's examples are special cases of focus dependency. This analysis is illustrated for (5) in (7).²

- (7) The police officer who arrested John insulted him Δ_1 , and the police officer who arrested Bill did Δ_2 , too.
 Δ_1 = John, Δ_2 = insult Bill

Now consider Hardt's (2003) proposal to overcome the lack of c-command. He assumes that there is a second binding mechanism called center binding that operates without a c-command restriction. A series of starred pronouns, *pro**, refers to the discourse center, and focus can set a new discourse center. For (5), Hardt would assume the representation in (8).

- (8) The policeman who arrested John_F hit him*, and the policeman who arrested Bill_F did [hit him*] _{Δ} , too.

But, Hardt's center binding, too, has at least two problems: the formal link (again) and examples with multiple antecedents.³ Concerning the formal link, Hardt might say about (7) that the phrase *married fireman* is not sufficient to introduce the fireman wife as a new discourse center. However, in other examples the formal link is still a problem for Hardt. Consider the German examples in (9):

¹Elbourne (2001) makes a similar point with example (i). Tomioka's analysis incorrectly predicts an interpretation where *R* is interpreted as *person he arrested* to be available.

- (i) Scenario: Officer Jones arrested a pimp.
 Every police officer who arrested a murderer insulted him [the *R*], and Officer Jones insulted him [the *R*] too.

²Elbourne assumes that proper names are NPs with an empty definite determiner.

³Furthermore, Hardt's proposal does not predict clause-boundedness as Safir (2005) points out. I discuss the relevant fact in (15) below.

- (9) a. Wer mit dem Auto kommt, muß es/*ihn parken.
 who with the car.NEUT comes must it/*him park
 b. Wer mit dem Wagen kommt, muß ihn/*es parken.
 who with the car.MASC comes must him/*it park

Both examples in (9) allow a focus dependency because both can be continued with *aber wer mit dem Rad kommt, nicht* ('but who comes bike, does not [have to park it]'). Hence the pronoun following *muß* in (9) should be able to be *pro** in both (9a) and (9b). But the analysis does not predict that the pronoun must match the grammatical gender of the NP it is anaphoric to.

A further problem for center binding are examples with multiple focus dependencies such as (10). Here Hardt would have to say that two discourse centers are involved and that *she* and *it* both each refer to one of them. However, a restriction to one backward looking discourse center is established in centering theory (Grosz, Weinstein and Joshi 1995). So, Hardt's proposal must be crucially different from centering theory, and therefore has no independent motivation.

- (10) When a woman buys a blouse we ask that she try it on, but when a man buys a shirt we don't Δ .
 Δ = ask that the man try on the shirt

I conclude therefore that the lack of a c-command restriction creates a problem for a binding analysis of focus dependency.

The second problem for the binding analysis in general are examples with sluicing like (11). (11) demonstrates the possibility of extraction from the putative variable:⁴

- (11) If you email someone you can look up later who Δ_1 , but if you call someone you can't Δ_2 .
 Δ_1 = you emailed *t*, Δ_2 = look up who you called *t*

Merchant (2001) has argued that sluicing should be analyzed as IP-ellipsis with syntactic extraction out of the ellipsis site. But if the sluiced phrase in both conjuncts in (11) is analyzed as an IP-variable, there is no site from which extraction of *who* could take place. I conclude therefore that neither version of the binding analysis provides a satisfactory account of focus dependencies.

2.2 The Copy and Focus Based Analysis

A second kind of analysis was proposed by Kratzer (1991) (building on a sketch of Rooth (1985)). Kratzer's aim is to make the analysis of focus 'variable-like'. Her specific implementation is based on an LF-copying analysis of ellipsis, which also copy a focus marks into the elided VP. Focussed constituents are marked with additional indices as in (12). The copying process ensures that the focus marks in the overt constituent and in the elided constituent are coindexed.⁵ In example (2), two steps of copy operations apply to the surface representation (12a): in (12b) the VP from the first conjunct is copied into the second conjunct, and then the smaller VP is copied in each conjunct resulting in (12c).

⁴Schwarz's own example does not make this point as forcefully as (11) since it involves sluicing with *why*, which might be base-generated in a VP-external position (Tsai 1994).

⁵See Sauerland (1998) for an analysis similar to Kratzer's that does not rely on LF-copying.

- (12) a. When I whistle_{F₁}, you say I shouldn't Δ , but when I sing_{F₂}, you don't Δ
 b. When I whistle_{F₁}, you say I shouldn't Δ ,
 but when I sing_{F₂}, you don't [say I shouldn't Δ] Δ
 c. When I whistle_{F₁}, you say I shouldn't [whistle_{F₁}] Δ ,
 but when I sing_{F₂}, you don't [say I shouldn't [sing_{F₂}] Δ] Δ

The focus alternatives of a phrase, Kratzer defines as the set of values $\llbracket XP \rrbracket_f^G$ for any focus assignment G for which this is defined. A focus assignment is a typed Tarskian variable assignment: It maps a pair of an index i and a type τ to an individual of type τ . A focussed constituent is interpreted as follows:

- (13) a. normal semantic value: $\llbracket X_{F_x} \rrbracket^g = \llbracket X \rrbracket^g$
 b. focus semantic value: $\llbracket X_{F_x} \rrbracket_f^{g,G} = G(n,\tau)$ where τ is the semantic type of $\llbracket X \rrbracket^g$.

Note that Kratzer's proposal for focus dependency also accounts for sloppy interpretations without c-command by way of Elbourne's NP-ellipsis analysis of pronouns. For example (5), this analysis is shown in (14): Recall that proper names are analyzed as NP-complements of a null determiner. In each conjunct, the focussed proper name NP is copied to the NP-position following the pronoun.

- (14) The police officer who arrested John_{F₁} insulted him [John_{F₁}] Δ , and the police officer who arrested Bill_{F₂} did [insult [Bill_{F₂}] Δ] Δ

However, Kratzer's proposal has two kinds of problem: problems with clause-boundedness and problems for LF-copying analyses of VP-ellipsis. Consider first clause-boundedness of focus-dependency. This was originally described by Safir (2005). He observes that a sloppy interpretation is not available in (15):

- (15) *John is a dealer and criminal. Luckily, the police arrested him. Bill is an even worse dealer and criminal. Unfortunately, the police didn't Δ .
 Δ = arrest Bill

Kratzer's analysis, however, predicts a sloppy interpretation to be available in (15). The derivation of (15) involves two step of copying as in (16): first the VP is copied into the last clause, then the two empty NPs following the pronouns are filled.

- (16) a. John_{F₁} is a dealer and criminal. Luckily, the police arrested him Δ Bill_{F₂} is an even worse dealer and criminal. Unfortunately, the police didn't [arrest him Δ] Δ
 b. John_{F₁} is a dealer and criminal. Luckily, the police arrested him [John_{F₁}] Δ Bill_{F₂} is an even worse dealer and criminal. Unfortunately, the police didn't [arrest him [Bill_{F₂}] Δ] Δ .

Syntactic copying for ellipsis resolution cannot be sensitive to clause-boundaries because the antecedent of an elided VP can be in a different clause. One possibility to rule out the sloppy interpretation in (16), would be to force copying in an earlier clause to take place before a later clause is processed. However, this would incorrectly rule out a sloppy interpretation in (17), as well.

- (17) Because John is a dealer and criminal, the police arrested him. But, though Bill is an even worse dealer and criminal, the police didn't Δ .
 Δ = arrest Bill

Hence, I conclude that focus dependencies are sensitive to clause boundaries, but not to c-command. Kratzer's analysis incorrectly predict no clause boundary effects. I should add that while I argue for the clause-boundedness restriction using Safir's NP-ellipsis example, the point can also be made with VP-ellipsis examples: (18) is a case in point.

- (18) *Last week, John was about to sing. Fortunately, you convinced him not to Δ_1 .
 Yesterday, John was about to whistle. This time, I did Δ_2 .
 (Δ_1 = sing, Δ_2 = convince him not to whistle)

Furthermore, arguments against the LF-copying analysis of VP-ellipsis argue against Kratzer's analysis (Rooth 1992, Fox 1999).

2.3 The Structure Sharing Analysis

I assume like Kratzer that focus dependency involves a syntactic relationship. However, this is not established by copying, but by structure sharing. Structure sharing is possible in syntactic theories that allow multi-dominance like (Gärtner 2002). Such theories assume that one phrase can occupy two positions of a syntactic tree. I represent structure sharing as in (19). Here, the VP *whistle* occupies both the VP position in the *when*-clause and the complement position of *whistle*, and the VP *sing* occupies the same two positions in the second clause.

- (19) when I [$_$]_F you say I shouldn't [$_$] _{Δ} when I [$_$]_F you don't [say I shouldn't $_$] _{Δ}
└──────────────────────────────────┘ └──────────────────────────────────┘
whistle sing

I assume that material that is structure-shared in this way must not be pronounced more than once—at least, this restriction makes correct predictions for English, while languages that have productive copying constructions may differ (cf. Kobele (2006)). But at least for English, it is predicted that focus dependencies depend on ellipsis (see below). I furthermore assume that, the semantic value of the structure shared material is determined independently each time it is linked to a position in a structure. This assumption allows a sloppy interpretation of structure-shared material of the kind illustrated by (20):⁶

- (20) When I phone my mother, I assume you do as well Δ_1 , but when I email my father, I don't Δ_2 .
 Δ_1 = phone your mother, Δ_2 = assume that you email your father

My proposal furthermore relies on a particular analysis of focus: I assume that the focus alternatives are generally defined by reference to LF-structures.

- (21) XP is a focus alternative to YP if and only if there is a sequence of replacements applying to YP that result in XP, where each step replaces a phrase dominated by the focus feature F with a phrase of the same syntactic category.

⁶I assume here following Heim (to appear) that the bound pronouns *my* and *your* in (20) have no semantically interpreted features.

Such a syntactic definition of focus alternatives has been argued for by Fox (2000). New support for it comes from observations of Krifka (2001) for a ban on complex foci and Artstein's (2004) on focus on meaningless word parts. Artstein argues that *stalagmite* should be the only non-trivial focus alternative of *stalacTITE* with focus on the final syllable. While Artstein argues for a proposal where meaningless word-parts can be assigned a kind of compositional meaning, the facts can also be captured by the replacement in (22) within the syntactic analysis of focus alternatives.

(22) YP = John saw a stala[cTITE]_F → XP = John saw a stalagmite.

Krifka (2001) points out the question-answer paradigm in (23): While VP focus in (23a) is possible, it is not possible to have the two phrases VP consists of each separately in focus. Since any possible action of John's might be described as him doing something somewhere, a purely semantic condition of focus licensing such as Schwarzschild's (1999) does not predict (23b) to be odd.

- (23) What did John do?
- a. [Drive to BERLin]_F
 - b. #[DRIVE]_F [to BERLIN]_F

While Krifka proposes an account of (23) using structured meanings, the current purely structural account also predicts (23): While in (23a) replacing the entire VP with *do something* yield a focus alternative the question provides, (23b) requires a preceding question consisting of a verb and a directional or locative adverbial.

Structure sharing is predicted to interact with focus in a specific way. Namely, structure shared material will be focused in all positions it is linked to if and only if one of the positions it is linked to is dominated by an F-mark. Consider the account of (2): *whistle* and *sing* are focussed as shown in (22). Since I assume that elided material cannot be focussed, the focus marks of the two verbs must only be associated with the first position they are linked to. To license VP-ellipsis, I assume following Rooth (1992) that some constituent YP containing the elided VP must be such that a focus alternative of YP occurs in the previous discourse. In structure (22), this condition is fulfilled if we consider the YP indicated in (24): Within YP, *sing* is dominated by an F-feature and therefore replacing *sing* with *whistle* is a focus alternative of YP.

(24) $\overbrace{\text{when I } [_]_{\text{F}} \text{ you don't [say I shouldn't } _]_{\Delta}}^{\text{YP}}$
└──────────────────────────────────┘
sing

Note however, that YP must include the *when*-clause for ellipsis to be licensed. In (25), a smaller domain for ellipsis licensing is indicated. But, in this domain no F-mark dominates *sing*, and therefore replacing *sing* with *whistle* does not result in a focus alternative.

(25) $\text{when I } [_]_{\text{F}} \overbrace{\text{you don't [say I shouldn't } _]_{\Delta}}^{\text{YP}}$
└──────────────────────────────────┘
sing

This interaction between the parallelism domain and focus dependency will become important below.

3 Predictions of the Analysis

In this section, I first show that the structure sharing analysis predicts those properties of focus dependency already discussed above. I then show how additional facts about focus dependency corroborate the structure sharing analysis.

3.1 Category Indifference

The examples of focus dependency discussed up to now, have already shown that focus dependencies are available for any category: VP in (2), NP in (4), IP in (11). This state of affairs is exactly predicted by the structure sharing analysis because there is no motivation to restrict structure sharing to a particular syntactic category.

3.2 Basic Configurational Requirements

The basic configurational requirements of a focus dependency were also already introduced. Example (2) shows that focus dependency is not constrained by c-command. Example (15) shows that a sentence boundary blocks a focus dependency. Clause boundedness is a natural restriction for structure sharing because syntactic structures are built clause by clause, and therefore no interclausal syntactic relationships exist. Whether c-command constraints syntactic operations is rather debated. For example, Bobaljik and Brown (1997) argue that copying should not be constrained in this way. I adopt this assumption for structure sharing rather than copying. Then it is predicted that structure sharing is available in examples like (2).

3.3 Extraction

The analysis predicts no restriction on extraction from elided phrases that receive a focus-dependent interpretation. This follows in some way, however, from the category indifference of structure sharing. Consider again the sluicing example (11) (repeated in (26)).

- (26) If you email someone you can look up later who Δ_1 , but if you call someone you can't Δ_2 .
 $\Delta_1 =$ you emailed t , $\Delta_2 =$ look up who you called t

In this case, I assume that VP structure sharing as shown in (27a) is not possible since presumably *someone* and the trace of extraction of *who* are not formally identical. However, the representation shown in (27b) remains available if structure sharing is truly category indifferent.

- (27) a. *If — you look up later who_j [—]_Δ
└──────────────────┘
you email someone
email
 b. If — — someone you look up later who_j [— — t_j]_Δ
└──────────────────┘
you

Further support for the availability of multiple structure sharing comes from (28), which allows a partially focus dependent interpretation.

- (28) When I play the violin, you say I shouldn't Δ_1 , but when I sit at the piano, you don't Δ_2 .
 $\Delta_1 = \text{play the violin}, \Delta_2 = \text{say I shouldn't play the piano}$

This interpretation is captured by the representation in (29):

- (29) when I sit at [—]_F, you don't [say I shouldn't play —]_Δ
└──────────────────────────────────┘
the piano

However, it remains to be investigated to what extent such mixed readings are available. For example, the indicated mixed interpretation seems to be hard to obtain in (30).

- (30) When I kill a fish, you say I shouldn't Δ_1 , but when I catch a squid, you don't Δ_2 .
 $\Delta_1 = \text{kill the fish}, \Delta_2 = \text{say I shouldn't kill the squid}$

3.4 Formal Link

Examples (6) and (9) above provide evidence for a formal link between the two elements of a focus dependency. On the structure sharing analysis, the formal link is forced because the two elements of a focus dependency are the same syntactic material. Consider for example the structure-sharing analysis for (9b) in (31). Because the noun *car* with grammatical gender *masc* is linked to two positions in the syntactic structure, both must have the same grammatical gender.

- (31) who with — comes must him it.MASC — park
└──────────────────────────────────┘
the.MASC car.MASC

The four properties of focus dependency discussed in this and the previous subsections are all the properties already mentioned in the discussion of the binding and focus based approaches. I showed that these properties are straightforwardly captured by the structure sharing analysis, while they created difficulties for the other two proposals. In the following subsections, I discuss properties of focus dependency not mentioned yet in this paper.

3.5 Bound-Variable Like Behavior

The bound-variable like behavior is clearly displayed by Kratzer's (1991) Tanglewood example in (32).⁷

- (32) I only went to [Tanglewood]_F because you did Δ .
 $\Delta = \text{go to Tanglewood}$

Kratzer notes that (32) is different from (33) with double-focus. Namely, the focus alternative to the overt and elided occurrence of *Tanglewood* in (32) must covary, while only (33) allows the continuation *I didn't go to Lubbock because you went to Williamstown*, which requires a non-covarying focus alternative.

⁷Similar examples are of course possible with a VP focus dependency and probably with other categories too:

- (i) I only SING because you told me to.

(33) I only went to [Tanglewood]_F because you went to [Tanglewood]_F.

The difference between (32) and (33) follows from the fact that only (33) allows the structure sharing analysis in (34). For (33), such a representation is not available since I assume that structure shared material must not be pronounced more than once.

(34) I only went to [—]_F because you did [go to —]_Δ
└──────────────────┘
Tanglewood

3.6 Ellipsis Requirement on Dependents

The contrast between examples (32) and (33) already shows that a focus dependency requires ellipsis of the dependent. This also holds for examples like (2) where the focus dependency is required for ellipsis licensing as Schwarz (1999) discusses. Example (35) shows that when *sing* in (2) is not elided, but spelled out, it must be focused.

(35) (Schwarz 1999, (8b))
 When I [WHISTLE]_F you say I shouldn't Δ, but when I SING you don't say I shouldn't [SING]_F/# *sing*
 Δ = whistle

The difference between (2) and (35) follows on the structure sharing analysis from the condition that structure shared material must be pronounced only in one position. While in (35) structure sharing is possible in the *when*-clause, this is not sufficient to license destressing of the second occurrence of *sing*.

Schwarz also considers already the case in (36) with ellipsis in the second conjunct, but not in the first. Schwarz claims that (36) allows the focus dependent reading, but reports in a footnote that it is not as easily available as in other cases. For my informants, (36) did not allow the focus dependent interpretation easily, hence I mark it here as being only very marginally available.

(36) (Schwarz (1999):(12) with different judgment)
 *?When I whistle you say I shouldn't whistle, but when I sing you don't Δ.
 Δ = say I shouldn't sing

A similar intermediate status is obtained for the sloppy interpretation of (37).

(37) *?The policeman who arrested John hit John, and the policeman who arrested Bill did too Δ.
 Δ = hit Bill

The intermediate status of (36) and (37) is predicted by the structure sharing analysis. While the second conjunct of (36) can have the structure sharing analysis in (38), the focus alternative obtained by replacing *sing* with *whistle* is not available in the discourse as an antecedent because the first conjunct does not allow a structure sharing analysis.

(38) when I [—]_F you don't [say I shouldn't —]_Δ
└──────────────────┘
sing

However, this focus alternative is entailed by the first conjunct. There is evidence that VP-ellipsis can be licensed via an entailment (Rooth 1992, Fox 1999) in some cases. The marginality of VP-ellipsis in (36), I propose, follows from the fact that there is an alternative completion of the ellipsis site, namely *say I shouldn't whistle*, which is licensed without drawing an entailment from the antecedent first.

3.7 Antecedent Focus Requirement

The three analysis of focus dependency differ with respect to the role of focus on the antecedent:⁸ For the binding based analysis, focus plays no role; for the focus based analysis, focus must be on the antecedent; and for the structure sharing analysis, the antecedent must be part of a focus. (39) is a test for the distinction between the latter two analyses. The German translation of (39) is acceptable in the context of a discussion of whether I have problems talking with Mary and her family.

- (39) When I met Mary's father, I talked to him and when I met [her]_F, I did Δ , too.
 Δ = talk to Mary

The acceptability of (39) is predicted by the structure sharing analysis, but not by the focus based analysis. (40) shows the structure sharing analysis of the second conjunct of (39): *her* contains an elided definite description *Mary* that is structure shared, but *her* itself is in focus. Therefore, the replacing *Mary* with *Mary's father* is a focus alternative of (40).

- (40) when I met [her [—] _{Δ} I did [talk to —] _{Δ}
└──────────┘
Mary

On the focus based analysis, however, the antecedent *Mary* itself must bear a focus mark, which would then be copied into the ellipsis site. But the antecedent *Mary* in (39) is itself elided, and the prior occurrence of *Mary* is not necessarily focussed.⁹ I conclude therefore that (39) provides an additional argument against the focus based analysis.

On the binding based analysis, it is easy to account for (39) because binding does not depend on focus. To distinguish between the predictions of the binding based analysis and the structure sharing analysis, examples where the antecedent in a focus dependency is not part of a larger focus are necessary. Unfortunately it is difficult to find relevant facts, and I leave this matter for future research.¹⁰

3.8 Dependency Parallelism

Dependency parallelism is a condition Fiengo and May (1994) observe for the sloppy interpretation of a bound pronoun. It requires the antecedents of the two pronouns to be

⁸Bernhard Schwarz (p.c.) alerted me to this fact.

⁹One could, of course, assume that when copying to fill ellipsis sites, the source is always the first occurrence of a phrase in a discourse, which usually would bear focus. But, this seems implausible to me.

¹⁰(i) is my best current attempt, but it's not presently clear whether intonational marking *do* can create a VP-focus.

(i) ??When I sing you say I shouldn't. I started to whistle, because when I do, you don't.

in structurally parallel positions. In Sauerland (1998), I point that a sloppy interpretation is unavailable in (41) in contrast with (5).¹¹

- (41) *The policeman who John talked to read him his rights and the policeman who arrested Bill did Δ , too.
 Δ = read Bill Bill's rights

Dependency parallelism follows from the structure sharing analysis because ellipsis can only be licensed in a domain that includes the antecedent: For (41), this would be the domain YP indicated in (42). But, no focus alternative of (42) occurs in the discourse.

- (42) $\overbrace{\text{the policeman who [arrested]}_F \text{ [---]}_F \text{ did [read him --- his rights]}_\Delta}^{\text{YP}}$
└──────────┘
Bill

The focus based analysis does not predict the dependency parallelism condition because it does not assume any condition other than LF-copying for ellipsis licensing. Of the binding based analyses, only those predict dependency parallelism that require a wide domain like (42) for ellipsis licensing. This is the case for the extraction analysis described first in section 2.1, but not for the center index based analysis of Hardt (2003).

3.9 Structure Sharing and MaxElide

MaxElide is a new condition on ellipsis licensing first described by Takahashi and Fox (2005), which requires the deletion of as much of a parallelism domain as possible. As stated above, I assume that a parallelism domain (or ellipsis licensing domain) is a phrase such that a focus alternative of it occurs in the discourse. For ellipsis licensing, I assume the two conditions in (43):

- (43) a. Ellipsis of XP must be licensed by a parallelism domain YP that dominates XP. (Rooth 1992)
 b. MaxElide: There must be no XP' dominated by YP and dominating XP such that XP' can be elided.

As Takahashi and Fox (2005) argue, MaxElide has no effect in many examples because the position of parallelism domains is flexible. For example, ellipsis can target either the higher or lower phrase in (44) depending on the choice of parallelism domain.

- (44) (Takahashi and Fox 2005, (12))
 a. John said Mary likes Peter. $\underbrace{\text{BILL also did [say she likes Peter]}_\Delta}_{\text{parallelism domain}}$
 b. John said Mary likes Peter. BILL also said $\underbrace{\text{she does [like Peter]}_\Delta}_{\text{parallelism domain}}$

¹¹Tomioka (1999, 222) argues for a different conclusion. However, his examples allow implicational bridging (cf. Rooth (1992)): For example, the first conjunct of (i)—one of Tomioka's examples—entails that people in New York hate its subway system. (41) controls for implicational bridging.

(i) Those who live in New York hate its subway system, and people in Tokyo do Δ , too.

MaxElide only has an effect when small parallelism domains are blocked. Following Rooth (1992), Takahashi and Fox (2005) assume that binding blocks small parallelism domains. Therefore, a sloppy interpretation is blocked when ellipsis is not maximal as in (45b).

- (45) (Takahashi and Fox (2005, (5)) after Sag (1976, p. 131))
- a. John said Mary hit him, and BILL λ_x also did [x say Mary hit x] $_{\Delta}$
parallelism domain
 - b. *John said Mary hit him, and BILL λ_y also y said she did [hit y] $_{\Delta}$
parallelism domain

The different accounts of focus dependency make different predictions for the interaction with MaxElide. The deciding factor is whether ellipsis licensing requires a focus domain that includes the antecedent. Since binding based analyses other than Hardt's and the structure sharing based analysis require such a wide parallelism domain, they predict that MaxElide effects should be observed with focus dependencies. The center binding and the focus based analysis make the opposite prediction. The facts in (46) and (47) bear out the prediction of the former set of analyses.

- (46) a. The policeman who arrested John threatened to hit him Δ_1 , and the policeman who arrested Bill did Δ_2 , as well.
 $\Delta_1 = \text{John}, \Delta_2 = \text{threaten to hit Bill}$
- b. *?The policeman who arrested John threatened to hit him Δ_1 , and the policeman who arrested Bill threatened to Δ_2 , as well.
 $\Delta_1 = \text{John}, \Delta_2 = \text{hit Bill}$
- (47) a. When I sing you say it is nice that I do Δ_1 , but when I whistle you don't Δ_2
 $\Delta_1 = \text{sing}, \Delta_2 = \text{say it is nice that I whistle}$
- b. *When I sing you say it is nice that I do Δ_1 , but when I whistle you don't say it is Δ_2
 $\Delta_1 = \text{sing}, \Delta_2 = \text{nice that I whistle}$

Specifically the structure sharing analysis predicts the contrast in (47) in the following way: Consider the structure of the second conjunct in (48). The only parallelism for which the first conjunct is a possible antecedent is the entire second conjunct because any domain that does not include the *when*-clause does not contain an F-feature dominating *whistle*. Therefore MaxElide dictates the the biggest subconstituent of this domain that can be elided must be: ellipsis of the VP headed by *say* is forced.

- (48) when I [---]_F you don't [$\text{say it is nice that I do ---}$] _{Δ}
whistle

I conclude that the interaction of MaxElide and focus dependencies provides another argument against center binding and the focus based analysis of focus dependencies.

3.10 Cross-Over Constraint

Focus-dependency is subject to a kind of cross-over constraint. Tomioka (1999, 220) observes that a sloppy interpretation is unavailable in (49) (see also Safir (2005, 51)).

- (49) *The guy who likes him gave John a present, and the guy who doesn't \triangle gave Bill nothing.
 \triangle = likes Bill

On the structure sharing analysis, (50) requires an additional constraint. One possibility is a requirement that there is a condition that structure shared material must always pronounced in the left-most position it is linked to. This condition is violated in the structure (50).¹²

- (50) the guy who like him — gave [---]_F a present
└───┘
John

4 Conclusion

This paper argues for an analysis of focus dependency on the basis of structure sharing.

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¹²However, this purely linear constraint has a problem with psych-verbs. Fiengo and May (1994) point out that (i) does not allow the sloppy reading that is indicative of a focus dependency. This point requires further investigation. It seems that for VP focus dependencies there is no contrast between transitive verbs and psych-verbs in (ii)

- (i) *A rumor about John annoyed him, but a rumor about Bill didn't \triangle
 \triangle = annoy Bill
- (ii) Usually people who snore hate/bother other people who do \triangle_1 , but people who sleepwalk don't \triangle_2 .
 \triangle_1 = snore, \triangle = hate/bother other people who sleepwalk

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