

Chapter 1 Association with Focus Phrases¹

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1. The Nature of Association with Focus

Certain semantic operators, including particles like *only*, *also* and *even*, contribute to the meaning of the sentence in ways that depend on the positioning of focal accent in the sentence. This well-known phenomenon, called association with focus, is evident with examples like (1.a,b).

- (1) a. *John* [_{VP} *only* [_{VP} *introduced Bill_F to Sue.*]]].
‘The only person John introduced to Sue is Bill.’
b. *John* [_{VP} *only* [_{VP} *introduced Bill to Sue_F*]]
‘The only person John introduced Bill to is Sue.’

According to the central semantic principle of compositional interpretation, the meaning of a complex constituent is a function of its immediate syntactic subconstituents. In examples like (1.a,b), the meaning of the larger VP starting with *only* should depend on the meaning of the semantic operator *only* and the meaning of the smaller VP c-commanded by *only*, its scope. As some feature of a constituent properly contained in the scope of *only* influences the meaning of the constituent containing *only*, this feature within the scope must somehow modify the meaning of the scope as a whole. In our example, the meaning of *introduced Bill to Sue_F* and *introduced Bill_F to Sue* must be different.

A number of proposals have been developed that allow for that kind of meaning sensitivity to prosody. Here I will discuss two types of theories, Structured Meanings (SM) and Alternative Semantics (AS).

1.1. Structured Meanings / Syntactic Movement

The SM approach, as proposed by Jacobs (1983), von Stechow (1990) and others assumes that focus-sensitive operators like *only* have access to both the expression in focus and the position within the scope in which the focus is located. In a non-representational semantic theory, which does not allow for syntactic manipulations of expressions of a semantic representation language, the meaning of *only* must be able to access the meaning of the focus *F*, the alternatives of the focus *A*, and a function *B* that maps the meaning of the focus to the meaning of the scope, commonly called the background. This is illustrated in the following example:

- (2) $[_{VP} \textit{introduced Bill}_F \textit{ to Sue}]$
 Focus-background structure: $\langle \text{BILL}, A, \lambda X[\text{INTROD}(\text{SUE})(X)] \rangle$
 Background applied to focus: $\text{INTROD}(\text{SUE})(\text{BILL})$

The set of alternatives must contain the focus, here: $\text{BILL} \in A$, and it must contain at least one additional element. Typically, the set of alternatives is restricted by context.

Focus-sensitive operators take such background–focus structures and convert them into standard meanings. This is illustrated here with a simplified meaning rule for adverbial *only*:

- (3) $\text{ONLY}(\langle F, A, B \rangle) = \lambda x \forall Y \in A [B(Y)(x) \rightarrow F = Y]$

For our example we get the following result:

- (4) $\text{ONLY}(\langle \text{BILL}, A, \lambda x[\text{INTROD}(\text{SUE})(x)] \rangle)(\text{JOHN})$
 $= \forall y \in A [\text{INTROD}(\text{SUE})(y)(\text{JOHN}) \rightarrow y = \text{BILL}]$

That is, for every alternative *y* to Bill it holds that if John introduced *y* to Sue, then *y* is Bill. Put differently, John didn't introduce any alternative besides Bill to Sue.

The SM theory faces the challenge of how the focus-sensitive particle is informed about the meaning of the focus item and the nature of its contribution to the scope. One prominent answer, proposed by Chomsky (1976), is syntactic movement, which provides the acronym SM with another reading. In the case at hand, this is covert movement on logical form:

- (5) SS: $[_{VP} \textit{introduced Bill}_F \textit{ to Sue}]$
 LF: $[\textit{Bill}_i [\textit{introduced } t_i \textit{ to Sue}]]$
 Interpretation: $\langle \text{BILL}, A, \lambda x_i [\text{INTROD}(\text{SUE})(x_i)] \rangle$

It is well-known that LF movement as a syntactic operation can be dispensed with in various ways, e.g. operator storage, cf. Cooper (1983), projection of subcategorization features in generalized phrase-structure grammars, cf. Gazdar et al. (1985), or flexible categorial grammar, cf. Hendriks (1993). Such alternatives to LF movement can also be used for the construction of structured meanings; see e.g. Krifka (1992) for a theory couched in a categorial grammar framework. What appears more important than differences in the specific implementations of the SM approach is the implicit claim made by all of them: Namely, that providing the right meanings for focus-sensitive operators is a process comparable to the other task that LF movement and its alternatives have been designed for. The main reason for assuming LF movement is the description of wide scope taking, as with quantifiers. As an example, consider (6).

- (6) *A professor [introduced every honor student to the president].*
LF for wide-scope reading of *every honor student*:
every h. student_i [a professor [introduced t_i to the president]]

Here, *every honor student* is moved and adjoined to the clause, leaving an indexed trace t_i . The constituent the quantifier is adjoined to is marked by the index of this trace to indicate that an expression with this index has been extracted. In semantic interpretation, the indexed constituent will be interpreted as a functional expression (cf. Heim and Kratzer (1998) for this view of LF movement).

Scope taking of quantifiers and informing an operator of the focus and its position seem to require similar manipulations or enrichments of syntactic structure or semantic interpretation: The quantifier or the focus expression have to be identified, and they have to be related to a position within the scope. So it seems natural to posit the same mechanism for scope taking and for association with focus.

Now, it is known since Anderson (1972) and Jackendoff (1972) that scope taking and association with focus appear to have distinct properties: Whereas scope taking of quantifiers is restricted by syntactic island constraints, cf. (7), association with focus appears to be free of it, cf. (8):

- (7) *A professor introduced [the person that every honor student admires most] to the president.*
Not a reading: 'For every honor student there is a professor that introduced the person that the honor student admires most to the president.'

- (8) *John only introduced [the man that Jill_F admires most] to Sue.*
 Possible reading: ‘The only person such that John introduced the man that this person admires most to Sue is Jill.’

As I will argue later, this problem is only apparent. But let us first consider the other prominent approach to the semantics of focus, alternative semantics.

1.2. Alternative Semantics

In the AS approach, as developed by Rooth (1985) and Rooth (1992), neither the expression in focus nor its contribution to the meaning of the scope can be accessed directly. Association with focus is achieved in a considerably simpler way than scope taking of quantifiers. What is required is the ordinary meaning of the scope of the focus-sensitive operator and the alternatives to the ordinary meaning introduced by the expression in focus. These alternatives can be compositionally derived by projecting the alternatives of the expression in focus, by the well-known mechanism first proposed by Hamblin (1973) for wh-questions. Let $\llbracket \alpha \rrbracket$ stand for the ordinary meaning of α and $\llbracket \alpha \rrbracket^A$ for the set of alternatives to this meaning, then this set can be derived compositionally in the following way:

- (9) If $\llbracket [\alpha \beta] \rrbracket = f(\llbracket \alpha \rrbracket, \llbracket \beta \rrbracket)$,
 then $\llbracket [\alpha \beta] \rrbracket^A = \{f(X, Y) \mid X \in \llbracket \alpha \rrbracket^A, Y \in \llbracket \beta \rrbracket^A\}$

If the set of alternative meanings of a simple non-focused expression α is the singleton set of its ordinary meaning $\{\llbracket \alpha \rrbracket\}$ and the set of alternative meanings of a focused expression α_F is some non-singleton set $\text{ALT}(\llbracket \alpha \rrbracket)$, then we get the following two-level interpretation for our example:

- (10) a. $\llbracket [_{\text{VP}} \textit{introduced Bill}_F \textit{to Sue}] \rrbracket$
 $= \lambda x[\text{INTROD}(\text{SUE})(\text{BILL})(x)]$
 b. $\llbracket [_{\text{VP}} \textit{introduced Bill}_F \textit{to Sue}] \rrbracket^A$
 $= \{\lambda x[\text{INTROD}(\text{SUE})(y)(x)] \mid y \in \text{ALT}(\text{BILL})\}$

The meaning of *only* then can be rendered as follows:

- (11) $\llbracket [\textit{only} [_{\text{VP}} \alpha]] \rrbracket = \lambda x[\llbracket \alpha \rrbracket(x) \wedge \forall Y \in \llbracket \alpha \rrbracket^A [Y(x) \rightarrow Y = \llbracket \alpha \rrbracket]]$

For our example, we get the following interpretation:

$$\begin{aligned}
 (12) \quad & \llbracket \text{John} \text{ }_{\text{VP}} \text{ only } \text{ }_{\text{VP}} \text{ introduced Bill}_F \text{ to Sue} \rrbracket \\
 & = \text{INTROD}(\text{SUE})(\text{BILL})(\text{JOHN}) \wedge \\
 & \quad \forall Y \in \{ \text{INTROD}(\text{SUE})(y) \mid y \in \text{ALT}(\text{BILL}) \} \\
 & \quad [Y(\text{JOHN}) \rightarrow Y = \text{INTROD}(\text{SUE})(\text{BILL})]
 \end{aligned}$$

That is, it is claimed that John introduced Bill to Sue, and for all properties Y of the type ‘introduce x to Sue’, where x is an alternative to Bill, if John has property Y , then Y is the property ‘introduce Bill to Sue’.

This approach avoids direct reference to the meaning of the expression in focus; rather, it just makes use of the effects that focusation has on the larger expression. For this to work, it is crucial to assume an intensional representation of meanings. To see this, consider a situation in which John introduced Bill and Jill to Sue, and no-one else introduced them to Sue. Certainly, *John only introduced Bill_F to Sue* is false in this situation, but (12), interpreted extensionally, is true, as we have $\text{INTROD}(\text{SUE})(\text{BILL}) = \text{INTROD}(\text{SUE})(\text{JILL}) = \{ \text{JOHN} \}$. The intensions of these meanings are different, of course; we have $\lambda i[\text{INTROD}(i)(\text{SUE})(\text{BILL})] \neq \lambda i[\text{INTROD}(i)(\text{SUE})(\text{JILL})]$, even in the indicated situation, as Bill and Jill could have been introduced by different persons to Sue.² The proper representation we should work with would assign the following reading to sentence (12), applied to the world i^* of interpretation:

$$\begin{aligned}
 (13) \quad & \text{INTROD}(i^*)(\text{SUE})(\text{BILL})(\text{JOHN}) \wedge \\
 & \quad \forall P \in \{ \lambda i[\text{INTROD}(i)(\text{SUE})(y)] \mid y \in \text{ALT}(\text{BILL}) \} \\
 & \quad [P(i^*)(\text{JOHN}) \rightarrow P = \lambda i[\text{INTROD}(i)(\text{SUE})(\text{BILL})]]
 \end{aligned}$$

This says that John introduced Bill to Sue in world i^* , and for every property P of the properties of the type ‘introduce y to Sue’, where y is an alternative to Bill, the only property P that applies at i^* to John is the property ‘introduce Bill to Sue’.

1.3. Structured Meanings or Alternative Semantics?

Alternative semantics offers a more parsimonious approach to focus sensitivity than the structured meaning approach. For one thing, we can derive the focus representation of alternative semantics from structured meanings, but not vice versa. Let $\langle F, A, B \rangle$ be a structured meaning representation; then the corresponding representation in alternative semantics is $B(F)$ for the ordinary meaning, and $\{B(X) \mid X \in A\}$ for the alternatives. But there is no way to reconstruct a structured meaning

representation out of a meaning m and its alternatives A . Another way to make the point that alternative semantics is the leaner framework is to notice that it does not allow for an operation like binding of variables, in contrast to the SM approach. What AS provides for is something like a semantics for wildcards. In an expression of the type [... * ... * ...], the two occurrences of the wildcard * can be filled independently of each other. In the SM approach, on the other hand, we can distinguish the case in which both positions vary independently, [... x ... y ...], from the case in which they vary in unison, [... x ... x ...].

We conclude that general considerations of parsimony should favor the AS approach, as the null hypothesis, over the SM approach. In addition, the apparent lack of island sensitivity should constitute a specific argument against the SM approach.

However, AS has to face several problems that may tell us that this format is not expressive enough to model focus in natural language. One, which was observed already by Rooth (1985), §2, footnote 13, and is discussed in Blok (1993), is that alternative semantics does not always give us the right interpretation even if couched in an intensional framework. Rooth mentions an example similar to the following one:

(14) *Nine only is the square of thrée_F.*

This sentence should be false if the domain includes negative numbers, as nine is also the square of minus three. But it has a true interpretation under the intensionalized version of (11), as the meanings of *the square of three* and *the square of minus three* are the same in all possible worlds – all possible worlds have to obey the laws of mathematics. The structured meaning approach has no problem here, as the meanings of *three* and *minus three* are different.

Another problem of AS, as pointed out in Krifka (1992), arises when we consider multiple focus, such as in the following case:

(15) *John only introduced Bill_F to Sue.*

John also₂ only₁ [introduced Bill_{F1} to Máry_{F2}]

The coindexation should indicate the natural reading of the second sentence, saying ‘John introduced only Bill to Mary, and that there is another person besides Mary such that John introduced only Bill to that person’. Pure AS cannot capture this interpretation, as it cannot identify distinct variables. In AS, the first operator *only* would associate with both foci, on *Bill* and *Mary*, leaving no focus to associate with *also*.

Kratzer (1994) points out the following problem that results from the impossibility of coindexation. Consider the following example, in which focus and VP ellipsis interact:

- (16) A: *What a copycat you are!*
You went to Block Island because I did,
and you went to Tanglewood because I did.
B: *No, I only went to Tanglewood_F because you did.*

Standard assumptions about VP ellipsis tell us that B's reply should be spelled out as follows:

- (17) *I only [went to Tanglewood_F because you went to Tanglewood_F].*

The only way for pure AS to handle these two foci is that the alternatives, Block Island and Elk Lake Lodge, are introduced in each of the two focus positions independently. But this does not give us the right interpretation. The interpretation AS provides for (17) can be paraphrased as: Of the propositions

- (a) 'I went to Block Island because you went to Block Island'
- (b) 'I went to Block Island because you went to Tanglewood'
- (c) 'I went to Tanglewood because you went to Block Island'
- (d) 'I went to Tanglewood because you went to Tanglewood',

only proposition (d) is true. However, (16) is naturally understood in a way that only propositions (a) and (d) are alternatives. This reading can be achieved in the SM approach if *only* associated with both foci in (17).

- (18) *I only₁ [went to Tanglewood_{F,1} because you went to Tanglewood_{F,2}]*

A related problem was pointed out by von Stechow (1990), who attributes it to Thomas Ede Zimmermann. It concerns the inability to express any relation between focus values in AS, not just identity. Assume that John gives a formal dinner party. As such parties go, he is obliged to introduce every person to his or her designated partner at table. Assume that the party just started; we have four guests, namely Bill and Sue (who are designated partners) and Charles and Lucy (who are designated partners). John has already introduced Bill to Sue, and Bill to Lucy. At this point, question (19.A) can be truthfully answered by (19.B):

- (19) A: *Did John introduce every gentleman to his partner at table?*
B: *No, John only introduced Bill_F to Sue_F.*

This says: ⟨Bill, Sue⟩ is the only pair of partners-at-table such that John introduced the first to the second. John's introducing Bill to Lucy does not count, as ⟨Bill, Lucy⟩ is not a pair of partners-at-table, and hence not an alternative. Pure AS cannot express this restriction on paired foci, as it introduces the alternatives in each focus position separately. The SM approach, on the other hand, can identify Bill and Sue and combine them to a pair, a process that has been called absorption (cf. Higginbotham and May (1981) for similar cases with multiple questions).

These problems with AS suggest that the simple representation framework that it offers for association with focus is too simple. But then we still face the problem of the apparent lack of island sensitivity of association with focus. In the following, we will discuss this in greater detail.

2. A Hybrid Theory of Association with Focus

2.1. Association with Focus Phrases

I will explore the idea that association with focus is, in fact, sensitive to syntactic islands, following Drubig (1994). An apparent counterexample like (8), repeated here as (20), which results in an LF that violates island restrictions under the current theory, is interpreted as involving the LF (20.b), in which the focus-sensitive operator associates with the syntactic island that contains the focus. I will call the indexed constituent the **focus phrase** (FP).

- (20) a. *only introduced* [*the man that Jill_F admires*]_{FP} *to Sue*
 b. *only* [[*the man that Jill_F admires*]₁ [*introduced t₁ to Sue*]]

For another example of this type, consider the following:

- (21) a. *only liked* [*the man that introduced Bill_F to Sue*]_F
 b. *only* [[*the man that introduced Bill to Sue_F*]_{FP} [*liked t₁*]]

Association with the syntactic island containing the focus, a case of pied-piping on LF, makes the focus visible to the focus-sensitive operator without violating syntactic island restrictions.

But this can only be part of the story: We still have to explain the contribution of the focus within the focus phrase. For example, the dif-

ferent readings of expressions like the following ones have to be accounted for:

- (22) a. *only liked* [*the man that introduced Bill_F to Sue*]_{FP}
 b. *only liked* [*the man that introduced Bill to Sue_F*]_{FP}

The truth-conditional content of these expressions is different: In the first case, the alternatives are men that introduced someone to Sue; in the second, the alternatives are men that introduced Bill to someone. The assignment of the focus within the focus phrase does matter, even if the focus operator does not associate with it directly.

2.2. The Role of Focus in the Focus Phrase

I would like to propose that the focus within the focus phrase determines the alternatives of the focus phrase, in the manner indicated in Alternative Semantics (see Krifka (1996) for a first presentation of this idea). Then the alternative sets of the two focus phrases in (22.a,b) are distinct: In the first case, the alternatives are men that introduced someone to Sue; in the second, the alternatives are men that introduced Bill to someone.

- (23) a. $\llbracket [\textit{the man that introduced Bill}_F \textit{ to Sue}]_{FP} \rrbracket^A$
 $= \{ \iota x [\text{MAN}(x) \wedge \text{INTROD}(\text{SUE})(y)(x)] \mid y \in \text{ALT}(\text{BILL}) \}$
 b. $\llbracket [\textit{the man that introduced Bill to Sue}_F]_{FP} \rrbracket^A$
 $= \{ \iota x [\text{MAN}(x) \wedge \text{INTROD}(y)(\text{BILL})(x)] \mid y \in \text{ALT}(\text{SUE}) \}$

Combining this with the interpretation of *only* in the Structured Meaning approach given in (4), we get the following interpretations for sentences containing the VPs (22.a) and (b):

- (24) $\llbracket [\textit{John only} \llbracket [\textit{the man that introd. Bill}_F \textit{ to Sue}]_{FP} \rrbracket_1 \llbracket \textit{liked } t_1 \rrbracket \rrbracket$
 $= \forall x \in \llbracket [\textit{the man that introd. Bill}_F \textit{ to Sue}] \rrbracket^A$
 $\quad [\text{LIKED}(x)(\text{JOHN}) \rightarrow x = \llbracket [\textit{the man that introd. Bill}_F \textit{ to Sue}] \rrbracket$
 $= \forall x \in \{ \iota x [\text{MAN}(x) \wedge \text{INTROD}(\text{SUE})(y)(x)] \mid y \in \text{ALT}(\text{BILL}) \}$
 $\quad [\text{LIKED}(x)(\text{JOHN}) \rightarrow x = \iota x [\text{MAN}(x) \wedge \text{INTROD}(\text{SUE})(\text{BILL})(x)]]$
- (25) $\llbracket [\textit{John only} \llbracket [\textit{the man that introd. Bill to Sue}_F]_{FP} \rrbracket_1 \llbracket \textit{liked } t_1 \rrbracket \rrbracket$
 $= \forall x \in \llbracket [\textit{the man that introd. Bill to Sue}_F] \rrbracket^A$
 $\quad [\text{LIKED}(x)(\text{JOHN}) \rightarrow x = \llbracket [\textit{the man that introd. Bill to Sue}_F] \rrbracket$
 $= \forall x \in \{ \iota x [\text{MAN}(x) \wedge \text{INTROD}(y)(\text{BILL})(x)] \mid y \in \text{ALT}(\text{SUE}) \}$
 $\quad [\text{LIKED}(x)(\text{JOHN}) \rightarrow x = \iota x [\text{MAN}(x) \wedge \text{INTROD}(\text{SUE})(\text{BILL})(x)]]$

The two formulas express distinct truth conditions. Consider a situation in which Greg introduced Bill to Sue, George introduced Ben to Sue, Glen introduced Bill to Sigrid, and John likes Greg and Glen but not George. In this case, (24) is true because among the men that introduced someone to Sue, John only likes Greg, and (25) is false because among the men that introduced Bill to someone, John does not only like Greg but also Glen.

Modeling the contribution of the focus in terms of AS predicts that there is no syntactic island restriction, that is, that there is no restriction for the depth at which the focus can be imbedded within the focus phrase. This is indeed the case, as the following example shows:

- (26) a. *John only remembered [the dog [owned by the man [that introduced Bill_F to Sue]]]]_{FP}*
 b. *John only remembered [the dog [owned by the man [that introduced Bill to Sue_F]]]]_{FP}*

The alternatives in the first case are dogs owned by men that introduced some alternative to Bill to Sue, whereas the alternatives in the second case are dogs owned by men that introduced Bill to some alternative to Sue. It appears that the focus that generates alternatives can be embedded at an arbitrary depth within the focus phrase.

3. Three Unconvincing Arguments for Hybrid Focus Association

Hybrid association with focus is more complex than either the simple AS approach and the simple SM approach. Its proponents will have to come up with arguments in favor of it, compared to other approaches. In this section we will discuss three potential arguments that turn out, upon closer inspection, not to be convincing. In the following section we will then turn to three more valid ones.

3.1. Overt Focus Movement

In many cases, focus constituents are moved overtly. This is the case in languages that have dedicated focus positions, like Hungarian. In English, as in many other languages, cleft constructions involve overt focus movement:

- (27) *It was [Máry_F]₁ who₁ John met t₁.*

If focus is in a syntactic island, the whole island undergoes movement:

- (28) *It was*
[[*the man who offered [a béér]_F to Sue*]₁[[*that John met t₁*]].

This may seem to be evidence that cleft constructions do not identify the focus, but the focus phrase. In cases like (27), focus and focus phrase happen to coincide, but when they differ, as in (28), the construction applies to the focus phrase. Apparently, focus-sensitive operators associate with focus phrases.

This conclusion, however, is premature, as the pied-piping illustrated in (28) may be enforced by requirements of overt syntactic movement quite independent of the nature of association with focus.

There is one phenomenon that may bear on the issue whether pied-piping happens just for syntactic reasons. Overt movement out of islands can sometimes be saved by using resumptive pronouns, as illustrated in the following topicalization constructions.

- (29) a. [*This drink*]₁, *I offered t₁ to Sue.*
b. **[This drink]₁, I met the man that offered t₁ to Sue.*
c. *This drink₁, I met the man that offered it₁ to Sue.*

But the resumptive pronoun strategy does not work for *it*-clefts:

- (30) **It was [this drink]_{F,1} that I met [the man who offered it₁ to Sue].*

There is no genuinely syntactic problem with relating *this drink* to *it* here, and so association with focus in an island itself may be the problem.

However, the resumptive pronoun strategy is not an instance of movement in the first place, but of anaphoric binding. It appears that *it*-clefts, in contrast to topicalization, must involve movement, not anaphoric binding. This is indeed the case:

- (31) a. [*This drink*]₁, *I offered it₁ to Sue.*
b. **It was [this drink]_{F,1} that I offered it₁ to Sue.*

In conclusion, it seems that overt focus movement cannot provide us with arguments that association with focus, by its very nature, is subject to island restrictions.

3.2. Explicit Restrictions of Alternatives

In this section we will discuss potential evidence for focus phrases that cannot be explained as properties of overt syntactic movement. Consider the following sentence:³

(32) *Of Mary's relatives, Sue only likes Bill_F.*

This example allows that Sue likes other persons than Bill, provided they aren't relatives. That is, the *of*-phrase in (32) restricts the set of alternatives of the expression in focus.

We find *of*-phrases related to expressions in focus that are not associated with any focus-sensitive operators. Again, they seem to restrict the set of alternatives of a focus. In (33.a), Bill must be a relative of Mary, and in (33.b), Sue must be a relative of Mary.

(33) a. *Of Mary's relatives, Sue likes Bill_F.*
b. *Of Mary's relatives, Súe_F likes Bill.*

When we consider examples in which the focus is embedded in a syntactic island with respect to the focus-sensitive operator, we find that the restrictive phrases corresponds to the focus phrase, and not to the focus:

(34) *Of Mary's relatives,
Sue only likes [the man that Bill_F introduced to her]_{FP}.*

Example (34) is understood as implying that the man that Bill introduced to Sue is a relative of Mary, not that Bill is a relative of Mary. It presupposes that there are other men that someone introduced to Sue that are relatives of Mary, but that Sue does not like them. We can see this again as evidence for the crucial role of focus phrases in association with focus, hence for an LF movement analysis.

However, consideration of a wider range of data casts doubt on this argument. First, the data are not quite clear in cases in which the reading that should not exist is enforced by selectional properties of the verbs.

(35) a. *Of Mary's students,
Sue only liked the book that Bill_F checked out.*
b. *Of Mary's students,
Sue only liked the paper that Bill_F presented.*
c. *Of Joyce's novels, Sue only knows people that like Ulysses.*

While (35.a) is generally judged bad, some speakers find (35.b) or (35.c) acceptable. One factor that certainly plays a role in (35.b) is that we can identify students with their papers in certain contexts (e.g., *Of all my students, this is the only good paper*). Another factor that may be at stake is that in certain cases, *of*-phrases can be understood as topics, similar to *as for*-phrases. Such phrases do not require a related phrase that is in focus, cf. (36.a), but they are compatible with related phrases that are in focus, cf. (36.b), and the relation itself is not subject to island restrictions, cf. (36.c).

- (36) *As for Joyce's novels,*
a. *most students dislike them.*
b. *most students only like Ulysses_F.*
c. *I have met someone who likes Ulysses.*

Secondly, we should make sure that it is not the postulated relation between the *of*-phrase and its correlate that is island sensitive. The data indicate that exactly this might be the case:

- (37) a. *Of Mary's relatives,*
Sue talked to [a man who only knew Bill_F reasonably well].
b. *Of the famous Dutch painters,*
I visited a museum that only had paintings by Van Gogh_F.

Both sentences are quite marginal⁴. Hence it appears that *of*-phrases abide by an independent restriction when relating to some focused element that is an immediate argument of the clause they adjoin to. This would already suffice to explain the observation made in (34): *of Mary's relatives* is not related to the NP *the man that Bill_F introduced to her* because it is the focus phrase of *only* but because it could not relate to an expression within a syntactic island.

I conclude from the discussion in this section that we cannot take the behavior of *of*-phrases as evidence for association with focus phrases.

3.3. The Problem of the Only Child

In this section we discuss a potential problem for direct association with focus that relates to the interpretation of sentences with focus-sensitive operators. It was brought up first in Krifka (1996). Consider the following example, in which focus appears within a relative clause.

- (38) a. *Sam only talked to Bill_F's mother.*
 b. *Sam [only [Bill] _i [talked to t_i's mother]]*
 c. $\forall y \in \text{ALT}(\text{BILL})[\text{TALK TO}(\text{MOTHER}(y))(\text{SAM}) \rightarrow y = \text{BILL}]$

The interpretation can be paraphrased as follows: ‘The only y among the alternatives to Bill such that Sam talked to y 's mother is $y = \text{Bill}$ ’. This excludes, for example, that Bill’s mother is also the mother of John, if John is an alternative. But (38.a) does not seem to entail that Bill is an only child. Consider the following context. It is parents meeting of the elementary school, and most parents know each other just by way of the friends of their kids. In this situation there is nothing odd with the following utterance by Sue, even though she knows that the mother of Bill is also the mother of John:

- (39) *I talked to some of the fathers, but not so much to the mothers.*
In fact, I only talked to Bill_F's mother.

Sue just described the mother she talked to by way of her being the mother of Bill. She could have used other characterizations, like *Ms. Smith*, or *the woman I talked to last time*, or also *John's mother*.

The problem, which I called “the problem of the only child”, also appears in the AS approach, which will give us the following interpretation:

- (40) a. *Sam only talked to Bill_F's mother.*
 b. $\forall P \in \{ \lambda i [\text{TALK TO}(i)(\text{MOTHER}(i)(x))] \mid x \in \text{ALT}(\text{BILL}) \}$
 $[\text{P}(i^*)(\text{SAM}) \rightarrow \text{P} = \lambda i [\text{TALK TO}(i)(\text{MOTHER}(i)(\text{BILL}))]]$

This says that for all properties P of the type ‘talk to x 's mother’, where x varies over alternatives of Bill, if P applies to Sam in the real world i^* , then P is the property ‘talk to Bill’s mother’. Now, the intensions of $\lambda i [\text{MOTHER}(i)(\text{BILL})]$ and $\lambda i [\text{MOTHER}(i)(\text{JOHN})]$ that count in the construction of these properties are different. Even if the mother of Bill is also the mother of John in the actual world, Bill and John might have different mothers. Consequently, ‘talk to Bill’s mother’ and ‘talk to John’s mother’ are different properties. Hence, under the circumstances of (39), (40.b) is false because the alternative $\text{P} = \lambda i [\text{TALK TO}(i)(\text{MOTHER}(i)(\text{JOHN}))]$ is true of Sam as well.

The solution to the problem of the only child proposed in Krifka (1996) was to assume association with focus phrases. Instead of (38) we have the following logical form and interpretation:

- (41) a. *Sam only talked to [Bill_F's mother]_{FP}.*
 b. *Sam [only [Bill_F's mother]_i [talked to t_i's mother]]*
 c. $\forall y \in [[\text{Bill}_F \text{'s mother}]]^A [\text{TALK TO}(y)(\text{SAM}) \rightarrow y = \text{MOTHER}(\text{BILL})]$

This says that among all alternatives y to Bill's mother (that is, among all the persons that are mothers of alternatives of Bill), if Sam talked to y , then y is the mother of Bill. If Bill's mother is also John's mother, then this does not constitute a problem under this representation.

However, it turns out that so far we only dealt with one possible interpretation. Consider the following example: After some traumatic event a school psychologist has to talk to the mothers of all the students in a class. The psychologist just gets hold of the mother of Bill and John, who are both in the class.

- (42) Director: *I've heard you only talked to Bill_F's mother so far.*
 Psychologist: *That's not quite right, I haven't only talked to Bill_F's mother, I have also talked to John_F's mother, they have the same mother.*

In this case it is crucial that the mothers should be accessed through their kids. In a sense, 'Bill's mother' and 'John's mother' constitute different cases, even though they happen to be the same person.

This is clearly an instance of a de re / de dicto ambiguity. Under the de-re reading, *Bill's mother* and *John's mother* count as the same person; under the de dicto reading, they are different. If we assume individual concepts, functions from possible worlds to individuals, as semantic values of expressions, then the concepts *Bill's mother* and *John's mother* denote different concepts, as there are possible worlds in which Bill and John have different mothers.

This would help us to get the two readings within the interpretation illustrated in (41). In the de-re case (43.a), the alternative set consists of individuals, and Bill's mother and John's mother are the same individual. In the de-dicto case (43.b), the alternative set consists of individual concepts, and Bill's mother and John's mother are different individual concepts.

- (43) a. $\forall u \in \{ \text{MOTHER}(i^*)(y) \mid y \in \text{ALT}(\text{BILL}) \}$
 $[\text{TALK TO}(i^*)(u)(\text{SAM}) \rightarrow u = \text{MOTHER}(\text{BILL})]$
 b. $\forall x \in \{ \lambda i [\text{MOTHER}(i)(y)] \mid y \in \text{ALT}(\text{BILL}) \}$
 $[\text{TALK TO}(i^*)(x(i^*))(\text{SAM}) \rightarrow x = \lambda i [\text{MOTHER}(i)(\text{BILL})]]$

I assumed here that u is a variable over individuals, and x is a variable over individual concepts.

But even with the AS approach to association with focus illustrated in (40) the assumption of a de-re / de-dicto ambiguity would provide us with the two readings:

- (44) a. $\forall P \in \{\lambda i[\text{TALK TO}(i)(\text{MOTHER}(i^*)(y)) \mid y \in \text{ALT}(\text{BILL})]\}$
 $[\text{P}(i^*)(\text{SAM}) \rightarrow P = \lambda i[\text{TALK TO}(i)(\text{MOTHER}(i^*)(\text{BILL}))]]$
 b. $\forall P \in \{\lambda i[\text{TALK TO}(i)(\text{MOTHER}(i)(x)) \mid x \in \text{ALT}(\text{BILL})]\}$
 $[\text{P}(i^*)(\text{SAM}) \rightarrow P = \lambda i[\text{TALK TO}(\text{MOTHER}(i)(\text{BILL}))]]$

In conclusion, this shows that the problem of the only child cannot be used for deciding between the SM approach and the AS approach. Both approaches are able to represent the two possible readings that appear in such examples.

4. Three Valid Arguments for Hybrid Focus Association

In this section I will discuss three arguments for hybrid association for focus that appear to be more convincing: Explicit contrasts, multiple foci in syntactic islands and answers to constituent questions in which the wh-element occurs in a syntactic island.

4.1. Explicit Contrasts

Drubig (1994) discusses cases of explicit contrast as evidence for island-sensitivity of association with focus. In English, such expressions are marked by *but* and involve focus-sensitive negation. The contrasting expression is in focus as well.

- (45) a. *Mary didn't invite Jóhn_F to the party, but she invited Bíll_F.*
 b. *Mary didn't invite Jóhn_F to the party, but Bíll_F.*

The first clause in (45.a,b) asserts that Mary didn't invite John to the party, and presupposes that she invited some alternative of John; the clause headed by *but* then asserts that she invited Bill (who must be one of the focus alternatives). Due to this semantics, the focus-background structures of the two clauses must correspond to each other. The *but*-clause can undergo ellipsis; in (45.b), it is reduced to the focus element itself.

Now, Drubig (1994) points out that complete reduction is blocked in case the focus of the first clause is properly contained within a syntactic island. In (46), continuations (a) and (b) are possible, but (c,d,e) are excluded. The generalization is that the *but*-phrase must contain at least a phrase that corresponds to the focus phrase of the first clause.

- (46) *Mary didn't invite [the man in a bláck_F suit]_{FP} to the party,*
 a. *but she invited the man in a púrple_F suit.*
 b. *but the man in a púrple_F suit.*
 c. **but in a púrple_F suit.*
 d. **but a púrple_F suit.*
 e. **but púrple_F.*

In contrast to cases that involve overt focus movement discussed in the previous section, there is no other obvious culprit for these grammaticality contrasts than the nature of association with focus itself. If focus-sensitive negation associates with a focus phrase, then it is natural to assume that the *but*-phrase must contain a constituent that corresponds to the focus phrase. The following logical form illustrates this for (46.b).

- (47) LF: *Mary*
 $[[\text{didn't } [the\ man\ in\ a\ bláck_F\ suit]_{FP}]_1 [invite\ t_1\ to\ the\ party]]$
 $[but\ [the\ man\ in\ a\ púrple_F\ suit]_{FP}]$

The constituent headed by *but* must contain a focus phrase that corresponds to the focus phrase of the preceding clause. If focus marking is absent within the constituent headed by *but*, the sentence is ungrammatical, cf. (48.a). Also, the focus must correspond to the focus in the first clause, cf. (b), and the non-focused material must stay the same, cf. (c).

- (48) *Mary didn't invite the man in a bláck_F suit,*
 a. **but (she invited) the man in a purple suit.*
 b. **but (she invited) the wóman_F in a black suit.*
 c. **but (she invited) the woman in a púrple_F suit.*

How are sentences like (47) interpreted? I suggest the following general rule:

- (49) $[[\text{didn't } [FP\ B]]]$
 $= \lambda x[\neg[[B]]([FP])(x)]$
 $\wedge \text{presupposed: } \exists Y \in [[FP]]^{\wedge} [[B]](Y)(x)]$

The logical form of our example can be rendered as follows:

- (50) $[[Mary\ [\text{didn't } [[the\ man\ in\ a\ bláck_F\ suit]]_1 [invite\ t_1]]]]$

Applying rule (49), we get the following interpretation:

$$(51) \quad \neg[[\text{I}_1[\text{invite } t_1]]](\llbracket \text{the man in a black}_F \text{ suit} \rrbracket)(\llbracket \text{Mary} \rrbracket) \\ \wedge \text{presupp: } \exists y \in \llbracket \text{the man in a black}_F \text{ suit} \rrbracket^\wedge \\ \llbracket [\text{I}_1[\text{invite } t_1]](y)(\llbracket \text{Mary} \rrbracket) \rrbracket$$

The asserted part of (49) reduces to (52), saying that Mary did not invite the man in the black suit.

$$(52) \quad \neg[\text{INVITE}(\text{I}_y[\text{MAN}(y) \wedge \exists z[\text{BLACK}(z) \wedge \text{SUIT}(z) \wedge \text{IN}(z)(y)]])(\text{MARY})]$$

The presupposed part of (49) reduces to (53):

$$(53) \quad \exists y \in \{ \text{I}_y[\text{MAN}(y) \wedge \exists z[\text{P}(z) \wedge \text{SUIT}(z) \wedge \text{IN}(z)(y)] \mid \text{P} \in \text{ALT}(\text{BLACK})] \\ [\text{INVITE}(y)(\text{MARY})] \\ \approx \exists y \exists \text{P}[\text{P} \in \text{ALT}(\text{BLACK}) \wedge \text{MAN}(y) \wedge \exists z[\text{P}(z) \wedge \text{SUIT}(z) \wedge \text{IN}(z)(y)] \\ \wedge \text{INVITE}(y)(\text{MARY})] \}$$

That is, it is presupposed that there is another man in a suit that has a property that is an alternative to BLACK that Mary did invite. The second formula in (53) is a simplified paraphrase that neglects uniqueness of the man under the given description.

The *but*-phrase specifies the alternative that Mary invited. The general rule can be rendered as follows, for the case that the *but*-phrase heads the corresponding expression FP' to the focus phrase FP.

$$(54) \quad \llbracket [\text{didn't FP B}] [\text{but [FP']}]] \rrbracket \\ = \lambda x[\dots \text{ as before } \dots \\ \wedge \llbracket \text{B} \rrbracket(\llbracket \text{FP}' \rrbracket)(x) \wedge \text{presupposed: } \llbracket \text{FP} \rrbracket^\wedge = \llbracket \text{FP}' \rrbracket^\wedge]$$

Applied to our example, this adds the following parts to the representation in (51):

$$(55) \quad \llbracket [\text{I}_1[\text{invite } t_1]](\llbracket \text{the man in the purple}_F \text{ suit} \rrbracket)(\llbracket \text{Mary} \rrbracket) \wedge \\ \text{presupp: } \llbracket \text{the man in the black}_F \text{ suit} \rrbracket^\wedge \\ = \llbracket \text{the man in the purple}_F \text{ suit} \rrbracket^\wedge$$

The assertion part can be spelled out as in (56):

$$(56) \quad \text{INVITE}(\text{I}_y[\text{MAN}(y) \wedge \exists z[\text{PURPLE}(z) \wedge \text{SUIT}(z) \wedge \text{IN}(z)(x)]])(\text{MARY})$$

The presupposition part claims the equality (57):

$$(57) \quad \{ \text{I}_y[\text{MAN}(y) \wedge \exists z[\text{P}(z) \wedge \text{SUIT}(z) \wedge \text{IN}(z)(y)] \mid \text{P} \in \text{ALT}(\text{BLACK})] \} \\ = \{ \text{I}_y[\text{MAN}(y) \wedge \exists z[\text{P}(z) \wedge \text{SUIT}(z) \wedge \text{IN}(z)(y)] \mid \text{P} \in \text{ALT}(\text{PURPLE})] \}$$

In an intensional model, this amounts to saying that the alternatives of BLACK equal the alternatives of PURPLE: $\text{ALT}(\text{BLACK}) = \text{ALT}(\text{PURPLE})$.

This representation predicts that cases like (48.a,b,c) are ungrammatical, as can be easily seen. As an example, consider (48.a):

$$(58) \quad \begin{aligned} \text{a. } & \llbracket \text{the man in the } \textit{black}_F \text{ suit} \rrbracket^{\wedge} = \llbracket \text{the man in the } \textit{purple} \text{ suit} \rrbracket^{\wedge} \\ & \text{b. } \{ \iota y [\text{MAN}(y) \wedge \exists z [\text{P}(z) \wedge \text{SUIT}(z) \wedge \text{IN}(z)(y)]] \mid \text{P} \in \text{ALT}(\text{BLACK}) \} \\ & \quad = \{ \iota y [\text{MAN}(y) \wedge \exists z [\text{PURPLE}(z) \wedge \text{SUIT}(z) \wedge \text{IN}(z)(y)]] \} \end{aligned}$$

Even if we would allow for singleton alternative sets, the problem is that the meaning proper of *the man in the black_F suit* cannot be contained in this alternative set, provided that the meaning of *black* and *purple* differ.

It is an interesting issue how similar the two focus phrases have to be. Consider the following cases:

$$(59) \quad \begin{aligned} \text{a. } & \textit{John didn't read [the book that } \textit{Mary}_F \textit{ recommended}]_{\text{FP}}, \\ & \quad \textit{but Moby-Dick}_F. \\ \text{b. } & \textit{John didn't read Moby-Dick}_F, \\ & \quad \textit{but [the book that } \textit{Mary}_F \textit{ recommended}]_{\text{FP}} \end{aligned}$$

These sentences are fine in contexts in which *Moby-Dick* was recommended by an alternative to *Mary*. In such contexts, the following equation can be solved, if ALT is context dependent.

$$(60) \quad \begin{aligned} \text{a. } & \llbracket \text{the book that } \textit{Mary}_F \textit{ recommended} \rrbracket^{\wedge} = \llbracket \textit{Moby-Dick} \rrbracket^{\wedge} \\ \text{b. } & \{ \iota y [\text{BOOK}(y) \wedge \text{RECOMMENDED}(y)(x)] \mid x \in \text{ALT}(\text{MARY}) \} \\ & \quad = \text{ALT}(\text{MOBY-DICK}) \end{aligned}$$

For example, if $\text{ALT}(\text{MARY}) = \{\text{MARY}, \text{BILL}\}$, and if *Bill* recommended *Ulysses*, then the equation is satisfied for $\text{ALT}(\text{MOBY-DICK}) = \{\text{MOBY-DICK}, \text{ULYSSES}\}$.

We do not need association with focus phrase to express the proper truth conditions of contrasting negation plus *but*-phrase. Instead of the rule specified in (49)/(54), we could have stated the following rule in the SM framework, cf. (61), or in the AS framework, cf. (62).

$$(61) \quad \begin{aligned} & \llbracket \textit{didn't [F B] but [F']} \rrbracket \\ & = \lambda x [\llbracket \text{B} \rrbracket(\llbracket \text{F} \rrbracket)(x) \wedge \text{presupp: } \exists Y \in \text{ALT}(\llbracket \text{F} \rrbracket) [\llbracket \text{B} \rrbracket(Y)(x)] \\ & \quad \wedge \llbracket \text{B} \rrbracket(\llbracket \text{F}' \rrbracket)(x) \wedge \text{presupp: } \text{ALT}(\llbracket \text{F} \rrbracket) = \text{ALT}(\llbracket \text{F}' \rrbracket)] \end{aligned}$$

$$(62) \quad \begin{aligned} & \llbracket \textit{didn't VP but VP'} \rrbracket \\ & = \lambda x [\neg \llbracket \text{VP} \rrbracket(x) \wedge \text{presupp: } \exists Y \in \llbracket \text{VP} \rrbracket^{\wedge}(x) \\ & \quad \wedge \llbracket \text{VP}' \rrbracket(x) \wedge \text{presupp: } \llbracket \text{VP} \rrbracket^{\wedge} = \llbracket \text{VP}' \rrbracket^{\wedge}] \end{aligned}$$

Hence, nothing requires association with focus phrases in the semantic interpretation. Consequently, it is arguably the mechanism of how focus information is made available to negation that makes it impossible to

associate *didn't* directly with the focus. This appears to be good evidence that focus-sensitive operators associate with the focus phrase, and only indirectly with the focus.

In the examples discussed so far, the focus was located in a complex noun phrase. Other types of islands, such as embedded interrogatives, show a similar result (cf. also Meinunger (1995)):

(63) **What_{t1} does Mary wonder [who saw t₁] yesterday?*

(64) *Mary doesn't wonder [who saw Bill_F] yesterday,*

a. *but who saw Jóhn_F.*

b. **but Jóhn_F.*

A particularly instructive case is provided by sentence-embedding verbs. Factive verbs like *know* create islands, whereas non-factive ones do not:

(65) *Who_{t1} does Mary {think / *know} that Sue saw t₁ yesterday?*

As predicted, *but*-phrases must correspond to the embedded clause in case it is embedded by a factive verb:

(66) *Mary doesn't think that Sue saw Bill_F yesterday,*

a. *but that Sue saw Jóhn_F.*

b. *but Jóhn_F.*

(67) *Mary doesn't know that Sue saw Bill_F yesterday,*

a. *but that Sue saw Jóhn_F.*

b. **but Jóhn_F.*

So far we have looked at *but*-phrases as examples of constituents in explicit contrast. There are other ways to express contrast. For example, we find that clauses with *only* often occur with a negatively marked contrastive phrase.

(68) *Mary only invited Bill_F to the party, not Jóhn.*

Again we find that, if there is a difference between focus and focus phrase, then the contrasted expression corresponds to the focus phrase and not to the focus:

(69) *Mary only invited the man who was wearing a bláck suit,*

a. *not the man who was wearing a púrple_F suit.*

b. **not a púrple suit.*

c. **not púrple.*

Hence it appears that contrastive expressions correlate with focus phrases, lending support to the role of focus phrases in the interpretation of sentences with focus-sensitive operators.

4.2. Multiple Foci in Syntactic Islands

One prediction of the hybrid theory of association with focus phrases is that it should not be possible that two focus-sensitive operators relate to two distinct foci in the same syntactic island. This is because according to the hypothesis, the operators do not relate to the focus directly, but to the island containing the foci, the focus phrase. If one operator associates with the focus phrase, the focus phrase will become inaccessible to the other operator. That is, the configuration (70.a) is allowed, whereas the configuration (70.b) is excluded.

- (70) a. $FO_i FO_j [...[...F_j...]_{\text{Island}} \dots [...F_i...]_{\text{Island}} \dots]$
b. $*FO_i FO_j [... [...F_j \dots F_i \dots]_{\text{Island}} \dots]$

The relevant data are not easy to judge because instances of multiple focus are complicated to begin with, and even more so when we embed foci in islands. I will give a number of examples that I have used to test intuitions. In general, they construct cases of multiple focus with the help of a lead sentence that introduces one association, and then proceed with a sentence in which a second association is established on top of that. In (71) – (73), the (b) examples are cases in which the two foci occur in the same island, whereas the (a) examples have at least one interpretation in which the foci do not occur in the same island.⁵

- (71) a. *He only recommended the woman that had rescued the orphan_F children from Somalia to the prime minister. Also, he only recommended [the woman that had rescued the orphan_F children from Somalia] to the président_F.*
b. *He only recommended the woman that had rescued the orphan_F children from Somalia to the prime minister. Also, he only recommended [the woman that had rescued the orphan_F children from Eritréa_F] to the prime minister.*

- (72) a. *Of all the people in her audience,
Jaqueline only introduced [the girl that presented flówers_F
to John F. Kennedy.
She also only introduced [the girl that presented flówers_F]
to Bóbb_F Kennedy.*
- b. *Of all the girls that presented something to her husband,
Jaqueline only remembers the girl that presented flówers_F to
John F. Kennedy.
She also only remembers [the girl that presented flówers_F
to Bóbb_F Kennedy].*
- (73) a. *We only offered the diary entries that Mária_F made
to John F. Kennedy.
We also only offered [the diary entries that Mária_F made]
to Bóbb_F Kennedy.*
- b. *We only copied the diary entries that Mária_F made
about John F. Kennedy.
We also only copied [the diary entries that Mária made
about Bóbb_F Kennedy].*

If focus operators associate with focus phrases in the manner discussed here, the (b) examples should be ungrammatical, in contrast to the (a) examples. In general, the (a) sentences are indeed judged better than the (b) sentences. But the judgements are not very clear, probably because already the (a) examples posit extreme challenges to our interpretational facility. Given that, it appears that the (b) examples are worse in comparison. That judgements can be tricky is illustrated with a variant of (73.b), which is judged grammatical in Rooth (1995) even though it appears that two foci are located in the same syntactic island:

- (74) *We only discovered the diary entries that Mária_F made
about John F. Kennedy.
We also only discovered the diary entries that Mária made
about Bóbb_F Kennedy.*

But notice that the *about* phrase could be understood as an adjunct to *discovered*, as in *we discovered this about Bobby Kennedy*. In this parse, *about Bobby Kennedy* is not contained in the object NP in (74).

4.3. Short Answers to Questions

One prominent function of accent is to mark the focus-background structure of an answer to a question. By this, (76.a) is a suitable answer to (75.a) and (76.b) is a suitable answer to (75.b), but not vice versa.

- (75) a. *Who did John introduce t_1 to Sue?*
 b. *Who did John introduce Bill to t_1 ?*
- (76) a. *John introduced $Bill_F$ to Sue.*
 b. *John introduced Bill to Sue_F .*

One way of establishing this question-answer congruence in the SM theory is to assume that constituent questions and answers to such questions lead to structured meanings that should correspond to each other (cf. von Stechow (1991)). We then have representations like the following ones:

- (77) LF: [*who* ₁ [*John introduced t_1 to Sue*]]
 Meaning: QUEST(\langle PERSON, λ_{x_1} [INTROD(SUE)(x_1)(JOHN)] \rangle)
- (78) LF: [*Bill* ₁ [*John introduced t_1 to Sue*]]
 Meaning: ANSW(\langle BILL, A, λ_{x_1} [INTROD(SUE)(x_1)(JOHN)] \rangle)

This suggests the following general interpretation rule for congruent question-answer pairs in the SM approach:

- (79) A pair QUEST(\langle W, B \rangle) – ANSW(\langle F, A, B' \rangle) is congruent iff:
 B = B' and $W \subseteq A$ (or $W = A$).
 If congruent, the answer asserts that out of the elements X of A, it holds for $X=F$ that B(X).

The condition $W \subseteq A$ is suggested by question-answer pairs such as *Which student did John talk to? – John talked to $Bill_F$* , where the question alternatives W are restricted to students, and the answer alternatives may, in principle, be less restricted. Another option is to require $W = A$, where both the question alternatives W and the answer alternatives A may be restricted contextually. Often, F will be the only element X with the property that B(X) holds, but this is arguably a pragmatic implicature, not part of the meaning of the answer. If the two backgrounds are not the same, as in the pairing of (75.a) with (76.b), the answer is not congruent with the question. The identity of backgrounds allows for short, or term answers, in which the background of the answer is deleted and

which effectively specify only the element corresponding to the wh-phrase of the question:

- (80) Question: *Who did John introduce to Sue?*
 Answer: *Bill_F.*

This treatment may suggest that term answers just specify the semantic value of the argument that the background of the question should be applied to. However, there is evidence that term answers involve ellipsis, consisting in deletion or non-realization of the background of the answer. For example, the syntactic case is maintained in short answers:

- (81) Question: *Who did John introduce to Sue?*
 Answer: *Hím_F.* / **Hé.* (accompanied by pointing gesture).

This shows that even short answers are based on complete ones which are shortened by ellipsis. Basically, all expressions except the focus can be deleted.

- (82) SS: ~~*John introduced*~~ *hím_F to Sue.*
 LF: [*hím_F* _I [*John introduced t_I to Sue*]]

Question-answer congruence can also be expressed in the AS framework; see Rooth (1992) and von Stechow (1990) for a proposal. Following the theory of question interpretation of Hamblin (1973), the wh-element in the question introduces alternatives of the appropriate type that are projected to the sentence level. An answer is congruent if its alternatives are a superset of the question meaning, or, alternatively, if the alternatives of the answer and the meaning of the question are identical, if these sets are contextually restricted.

- (83) A pair $Q - A$ is congruent iff $\llbracket Q \rrbracket \subseteq \llbracket A \rrbracket^A$ (or $\llbracket Q \rrbracket = \llbracket A \rrbracket^A$).

By this criterion, the following pair is congruent:

- (84) a. $\llbracket \textit{Who did John introduce to Sue?} \rrbracket$
 $= \{ \text{INTRODUCE}(\text{SUE})(x)(\text{JOHN}) \mid x \in \text{PERSON} \}$
 b. $\llbracket \textit{John introduced Bill}_F \textit{ to Sue.} \rrbracket^A$
 $= \{ \text{INTRODUCE}(\text{SUE})(x)(\text{JOHN}) \mid x \in \text{ALT}(\text{BILL}) \}$

As in (82), all constituents except the focus constituent can be deleted.

Krifka (2001) argues that there are problems with the AS approach because it cannot systematically exclude over- or underfocused expressions. I will not repeat these arguments here but rather turn to cases of constituent questions in which the wh-element occurs within a syntactic island, and the answers to such questions (cf. also Reich 2001).

Languages that show overt movement of wh-elements appear to reflect the SM model of association with focus, just as in cleft sentences. Movement is syntactically restricted; if the wh-element occurs in an island, we observe pied-piping of the whole island:

- (85) a. **which novel* ₁[*did John introduce [the author of t₁] to Sue*]
b. [*the author of which novel*] ₁[*did John introduce t₁ to Sue*]

Of course, this cannot be taken as evidence for association with focus phrases in constituent questions: Pied piping might be solely motivated for syntactic reasons. But let us consider cases in which no overt syntactic movement is involved, that is, cases of wh-in-situ.

Nishigauchi (1990), using Japanese data, has argued that there is evidence for syntactic islands even for wh-in-situ languages (for a critical discussion of his implementation, see von Stechow (1996)). English has a number of in-situ strategies that allow us to test the same intuitions, in particular so-called echo questions, multiple questions, and alternative questions:

- (86) a. *John introduced [the author of which novel] to Sue?*
b. *Who introduced [the author of which novel] to Sue?*
c. *Did John introduce [the author of Uly'sses or Moby-Dick] to Sue?*

As Nishigauchi observes for Japanese, term answers to such questions correspond to the syntactic island in which the wh-element occurs, and not just to the expression in focus. The questions in (86.a,c) may be answered by (87.a) but not by (87.b), and the multiple question (86.b) may be answered with (87.c) but not with (87.d).

- (87) a. *The author of Uly'sses.* b. *Uly'sses.*
c. *Jóhn, the author of Uly'sses.* d. *Jóhn, Uly'sses.*

As before, these are short, elliptical answers that are the result of deletion. The material that can maximally be deleted is the material outside of the focus phrase, the phrase that has to be LF-moved to create a question meaning:

- (88) a. *John introduced [the author of which novel] to Sue?*
b. ~~*John introduced [the author of Uly'sses]_{FP} to Sue.*~~
c. LF: [*the author of Uly'sses*]_F ₁[*John introduced t₁ to Sue*]

Deletion up to the FP can be naturally stated for the SM account, as the FP has a specific function in this theory: It is the constituent that is

LF-moved, thus creating a structured meaning. It cannot be explained in the AS account, as there is no particular reason to single out this constituent. Rather, we would expect that everything except the focused constituent can be deleted, which makes the wrong prediction that answers like *Ulysses* are possible.

- (89) a. *John introduced [the author of which novel] to Sue?*
b. ~~*John introduced the author of Uly'sses_F to Sue.*~~

For quite similar reasons, the theory of deaccentuation of Schwarzschild (1999) would make the wrong prediction if we assume that deletion is an extreme form of deaccentuation. In the context of a question like (89), all constituents except *Ulysses* are given and should be candidates for deletion.

5. Conclusion

In this article we have discussed two grammatical architectures of association with focus phenomena: Structured Meanings and Alternative Semantics. While the simplicity and parsimony of AS makes this the null hypothesis, there are certain phenomena that indicate that the additional features of SM are required. We then turned to a phenomenon that argues against SM, and for AS, the apparent lack of island restrictions with association with focus. We have discussed potential evidence that association with focus is, as a matter of fact, subject to such restrictions. Three arguments turned out to be inconclusive on closer inspection: Overt focus movement, explicit restrictions of alternatives, and the *de re / de dicto* ambiguity in association with focus. But three other arguments provided more solid evidence for island restrictions in association with focus: Explicit contrasts, multiple foci in syntactic islands and elliptical answers to questions. Our conclusion, then, is that structured meanings are better suited than alternative semantics to represent association with focus. As we have also noticed that focus can be arbitrarily deeply embedded within a syntactic island, a hybrid theory of association with focus which works with structured meanings and projection of alternatives in the style of AS seemed to capture the observed phenomena best.

Notes

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2. Here, i is a variable over possible worlds, and verb meanings have a possible world argument. In the following, I will specify truth-conditions intensionally only when necessary for the point under discussion.
3. I thank Anna Szabolcsi for pointing out the relevance of *of*-phrases. Such phrases were also discussed by Irene Heim; Heim (1985) discusses cases that involve comparatives and the impossibility of focus within syntactic islands with examples like **Of these three towns, it is most rarely that Áustin_F is snowed in*, in contrast to *Of these three towns, the most interesting is Áustin_F*.
4. Notice that *of*-phrases differ in this respect from *as for*-phrases that express the topic of the sentence. Replacing the *of*-phrases by *as for Mary's relatives* or *As for the famous Dutch painters*, examples (37) are fine.
5. Thanks to Polly Jacobson and Mats Rooth for help in constructing some of the examples.

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