

Interpreting Focus under Negation

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1. Introduction

Positive sentences with focus can have a second component of meaning which is either negative or positive. Consider the example in (1), which states that John invited Pia and also that John did not invite any relevant alternative to Pia. We will refer to the first component of its meaning as the ‘A-component’: it is the meaning of the sentence without the focus-sensitive particle *only* (see (1a)). (The A-component of *only* is sometimes referred to as the prejacent, although this may not be an appropriate terminology for all A-components.) The second component, or ‘B-component’, is the interpretation that *only* contributes. It is given in (1b). In the case of *only*, the A-component is positive, while the B-component is negative: there is a negative operator in (1b) that is absent in (1a). We may therefore say that *only* contributes a ‘polar’ B-component. The example in (2) has the same positive A-component as (1), but in contrast to (1), its B-component is positive: John has invited at least one relevant alternative to Pia that he was more likely to have invited. We will call this kind of B-component ‘non-polar’.¹ (The examples in (1) and (2) are adapted from Krifka (1999). Here and below small caps are used to indicate focus.)

- (1) John invited *only* Pia.
a. [John invited Pia]
b. $\neg \exists F', F' \neq \text{Pia}, [\text{John invited } F']$
- (2) John invited *even* Pia.
a. [John invited Pia]
b. $\exists F', F' \neq \text{Pia}, [[[\text{John invited Pia}] <_{\text{likely}} [\text{John invited } F']]] \& [\text{John invited } F']]$

The main claim of this paper, given in (3), is that items that trigger a polar B-component cannot appear in a negative context:

- (3) Material contained in the c-command domain of (local) sentential negation at LF cannot give rise to a polar B-component.

So, if X is an item contributing a polar B-component, it can only appear in a positive context (which includes positions outside the scope of sentential negation). If the B-component contributed by X is non-polar, however, X can appear in both positive and negative contexts. This is summarised in the table below:

¹ We restrict our discussion here and below to focus-sensitive particles attached to DPs. We are aware that focus-sensitive particles may also attach to predicates, which may be preferred under certain circumstances, and that their interpretational effects in that case may be different. For example, *I invited even Pia* implies that the speaker invited someone else in addition to Pia, but *I even invited Pia* need not. The one exception we make is for *also*, which does not attach to a DP, so that we can only consider cases where it is attached to a predicate.

(4)

	<i>X contributes a polar B-component</i>	<i>X contributes a non-polar B-component</i>
<i>Positive context:</i> ... X ...	✓	✓
<i>Negative context:</i> ... ¬ ... X ...	✗	✓

The implication of this claim is that if X is contained in the scope of a local sentential negation at LF, and the semantics of X triggers a negative B-component, the sentence is ungrammatical.

Below we show that (3) correctly captures aspects of the distribution and interpretation of contrastive focus and DPs associated with the focus-sensitive particles *only*, *even*, *also* and *not Y but X* in negative sentences. Before we do so, however, there is some preparatory ground work that needs to be carried out. In section 2 we discuss the semantics of contrastive focus, focus-sensitive particles and *not Y but X*. In section 3 we consider restrictions on LF raising of these elements (which is important, as (3) holds at LF). The predictions of our proposal are discussed in detail in section 4. Section 5 concludes the paper.

2. Contrastive focus and focus particles

Suppose that a proposition P answers a *wh*-question Q. The focus of P is taken to be that part of P that corresponds to the *wh*-expression in Q. By this criterion, *Pia* is the focus in (5), while *John* is the focus in (6).

- (5) A: Who did John invite?
B: He invited Pia.

- (6) A: Who invited Pia?
B: JOHN invited Pia.

In English, focus attracts the main stress of the sentence (see Selkirk 1984, 1995, among many others). Thus, while the object carries sentence stress in (5), the subject does so in (6). It is infelicitous to deviate from these stress patterns.

A widely accepted analysis of question-answer congruence is proposed by Rooth (1985, 1992). Rooth assumes that the semantics of a question is the set of potential answers (see Hamblin 1973). So, the meaning of the question asked by A in (5) can informally be represented as the set in (7), while the meaning of the question in (6) corresponds to (8).

- (7) {[John invited Pia], [John invited Bill], [John invited Sarah], [John invited Tom], ...}

- (8) {[John invited Pia], [Joanna invited Pia], [Gerald invited Pia], [Jennifer invited Pia], ...}

Focus itself also evokes a set of alternative propositions, consisting of those that differ only in the focused position. This set is called the focus value of a sentence, in contradistinction to its ordinary value (the proposition expressed). Thus, the ordinary and focus values of the answers in (5) and (6) are as in (9) and (10), respectively:

- (9) a. *Ordinary value*: [John invited Pia].
 b. *Focus value*: {[John invited Pia], [John invited Bill], [John invited Sarah], [John invited Tom], ...}
- (10) a. *Ordinary value*: [John invited Pia].
 b. *Focus value*: {[John invited Pia], [Joanna invited Pia], [Gerald invited Pia], [Jennifer invited Pia], ...}

A congruent question-answer pair is one in which the focus value of the answer is identical to, or a subset of the meaning of, the question. Therefore, the focus marking in B's answer in (5) with the focus value in (9) fits the question asked, whose meaning is given in (7). However, A's question in (5) does not permit focus marking of the subject as in B's answer in (6).

We will use a notation that represents the meaning of (9) and (10) as triplets consisting of a function (corresponding to the background), the focus and a set of alternatives to the focus. This is reminiscent of the 'structured meanings' proposed by Krifka (2001). The ordinary value is generated by applying the function to the focus. For example, by applying *Pia* in (11) to λx [John invited x], we obtain the ordinary value 'John invited Pia'. The focus value is generated by applying the function to the focus as well as to the members of the set of alternatives. In (11), this yields the set of alternative propositions {[John invited Pia], [John invited Bill], [John invited Sarah], [John invited Tom], ...}.

(11) $\langle \lambda x$ [John invited x], Pia, {Bill, Sarah, Tom, ...} \rangle

(12) $\langle \lambda x$ [x invited Pia], John, {Joanna, Gerald, Jennifer, ...} \rangle

We propose that what we have called the A-component in Section 1 is in effect a triplet like (11) or (12). Since every sentence must have a focus, the semantics of every sentence will contain an A-component. This is true also of all-focus sentences. Take an exchange like *What happened?* – *John left*. The answer can be represented as below, using an identity function as the first member of the triplet:

(13) $\langle \lambda p.p$, John left, {Bill left, Mary played the piano, John sang, ...} \rangle

We turn next to the notion of contrast. There seems to be an interpretive difference between examples like (14) on the one hand, and examples like (5) and (6) on the other. In the former the focused constituent stands in opposition to an alternative explicitly mentioned in the discourse, while in the latter there is no explicit alternative and no sense of contrast. (Here and below we use italics to mark constituents that we take to have a contrastive reading.)

- (14) A: John invited Bill.
 B: (No, you're wrong.) He invited *PIA*.

So far, nothing in our system distinguishes a regular focus from a contrastive focus. It may well be that in certain cases the sense of contrast is only pragmatic. By general Gricean reasoning, the hearer infers that the answer to a *wh*-question he or she is asked will be complete. It therefore follows that alternative answers available in the context are taken to be false. Although this could be the right analysis for some cases (Krifka 2008), there are

instances of contrast that have grammatical effects and that are therefore unlikely to be entirely pragmatic in nature. For example, correction contexts such as (14) allow movement of the focused constituent, especially if the contrast is made explicit in the answer, as in (15). *Wh*-questions, however, do not normally provide a context compatible with focus movement in the answer, as (16) demonstrates (cf. Gundel 1974, Culicover 1991, É Kiss 1998).²

(15) A: John invited Bill.

B: No, you're wrong. *PIA* he invited. *BILL* he only saw briefly in the library.

(16) A: Who did John invite?

B: #*PIA* he invited.

B's answer in (16) is infelicitous on a non-contrastive reading. It is marked even when interpreted contrastively, because it presupposes an alternative to *Pia* that is not readily part of the common ground. B's answer is therefore likely to trigger a request for clarification, such as *What do you mean? Who did he not invite?* This effect can only be understood if the movement is linked to a contrastive reading.

Of course, as we have already seen in (13), a contrastive focus may remain in situ. A sentence with an in situ focus is therefore ambiguous between a regular focus interpretation and a contrastive focus interpretation. The effect of the movement is that it disambiguates the sentence: only the latter interpretation survives.³

The different behaviour of contrastive and regular focus is not limited to movement possibilities. In languages like Bole (West Chadic), for instance, the difference is expressed morphologically: there is a marker for contrastive focus that does not attach to regular focus (see Zimmermann 2008). There is arguably also a formal distinction in English. Contrastive focus is widely assumed to require the so-called A-accent (a plain high tone (H*), often followed by a default low tone; see Jackendoff 1972 and Pierrehumbert 1980), whereas regular focus on objects is marked with nuclear stress. The contrast between an A-accent and a nuclear stress may not be obvious in all contexts, but there is some evidence for the distinction (Beaver et al. 2007, Katz and Selkirk 2011, Selkirk 2008).

Any theory of focus must account for data like (15) and (16). The most conservative approach is to leave the standard theory of focus intact, but add something to it that accounts for the behaviour of contrastive focus. We propose that contrast, where it is linguistically encoded, contributes a polar B-component. An example like *PIA John invited* has an A-component asserting that John invited Pia and a B-component according to which there is at least one other person that John did not invite (here, Bill). In other words, there is a negative operator in the B-component that is absent in the A-component. (We have not applied lambda reduction in (17b), in order to highlight the fact that the B-component is generated using the very same λ -function present the A-component in (17a). In what follows, however, we will apply lambda reduction.)

² We are aware that some speakers do not allow fronting of a contrastive focus at all. For such speakers there is a strong tendency to assign a fronted item the so-called B-accent, maximally realised as L+H*, followed by L H%. This accent is often associated with an interpretation as a contrastive topic. For other speakers, there is a similar tendency, but it appears to be much weaker, amounting to not much more than a preference.

³ We assume that only alternatives that are salient in the discourse are included in the set of alternatives (see Wagner 2007 for discussion). This has the consequence that not all correction contexts permit the use of contrastive focus. In particular, *John invited nobody* does not provide a good context for a subsequent use of a contrastive focus, as in *#(No, you're wrong,) PIA he invited*. This is because the use of a contrastive focus in the second sentence implies that there is an alternative to Pia, but the context does not provide such an alternative.

- (17) *PIA* John invited.
 a. $\langle \lambda x[\text{John invite } x], \text{Pia}, \{\text{Bill}, \text{Sarah}, \text{Tom}, \dots\} \rangle$
 b. $\exists y, y \in \{\text{Bill}, \text{Sarah}, \text{Tom}, \dots\}, \lambda x \neg [\text{John invite } x](y)$

In sum, a B-component in the case of contrastive focus is composed of elements in the A-component, thus providing further information about the relationship between the ordinary value of a sentence and its alternatives. To be more precise, given an A-component $\langle \lambda x \Phi, \text{FOCUS}, \text{ALTERNATIVES} \rangle$, the template for constructing the B-component for contrastive focus is: $\exists y, y \in \text{ALTERNATIVES}, \lambda x \neg \Phi(y)$. The B-components triggered by focus-sensitive particles depend on the A-component in a similar manner, as we will show below.

We first turn to a construction that can be seen as an explicit means to mark the opposition between the selected and the rejected alternatives associated with a contrastively focused constituent. In the example in (18), the selected alternative is identified as *Pia* and the rejected one is *Bill*. We will refer to this construction as the *not Y but X* construction. In the semantics we adopt for this construction, the λ -function is applied to *X* in the A-component, and to *Y* in the B-component. In (18b), we indicate that *y* is selected from the set of alternatives to the focus, but since the *not Y but X* construction identifies the value of *y*, we omit this information henceforth.⁴

- (18) John invited not BILL but *PIA*.
 a. $\langle \lambda x[\text{John invited } x], \text{Pia}, \{\text{Bill}, \text{Sarah}, \text{Tom}, \dots\} \rangle$
 b. $\exists y, y \in \{\text{Bill}, \text{Sarah}, \text{Tom}, \dots\} \ \& \ y = \text{Bill}, \neg [\text{John invited } y]$

The contrastive nature of the object in (18) is confirmed by the fact that it can be fronted, as shown below.

- (19) Not BILL but *PIA* John invited.

Admittedly, the example in (19) is somewhat cumbersome, owing to the weight of the fronted item in comparison to what follows it. However, fronting becomes much easier if we choose a longer TP, as in *Not Bill but PIA John finally managed to invite*.

In (18) the semantic contribution of *not Bill* is represented as part of the B-component, while that of *Pia* appears in the A-component. In principle, it could be the other way around, as in (20), but in fact, this is not the correct interpretation. (We indicate this by !!.)

- (20) !!John invited not BILL but *PIA*.
 a. $\langle \lambda x \neg [\text{John invited } x], \text{Bill}, \{\text{Pia}, \text{Sarah}, \text{Tom}, \dots\} \rangle$
 b. $\exists y, y = \text{Pia}, \neg \neg [\text{John invited } y]$

⁴ One may be inclined to treat *not Y but X* as involving sentential coordination plus ellipsis. There are good reasons to reject such an analysis. First, the source for ellipsis is ungrammatical:

- (i) *He invited not BILL, but he invited *PIA*.
 (ii) *He invited not BILL, but *PIA* he invited.

Second, it is possible to have two occurrences of *not Y but X* in a single sentence:

- (iii) Not MARY but *JOHN* invited not BILL but *PIA*.

Although hard to interpret, the sentence is grammatical. It is unclear how it could be analysed using sentential coordination plus ellipsis.

One reason to reject this alternative representation has to do with the fact that constituent negation of the relevant type can only appear if coordinated with a contrastive focus:

(21) I know John invited someone. *But he invited not BILL.

If the semantics given in (20) were correct, the second sentence in (21) should be grammatical. On the semantics given in (18), however, the ungrammaticality follows from our earlier assumption that every sentence must have an A-component. The problem with the second sentence in (21) is that it has a B-component, but lacks a well formed A-component:

(22) a. $*\langle \lambda x[\text{John invited } x], ???, \{\text{Bill, Sarah, Tom, ...}\} \rangle$
 b. $\exists y, y=\text{Bill}, \neg[\text{John invited } y]$

If we are correct in assuming that X is the focus that maps onto the A-component, the template for constructing the B-component is $\exists y, y \in \text{ALTERNATIVES} \ \& \ y=Y, \lambda x \neg \Phi(y)$.⁵

It is widely assumed that focus-sensitive particles like *even*, *also* and *only* operate on the set of alternatives generated by focus, in a manner similar to what we have proposed for contrastive focus and *not Y but X*. For example, *even* requires that the alternatives are ordered on some scale determined by the context. It implies (i) that the focus is the least likely alternative for which the proposition derived by function application is true; and (ii) that there is at least one alternative for which the proposition derived by function application is more likely to be true and is in fact true. In other words, the template for constructing the B-component triggered by *even* is: $\exists y, y \in \text{ALTERNATIVES}, [\lambda x \Phi(\text{FOCUS}) \prec_{\text{likely}} \lambda x \Phi(y)] \ \& \ \lambda x \Phi(y)$.

As an example, consider how the semantics of (23) is generated. First, the A-component is constructed. This is a simple process, as the A-component is equivalent to the semantics of the sentence without *even* (see (23a)). Second, the B-component is put together, using the template just introduced. This yields (23b).

(23) John invited even PIA.
 a. $\langle \lambda x[\text{John invited } x], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$
 b. $\exists y, y \in \{\text{Bill, Sarah, Tom, ...}\}, [[\text{John invited Pia}] \prec_{\text{likely}} [\text{John invited } y]]$
 $\ \& \ [\text{John invited } y]$

Notice that the B-component of *even* is non-polar in the sense that the polarity of the sentence that contains *even* is the same as that of the B-component.

The semantic contribution of *also* is very similar to that of *even*, except that it does not introduce a scale:

⁵ One may wonder whether *not Y but X* is an instance of meta-linguistic negation in the sense of Horn (1989). An example of meta-linguistic negation would be *He invited not BARACK but THE PRESIDENT OF THE UNITED STATES* (where the use of the first name is deemed inappropriate). There are reasons to reject such an analysis. First, there is no sense in the examples we discuss of commenting on or correcting aspects of the use of language. Second, Horn introduces a test to identify meta-linguistic negation: but must be omitted when the order of the two relevant constituents is reversed (see (i)). This not true of the examples we use in the main text (see (ii)).

(i) He invited *THE PRESIDENT OF THE UNITED STATES*, (*but) not BARACK.
 (ii) He invited *PIA*, (but) not BILL.

- (24) John also invited Pia.
 a. $\langle \lambda x[\text{John invited } x], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$
 b. $\exists y, y \in \{\text{Bill, Sarah, Tom, ...}\}, [\text{John invited } y]$

Unlike *even* and *also*, *only* triggers a polar B-component. Thus, in a positive context, *only* contributes the negative meaning that there is no alternative to the focus such that the proposition derived by applying the background function to it is true. In other words, the template for the B-component contributed by *only* is $\neg \exists y, y \in \text{ALTERNATIVES}, \lambda x \Phi(y)$. This is illustrated by the example in (25).⁶

- (25) John invited only Pia.
 a. $\langle \lambda x[\text{John invited } x], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$
 b. $\neg \exists y, y \in \{\text{Bill, Sarah, Tom, ...}\}, [\text{John invited } y]$

In sum, contrastive focus, *not Y but X* and *only* contribute a polar B-component to the interpretation of the sentence that contains them, while *even* and *also* do not.

It is well-known that the various focus particles differ with respect to the status of the A- and B-components in terms of whether they are asserted or not (Horn 1969, Karttunen & Peters 1979, Rooth 1985, König 1991). This difference will become important later when we discuss why structures ruled out by (3) are sometimes grammatical on a different reading. The test we will use to determine whether a given component is asserted or presupposed is based on coordination. A sentence S1 that expresses a proposition p can precede, but not follow a sentence S2 that presupposes p (see Horn 1969, Horn 1972, Beaver & Clark 2008 Ch.9):

- (26) a. S1 and S2
 b. #S2 and S1

In relation to the focus particles under discussion, if we find the above pattern, we take S2 to presuppose S1; if we do not find this pattern, we take S1 to also be asserted.⁷ For *even*, this test suggests that the A-component is asserted and the B-component is presupposed. In the context in (27), a scale is established for the two salient individuals that makes Sue more likely to be invited by John than Mary. The ordering restriction observed in (27) follows if the B-component of *John invited even Mary* is presupposed.

- (27) [Context: In John's village there are two individuals, Bill and Pia, that he might consider inviting for dinner. However, he doesn't really like Bill and he dislikes Pia even more.]
 a. John invited Bill and he invited even Pia.
 b. #John invited even Pia and he invited Bill.

⁶ We restrict our discussion to exclusive *only*. There is also a scalar *only*, whose interpretation also is affected by a c-commanding negation. It would take us too far afield to discuss why this might be the case (but see Hole 2011 for a recent account).

⁷ What we have labelled here as 'presupposition' might be a heterogeneous class. It is, for example, well-known that the A-component of *only* does not behave like other presuppositions such as the complement of factive predicates in that it is suspendable with modalised denials, but it is not an assertion either (see Horn 2002, Beaver & Clark 2008 and references therein). The exact status of the components labelled as 'presuppositions' is less important for our argumentation than the fact there is an asymmetry between such components and assertions.

The same pattern obtains for *also*, suggesting that with this focus-sensitive particle, too, the B-component is presupposed.

- (28) [Context: In John's village there are two individuals, Bill and Pia, that he might consider inviting for dinner.]
 a. John invited Bill and he also invited PIA.
 b. #John also invited PIA and he invited Bill.

In the case of *only*, what is asserted is generally taken to be the polar B-component, rather than the A-component, while the latter is usually considered to be presupposed (Horn 1969, König 1991, Rooth 1985, Krifka 1993). This is confirmed by the coordination test. The content of the A-component of *John invited only Mary* is that John invited Mary. As (29) shows, a sentence stating the latter can precede the former, but not vice versa.

- (29) a. John invited Pia and he invited only PIA.
 b. #John invited only PIA and he invited Pia.

One may wonder why, in contrast to what we have observed with *even* and *also*, it is the A-component of *only* rather than the B-component that is presupposed. We take the pattern found with *even* and *also* to be the unmarked alignment of meaning components with assertion and presupposition. The fact that the alignment is reversed in the case of *only* falls out naturally from the general absence in natural language of presuppositions of non-existence. Sentences often carry the presupposition that some entity exists, but never that some entity does not exist.⁸ Consider in this light the formula in (25b). Since it is a negative statement, it cannot be construed as a presupposition, triggering a marked pattern of alignment of A- and B-components with assertion and presupposition.

- (30) A sentence may not carry the presupposition that an entity does not exist.

Next, consider the behaviour of *not Y but X* in the coordination test:

- (31) a. #John invited Pia and he invited not BILL but PIA.
 b. #John invited not BILL but PIA and he invited Pia.
 c. #John didn't invite Bill and he invited not BILL but PIA.
 d. #John invited not BILL but PIA and he didn't invite Bill.

The observations in (31) show that neither the A-component nor the B-component contributed by *not Y but X* is presupposed. We therefore conclude that both are asserted. At present, we are not sure why this should be so.

To complete the picture, we suggest that in the case of contrastive focus the A-component is asserted, while the B-component is presupposed. The above test is not easily applicable to contrastive foci, as it is difficult to embed the relevant kind of coordinate structure in the context of correction. However, notice that in contexts of correction it is awkward to omit the explicit expression of negation (that is, *No, you are wrong*, or at least *No*, in the reply in (15)). Such an expression asserts that the preceding statement is false. The fact that its presence is

⁸ More precisely, what (30) excludes are presuppositions of the form $\neg\exists x.\Phi$; a presupposition of the form $\exists x.\Phi$, where Φ contains a negative operator, is permitted. Thus, an example like *John regretted that Bill did not come* does not violate (30), as what is presupposed is the truth of the complement clause. There is no separate presupposition that there does not exist a person who came. Similarly, an example like *John almost won* presupposes that 'John did not win', but not that 'there is no person who won'.

obligatory suggests that the sentence *Pia he invited* only presupposes and not asserts the falsity of the initial statement *John invited Bill*.

The following table summarises the findings of this section:

(32)		contrastive focus	<i>only</i>	<i>even</i>	<i>also</i>	<i>not Y but X</i>
	Is the A-component asserted?	yes	no	yes	yes	yes
	Is the B-component asserted?	no	yes	no	no	yes
	Is the B-component polar?	yes	yes	no	no	yes

In view of these facts, the general prediction of (3) is that sentential negation cannot take scope over a contrastive focus, a DP to which *only* is attached and DPs of the form *not Y but X*, but DPs modified by *even* and *also* can. Since (3) holds at LF, however, we need to first consider covert movement possibilities of these various constituents to determine the precise empirical predictions. We take up this issue in the next section.

3. Covert Movement

If DPs accompanied by focus-sensitive particles could freely raise at LF, any violation of (3) could be repaired. This condition would consequently be toothless in that it would make no predictions regarding which elements may follow sentential negation at the surface. There is little doubt that such DPs can indeed raise at LF, as noted by Taglicht (1984). However, there are some restrictions on this kind of covert movement. In particular, DPs accompanied by focus particles cannot raise across other DPs accompanied by focus-sensitive particles (see Neeleman & van de Koot 2011, *pace* Wagner 2009). This appears to be part of a more general pattern. We will show in this section that the DPs under discussion cannot raise across sentential negation either. If correct, (3) will after all make testable predictions.

The following example, adapted from Taglicht (1984:150), illustrates that a DP accompanied by *only* can undergo covert movement. The sentence is ambiguous. If the DP remains in situ, *only* takes scope over the embedded clause, which implies that the speaker knew that John had not learnt any other language than Spanish. If *only Spanish* is raised into the matrix clause, the reading that obtains is that Spanish is the only language such that the speaker knew that John had learnt it.⁹

- (33) I knew John had learnt only *SPANISH*. (ambiguous)
 narrow: I knew that Spanish was the only language John had learnt.
 wide: Spanish is the only language which I knew John had learnt.

The ambiguity observed in (33) disappears when we introduce sentential negation in the matrix clause. (Note that (3) is applicable only if negation is present in the same clause as the focused element; negation in the matrix clause does not affect licensing in the embedded clause of items contributing a polar component.) In other words, the example in (34) does not have the reading that Spanish is the only language that the speaker did not know that John had learnt.

⁹ We are aware that some speakers find it difficult to get the wide scope reading of *only* in examples like (33). Moreover, raising of this type seems to be absent in some other languages, such as Dutch and German. We have no explanation for this speaker variation or the cross-linguistic difference. However, crucially for this paper, speakers that do accept raising of *only* in a positive sentence disallow it in the negative counterpart (see (34) below).

- (34) I didn't know John had learnt only *SPANISH*. (unambiguous)
 narrow: I didn't know that Spanish was the only language John had learnt.
 wide: *Spanish is the only language such that I didn't know John had learnt it.

That the wide scope reading is absent is shown by the infelicity of the following utterance in the given context – it is the only reading that would make sense in that context.

- (35) [Context: John has learnt Spanish, French, Italian and Portuguese. B knew that John had learnt French, Italian and Portuguese, but didn't know that he had learnt Spanish. Now A and B are told that John has learnt all four languages.]
 A: Did you know that John spoke all these languages?
 B: #I didn't know that John had learnt only *SPANISH*.

The above pattern with *only* extends to *even* and *also*. Raising is possible, but not across sentential negation. We illustrate this in (36)-(39).

- (36) I knew John had learnt even *SPANISH*. (ambiguous)
 narrow: I knew that even Spanish was such that John had learnt it.
 wide: Even Spanish is such that I knew John had learnt it.
- (37) I didn't know John had learnt even *SPANISH*. (unambiguous)
 narrow: I didn't know that even Spanish was such that John had learnt it.
 wide: *Even Spanish is such that I didn't know John had learnt it.
- (38) I knew John had also learnt *SPANISH*. (ambiguous)
 narrow: I knew that Spanish is also a language that John had learnt.
 wide: (*)Spanish is also a language which I knew John had learnt.¹⁰
- (39) I didn't know John had also learnt *SPANISH*. (unambiguous)
 narrow: I didn't know that Spanish is also a language that John had learnt.
 wide: *Spanish is also a language which I did not know John had learnt.

The absence of the wide scope readings of *even* and *also* that would require raising across negation is confirmed by the following.

- (40) [Context: A and B vaguely know John, but they don't know that he is a student in the Spanish Department who has taken a number of other language courses, including Inuktitut. John's girlfriend has just told A and B all about John, including the fact that he can speak Inuktitut.]
 A: Did you know that John had learnt Inuktitut?
 B: How could I? I don't know him all that well. #I didn't know that John had learnt even *SPANISH*.

¹⁰ We are unsure of the availability of the wide scope reading here, as it is difficult to distinguish it from the narrow scope reading. The following example, adapted from Taglicht (1984:15) suggests that raising of *also* is not possible:

(i) They were advised to also learn Spanish.
 narrow: The content of the advice they received was to learn Spanish in addition to another language.
 wide: *They received advice to learn one language and they received separate advice to learn Spanish.

The crucial point for the argumentation of this paper, however, is that *also* cannot raise across negation, as illustrated by (39).

(41) [Context: John has learnt Spanish and Italian. A knows this, but B doesn't. B has just been told that John has learnt Spanish.]

A: Did you know that John had learnt Italian?

B: No. #And I didn't know John had also learnt *SPANISH*.

In contrast to DPs accompanied by focus-sensitive particles, contrastive focus can raise across negation without any problems. The ambiguity observed in the positive sentence in (42) is retained in the negative sentence in (43). (See Reinhart 1993 for discussion of the idea that non-quantificational DPs can raise at LF.)

(42) I knew John had learnt *SPANISH*. (ambiguous)

narrow: I knew that Spanish, as opposed to e.g. Italian, is such that John had learnt it.

wide: Spanish, as opposed to e.g. Italian, is such that I knew John had learnt it.

(43) I didn't know John had learnt *SPANISH*. (ambiguous)

narrow: I didn't know that Spanish, as opposed to e.g. Italian, is such that John had learnt it.

wide: Spanish, as opposed to e.g. Italian, is such that I didn't know John had learnt it.

That the wide scope reading of the contrastive focus *Spanish* is indeed available can be demonstrated by using the context in (44).

(44) [Context: B is John's tutor and is supposed to know exactly which languages John has learnt. John could learn two languages: Spanish and Italian. He told his tutor that he would learn Italian and not Spanish. However, in fact, he took both languages.]

A: Did you know that John had learnt both Italian and Spanish?

B: I didn't know that John had learnt *SPANISH*.

B's answer only makes sense if *Spanish* is construed as having wide scope, as what is at issue is the tutor's knowledge about Spanish as opposed to Italian. If *Spanish* were to be construed as having narrow scope, B's answer would imply that what B did not know was that John had learnt Spanish, but not Italian. This is incompatible with the context in (44), in which the tutor is aware of John's having learnt Italian.

Finally, we consider the scope taking properties of *not Y but X*. The following example shows that constituents of this shape cannot take wide scope at all, suggesting that they cannot undergo raising at LF.

(45) I knew John had learnt not ITALIAN but *SPANISH*. (unambiguous)

narrow: I knew that Spanish as opposed to Italian is such that John had learnt it.

wide: *Spanish as opposed to Italian is such that I knew John had learnt it.

The unavailability of LF-raising even in a positive context can be illustrated using the context in (46).

(46) [Context: B knows that John has learnt Spanish, but has just been informed that John has learnt Italian as well.]

A: Did you know that John had learnt both Italian and Spanish?

B: #I knew John had learnt not ITALIAN but *SPANISH*.

Considering that a wide scope reading of *not Y but X* is unavailable even in a positive context, it stands to reason that raising across negation is ruled out as well. Notice that overt fronting of *not Y but X* allows for a wide scope reading. Thus, (47) would be a little awkward, but nonetheless an appropriate answer in the context of (46).

(47) B': Not ITALIAN but SPANISH I knew John had learnt.

Clearly, the above data require further investigation, as it is not immediately obvious why certain types of foci differ from others in their ability to undergo LF raising. However, it would take us too far afield to provide an account in this paper. What is relevant in the present context is the mere fact that some foci can raise across negation at LF and some others cannot. This allows us to be more precise about the predictions that follow from (3), which are summarised in (48). Since contrastive focus can covertly raise across negation, it can escape the effect of (3) and we therefore expect to find a contrastive focus in the c-command domain of negation at the surface. The same is not true of *only* and *not Y but X*. They should not surface in the c-command domain of negation, as they are subject to (3) and cannot escape its effect through LF-raising. *Even* and *also* do not contribute a polar B-component and thus their distribution is not restricted by (3).

(48)

	contrastive focus	<i>only</i>	<i>even</i>	<i>also</i>	<i>not Y but X</i>
... \neg ... X ...	✓	✗	✓	✓	✗

We will evaluate these predictions in the next section.

4. Focus under Negation

We begin by stating the default rule for interpreting negation:

(49) By default, sentential negation is mapped onto the A-component, while constituent negation is mapped onto the B-component.

We also need to make explicit where in the A- and B-components negation is interpreted. We propose the following:

- (50) a. Negation in the A-component is prefixed to the proposition inside the λ -function.
b. Negation in the B-component takes scope over the existential quantifier. The one exception is the *not Y but X* construction, where it is prefixed to the nuclear scope of the existential quantifier.¹¹

We first consider the focus particles *even* and *also*. Given the non-polar nature of the B-component induced by *even*, we expect that *even* can appear in the c-command domain of sentential negation without any difficulties. Thus, in an example like (51), the correct interpretation follows simply from prefixing a negative operator to the proposition inside the function given in the A-component. Given that this function is used to construct the nuclear scope of the existential operator in the B-component (in accordance with the template discussed just above (23)), the negation will also appear in several places there:¹²

¹¹ At present, we do not fully understand why *not Y but X* behaves differently. This may be due to the fact that unlike other focus sensitive particles, *not Y but X* does not have an operator-argument configuration.

¹² Given that the A-component represents the sentence meaning minus the focus-sensitive particle and that the B-component of *even* is built according the template in (i), the derivation of the B-component in (51) is as

- (51) John didn't invite even Pia.
 a. $\langle \lambda x \neg[\text{John invited } x], \text{Pia}, \{\text{Bill Sarah, Tom, ...}\} \rangle$ (asserted)
 b. $\exists y, y \in \{\text{Bill, Sarah, Tom, ...}\},$
 $\neg[\text{John invited Pia}] <_{\text{likely}} \neg[\text{John invited } y] \text{ \& } \neg[\text{John invited } y]$ (presupposed)

As a consequence, the sentence asserts that John did not invite Pia and presupposes that at least one other person more likely not to be invited than Pia was also not invited. The ordinary value is generated by applying the focus *Pia* to the function $\langle \lambda x \neg[\text{John invited } x]$, yielding $\neg[\text{John invited Pia}]$. The focus value is obtained by applying the focus and the members of the set of alternatives to the λ -function. In the B-component, it is stated that an alternative proposition more likely to be true than $\neg[\text{John invited Pia}]$ is also true (that is, someone more likely not to be invited than Pia was actually not invited).

The pattern extends straightforwardly to the additive particle *also*, with the proviso that in a negative context *either* must be used, the negative polarity counterpart of *also*. The example in (52) has a non-polar B-component stating that there is an alternative to Pia and that this person was invited in addition to Pia.

- (52) John also invited Pia.
 a. $\langle \lambda x [\text{John invited } x], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$ (asserted)
 b. $\exists y, y \in \{\text{Bill, Sarah, Tom, ...}\}, [\text{John invited } y]$ (presupposed)

Adding negation to the sentence simply results in the assertion that John did not invite Pia and the negative presupposition that the same is true for an alternative to Pia.

- (53) John didn't invite Pia either.
 a. $\langle \lambda x \neg[\text{John invited } x], \text{Pia}, \{\text{Bill Sarah, Tom, ...}\} \rangle$ (asserted)
 b. $\exists y, y \in \{\text{Bill, Sarah, Tom, ...}\}, \neg[\text{John invited } y]$ (presupposed)

A crucial prediction of (3) is that it should be impossible to place *only* in the c-command domain of negation and for it to contribute its usual polar B-component. We therefore expect an example like (54) to be ungrammatical on the relevant reading, which is that Pia was not invited, but all alternatives to Pia were, as stated in (54a) and (54b), respectively. Indeed, the example does not permit this reading.

- (54) !!John didn't invite only Pia.
 a. $\langle \lambda x \neg[\text{John invited } x], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$ (presupposed)
 b. $\neg \exists y, y \in \{\text{Bill, Sarah, Tom, ...}\}, \neg[\text{John invited } y]$ (asserted)

The sentence in (54) is of course grammatical on a different reading, which parallels the interpretation of *John invited not only Pia*. On this reading, *not* cancels the negative operator

given in (ii). As the function in the A-component contains a negative operator, this operator is copied into the nuclear scope of the existential quantifier of the B-component.

- (i) $\exists y, y \in \text{ALTERNATIVES}, [\lambda x \Phi(\text{FOCUS}) <_{\text{likely}} \lambda x \Phi(y)] \text{ \& } \lambda x \Phi(y)$
 (ii) b. $\exists y, y \in \{\text{Bill, Sarah, Tom, ...}\},$
 $[\lambda x \neg[\text{John invited } x] (\text{Pia}) <_{\text{likely}} \lambda x \neg[\text{John invited } x](y)] \text{ \& } \lambda x \neg[\text{John invited } x](y)$
 b'. $\exists y, y \in \{\text{Bill, Sarah, Tom, ...}\},$
 $\neg[\text{John invited Pia}] <_{\text{likely}} \neg[\text{John invited } y] \text{ \& } \neg[\text{John invited } y]$

present in the B-component of *only*. The resulting interpretation is comparable to that of *also*. For example, (55) presupposes that Pia is invited and asserts that there is at least one alternative to Pia who is invited as well.

- (55) John didn't invite *only* Pia.
 a. $\langle \lambda x[\text{John invited } x], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$ (presupposed)
 b. $\neg \exists y, y \in \{\text{Bill, Sarah, Tom, ...}\}, [\text{John invited } y]$ (asserted)

We propose that the availability of the surprising reading in (55) is a consequence of the unavailability of the reading in (54). As stated in (50), sentential negation makes a default contribution to the A-component. When this interpretation is blocked by an independent constraint such as (3), sentential negation may be used to negate the assertion (the B-component triggered by *only*). We will call this phenomenon ‘negative migration’ and assume that it is restricted by the rule in (56).

- (56) If the default interpretation of negation is unavailable, it may migrate, but only from a presupposition to an assertion.

A migrated negation follows the rules in (50) with respect to its placement within the component it migrates to.

In many cases the non-default interpretation of sentential negation will be unavailable because the A-component is the assertion. However, *only* differs from other particles in that the B-component is asserted, allowing migration of sentential negation. Thus, in (55), negation migrates from the A-component to the B-component, cancelling the negative operator contributed by *only*. Note that the interpretation of (55) as licensed by (56) does not violate the generalisation in (3). Although *only* is in the c-command domain of negation, negative migration has the consequence that the B-component is no longer polar. The A-component is positive, and the B-component is positive as well given that two adjacent negative operators cancel each other out.¹³

Importantly, (3) is stated in terms of c-command at LF. We therefore expect that *only* gives rise to its usual polar B-component if it appears in a negative sentence but outside the c-command domain of the negation. A first case to look at is where *only* modifies a subject, as in (57). Here, the sentence has the predicted A- and B-components, namely that Pia did not arrive, and that there is no alternative to Pia who did not arrive (i.e., all alternatives to Pia did arrive). Moreover, negative migration is not possible, as negation can receive its default interpretation as part of the A-component. The sentence therefore cannot mean that Pia also arrived (on a par with (55)).

- (57) Only Pia didn't arrive.
 a. $\langle \lambda x \neg [x \text{ arrived}], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$ (presupposed)
 b. $\neg \exists y, y \in \{\text{Bill, Sarah, Tom, ...}\}, \neg [y \text{ arrived}]$ (asserted)

Another example in which *only* appears outside the c-command domain of sentential negation is given in (58), where a fronted object is modified by *only*. This example has the reading that

¹³ Notice that in *John didn't invite only Pia* the negation has the syntax of sentential negation (e.g. it triggers do support and licenses a positive tag). However, it is not interpreted as such. The truth conditions of semantic sentential negation are that a situation must hold that is part of the complement set of the situations in which the positive sentence is true. Thus, if we were dealing with semantic sentential negation, we would expect that *John didn't invite only Pia* would be true in the same situations as *It is not the case that John invited only Pia*. This is simply not the case: the latter but not the former sentence can be true if John did not invite Pia.

was unavailable in (54), namely that everyone except Pia was invited. Because negative migration is ruled out here, it lacks the reading in (55) has, namely that John also invited Pia.¹⁴

(58) Only Pia did John not invite.

- a. $\langle \lambda x \neg [\text{John invited } x], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$ (presupposed)
- b. $\neg \exists y, y \in \{\text{Bill, Sarah, Tom, ...}\}, \neg [\text{John invited } y]$ (asserted)

The contrast between (54) and (57) might lead one to think that we are dealing with a subject-object asymmetry, but the fact that (58) patterns with (57) in the kind of B-component it has demonstrates that this cannot be true. The crucial factor appears to be c-command by sentential negation. This conclusion is further confirmed by data from Dutch. Dutch differs from English in that negation is located close to the verb, following all DP arguments. Consequently, an object is not c-commanded by sentential negation at the surface. It is correctly predicted that the reading expressed by (58) in English is available in Dutch even if the object is not fronted:

(59) Jan heeft alleen Pia niet uitgenodigd.

Jan has only Pia not invited

‘Only Pia Jan didn’t invite.’

- a. $\langle \lambda x \neg [\text{Jan invited } x], \text{Pia}, \{\text{Willem, Sara, Tom, ...}\} \rangle$ (presupposed)
- b. $\neg \exists y, y \in \{\text{Bill, Sarah, Tom, ...}\}, \neg [\text{Jan invited } y]$ (asserted)

Furthermore, PP arguments in Dutch typically follow sentential negation and hence appear in its c-command domain. In cases where *only* modifies the DP complement of a preposition, the reading that is triggered corresponds to the English *not only*:¹⁵

(60) !!Jan heeft het boek niet aan alleen Pia gegeven.

Jan has the book not to only Pia given

‘Jan hasn’t given the book only to Pia.’

- a. $\langle \lambda x \neg [\text{Jan has given the book to } x], \text{Pia}, \{\text{Willem, Sara, Tom, ...}\} \rangle$ (presupposed)
- b. $\neg \exists y, y \in \{\text{Willem, Sara, Tom, ...}\}, \neg [\text{Jan has given the book to } y]$ (asserted)

(61) Jan heeft het boek niet aan alleen Pia gegeven.

Jan have the book not to only Pia given

‘Jan hasn’t given the book only to Pia.’

- a. $\langle \lambda x [\text{Jan has given the book to } x], \text{Pia}, \{\text{Willem, Sara, Tom, ...}\} \rangle$ (presupposed)
- b. $\neg \exists y, y \in \{\text{Willem, Sara, Tom, ...}\}, [\text{Jan has given the book to } y]$ (asserted)

There is reason to think that the pattern just observed extends beyond Dutch. In Hungarian (Anikó Lipták, p.c.), where objects of the form ‘only X’ appear higher than negation, the non-migrated reading obtains.

The data in (57)-(61) are important not just because they are predicted by the combination of (3), (49), (50) and (56), but also because some of them falsify a potentially simpler

¹⁴ It appears that most speakers prefer subject-aux inversion when *only*-XP is fronted, although some speakers also permit such fronting without inversion: *Only Pia John didn’t invite*. This does not affect our argumentation.

¹⁵ Many speakers of Dutch prefer the focus-sensitive particle *alleen* to precede the preposition. This does not change the reading. We use an example with the dispreferred order, however, in order to guarantee that the negation *niet* is not attached directly to the focus-sensitive particle.

alternative account of the data discussed earlier in this section. This alternative would be based on the assumption that sentential negation always applies to the asserted component, which straightforwardly captures the data in (51), (53), (54) and (55) (and (60) and (61)). However, the claim that negation always applies to the assertion cannot be correct, because it does not capture the contrast between cases where *only* appears in the c-command domain of negation and cases where it does not. When *only* is outside the c-command domain of negation, as in (57), (58) and (59), negation applies to the presupposition, which is the A-component for *only*. This is as predicted by (49), (50) and (56).

Before we consider the behaviour of the remaining types of foci, we should point out another instance of negative migration. We just saw for *only* that sentence negation can migrate into the B-component, giving rise to a reading akin to constituent negation. With *even*, the exact opposite pattern is observed: constituent negation is interpreted as if it were sentence negation. The following example has the same interpretation as *even Pia didn't arrive* (Horn 1989: Ch.2).

(62) Not even Pia arrived.

- a. $\langle \lambda x \neg [x \text{ arrived}], \text{Pia}, \{\text{Bill Sarah, Tom, ...}\} \rangle$ (asserted)
- b. $\exists y, y \in \{\text{Bill, Sarah, Tom, ...}\},$
 $[\neg [\text{Pia arrived}] \text{ <likely } \neg [y \text{ arrived}]] \ \& \ \neg [y \text{ arrived}]$ (presupposed)

However, the interpretation one would actually expect for (62) is the one in (63).

(63) !!Not even Pia arrived.

- a. $\langle \lambda x [x \text{ arrived}], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$ (asserted)
- b. $\neg \exists y, y \in \{\text{Bill, Sarah, Tom, ...}\},$
 $[[\text{Pia arrived}] \text{ <likely } [y \text{ arrived}]] \ \& \ [y \text{ arrived}]$ (presupposed)

The interpretation in (63) is disallowed by (30), the requirement that a sentence not carry the presupposition that an entity does not exist: the B-component in (63) expresses such a presupposition, namely that no relevant alternative to Pia exists. This implies that negative migration is necessary for the sentence to be grammatical. Since the A-component is asserted, the rule in (56) allows *not* to be interpreted as sentential negation. Thus, the opposite direction of negative migration observed with *even* and *only* is a direct consequence of the fact that assertion and presupposition are aligned differently with the A- and B-components contributed by these particles. These different alignments can themselves be explained, at least partially, by the ban on presuppositions of non-existence.¹⁶

We now turn to contrastive focus. Recall that contrastive focus as opposed to other types of foci can undergo LF-raising across negation. This means that contrastive focus should be able to surface in the c-command domain of negation without violating (3), because it can escape from the domain to which (3) applies. We show below that this prediction is correct.

It has been observed that a sentence like (64) is ambiguous (Jackendoff 1972, Jacobs 1991, Herburger 2000). The two readings are as given.

¹⁶ There is a complication with *not even* that cannot be explained in terms of the principles we have seen so far. One might expect from the preceding discussion that **I invited not even Pia* should be grammatical, contrary to fact. What this shows is that there must be further restrictions on negative migration so that the example is ruled out as a violation of the ban on negative presuppositions on a par with (63). At present, we do not know what the nature of this restriction might be, but the attested patterns of negative migration suggest a general direction from subject constituent negation to sentence negation and from sentence negation to object constituent negation.

- (64) John didn't invite *PIA*.
 a. It is not the case that John invited Pia.
 b. John invited someone, but it was not Pia.

The reading in (64a) obtains if *Pia* is a regular, non-contrastive focus. Such a focus can appear in the c-command domain of negation at LF, as it does not contribute a polar B-component (see section 2). On our proposal, the reading in (64a) is represented as below.

- (65) LF: John didn't invite *PIA*.
 $\langle \lambda x \neg [\text{John invite } x], \text{Pia}, \{\text{Bill Sarah, Tom, ...}\} \rangle$ (asserted)

The reading in (64b) is generated if *Pia* is interpreted as a contrastive focus. In this case, LF-raising must take place in order to circumvent the effects of (3). The resulting interpretation is a combination of the negative operator taking scope over the lambda function in the A-component and the usual effect of a contrastive focus, namely a polar B-component. In the case at hand, this polar B-component states that there is an alternative to Pia such that John invited this person.

- (66) LF: *PIA*_i John didn't invite *t_i*.
 a. $\langle \lambda x \neg [\text{John invite } x], \text{Pia}, \{\text{Bill Sarah, Tom, ...}\} \rangle$ (asserted)
 b. $\exists y [y \in \{\text{Bill Sarah, Tom, ...}\} \ \& \ \neg \neg [\text{John invited } y]]$. (presupposed)

Notice that, unlike what we have seen for *only*, a negative sentence with a contrastive focus does not allow negative migration. We might expect negative migration to be possible if the contrastive focus remains in situ at LF so that the negation is construed as constituent negation. The effects of (3) could be side-stepped in this way on a par with what happens with *only* in (55). However, negative migration in this case would violate the rule in (54), which disallows negative migration unless it is from a presupposition to an assertion. It also violates the ban on presuppositions of non-existence in (30). The sentence (64) can therefore not mean that John invited Pia and everyone else.¹⁷

- (67) LF: !!John didn't invite *PIA*.
 a. $\langle \lambda x [\text{John invite } x], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$ (asserted)
 b. $\neg \exists y, y \in \{\text{Bill, Sarah, Tom, ...}\}, \neg [\text{John invited } y]$. (presupposed)

Finally, we consider the behaviour of *not Y but X*. As we saw in the previous section, *not Y but X* cannot undergo LF-raising. Thus, the prediction is that it should be impossible for *not Y but X* to surface in the c-command domain of negation. Not being able to raise, it would necessarily violate (3). The prediction is correct: the example in (68) is simply ungrammatical.

- (68) *John didn't invite not Bill but *PIA*.

¹⁷ Herburger (2000) claims B's first utterance in (i), which is like (64), has a reading distinct from the kinds of readings in (64a,b) as well as (67). Herburger suggests that this reading is brought out in the context given.

- (i) A: Yesterday, Sascha visited MONTMARTRE.
 B: No, Sascha didn't visit MONTMARTRE, because he in fact didn't visit ANYTHING! HE FELT SICK AND STAYED IN THE HOTEL ALL DAY.

We are not sure whether this is indeed a third kind of reading for an example with focus on the object. B's continuation suggests that it may well involve focus projecting to the VP.

The example cannot be rescued by applying negative migration, as both the A- and B-components contributed by *not Y but X* are asserted. By (56), negative migration must be from a presupposition to an assertion. Hence, (68) cannot be saved by assigning it the interpretation in (69a,b).

- (69) *John didn't invite not Bill but *PIA*.
 a. $\langle \lambda x[\text{John invited } x], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$ (asserted)
 b. $\neg \exists y, y=\text{Bill}, \neg[\text{John invited } y]$ (asserted)

If (68) is indeed ruled out by (3), we predict that *not Y but X* can be part of a negative sentence so long as it c-commands the negation. One relevant case is where the subject has this form:

- (70) Not Joanna but *JOHN* didn't invite Pia.
 a. $\langle \lambda x \neg[x \text{ invited Pia}], \text{John}, \{\text{Joanna, Gerald, Jennifer, ...}\} \rangle$ (asserted)
 b. $\exists y, y=\text{Joanna}, \neg \neg[y \text{ invited Pia}]$ (asserted)

Similarly, overtly moving the object in (68) results in a grammatical example that has the predicted interpretation:

- (71) [Not Bill but *PIA*]_i, John didn't invite _i.
 a. $\langle \lambda x \neg[\text{John invited } x], \text{Pia}, \{\text{Bill, Sarah, Tom, ...}\} \rangle$ (asserted)
 b. $\exists y, y=\text{Bill}, \neg \neg[\text{John invited } y]$ (asserted)

We can further demonstrate the effects of (3) using Dutch. Recall that in this language negation tends to follow DP arguments, but precedes PPs. As opposed to English, an object of the form *not Y but X* can remain in situ in a negative sentence, because it is not in the c-command domain of the negation. On the other hand, a PP containing a complement of the form *not Y but X* in a negative sentence is c-commanded by the negation and therefore violates (3).

- (72) Jan heeft niet Willem maar Pia niet uitgenodigd
Jan has not Willem but Pia not invited
 'Not Willem but Pia, Jan didn't invite.'
 a. $\langle \lambda x \neg[\text{Jan invited } x], \text{Pia}, \{\text{Willem, Sara, Tom, ...}\} \rangle$ (asserted)
 b. $\exists y, y=\text{Willem}, \neg \neg[\text{Jan invited } y]$ (asserted)

- (73) *Jan heeft het boek niet aan niet Willem maar Pia gegeven.
Jan has the book not to not Willem but Pia given
 Intended: 'It was not to Willem but to Pia that Jan didn't give the book.'

In this section, we have seen the empirical evidence for the condition in (3), which states that focus-related items contributing a polar B-component cannot appear in the c-command domain of sentential negation at LF. As a consequence, *even* and *also/either*, which contribute a non-polar B-component, can appear in such a position, but it is predicted that *only*, *not Y but X* and contrastive focus cannot do so. The prediction is straightforwardly borne out in the case of *not Y but X*. It is correct for *only* to the extent that the expected reading of *only* under negation is not available. The string *not ... only ...* is grammatical on a different interpretation resulting from negative migration. Finally, contrastive focus can

surface in a position following the negation, but this is the result of its ability to raise across negation at LF, escaping the effects of (3).

5. Concluding Remarks

Given the empirical evidence for the condition in (3), we might ask what its theoretical status is. One possibility is that contrastive focus, as well as foci accompanied by focus-sensitive particles must always raise at LF. The effects of (3) would then come about as a result of negation blocking this obligatory movement. However, an account of this type is unlikely to be correct. Firstly, we have seen that some items, in particular *not Y but X*, cannot undergo raising at LF at all. Secondly, focus-sensitive particles that contribute a non-polar B-component, namely *even* and *also/either*, can appear in the scope of negation, but cannot raise across it. Both observations suggest that there cannot be a general requirement that foci take wide-scope.

One feasible alternative approach is to characterise material triggering polar B-components as positive polarity items (PPIs). There is in fact some evidence that this might be on the right track. PPIs cannot be interpreted in the scope of negation. Thus, (74a) is grammatical only on the reading where the PPI *some* takes wide scope with respect to *not*. However, there are exceptions to its pattern. It has been noted that PPIs can appear in the scope of negation if shielded by a clause boundary or an intervening quantificational adverb like *always* (Ladusaw 1979; the following examples are adapted from Schwarz & Bhatt 2006:175-176).

- (74) a. They didn't find some typos.
 *not > some
 b. I didn't say that they found some typos.
 not > some
 c. They didn't always find some typos.
 not > always > some

The same pattern is found with *only*.¹⁸ The example in (75a) is ungrammatical unless negative migration takes place, as we already saw in (54) and (55). The absence of the non-migrated reading shows that *only* cannot be interpreted in the scope of local negation. Notice, however, that the non-migrated reading is the only one available in (75b), which means that it is possible for *only* to appear in the scope of sentential negation if there is an intervening clause-boundary (see also the examples in (34) and (35)). Similarly, (75c) does not have a reading where negation has migrated to the B-component contributed by *only*, illustrating the shielding effect of *always*. In other words, the distribution of non-migrated readings of sentences containing *only* mirrors the distribution of PPIs.

- (75) a. John didn't invite only PIA.
 *non-migrated reading (see (55)); migrated reading (see (54))

¹⁸ We limit our discussion here to *only*. The other relevant item to consider is *not Y but X*. However, there is variation in the judgements that bear on the question of whether *not Y but X* is a PPI or not. We must leave further investigation of this construction for future research. It is not clear what predictions are made with respect to contrastive focus, as that depends on the extent to which a contrastive focus can undergo LF-raising. We have seen in section 3 that a contrastive focus can raise more freely than other items, but we do not know at present whether there are any further restrictions.

- b. I didn't say that John invited only Pia.
 non-migrated reading: \neg [I said that John invited Pia and no one else]
 *migrated reading: [I said that John invited Pia and someone else]
- c. John didn't always invite only Pia.
 non-migrated reading: \neg always [John invited Pia and no one else]
 *migrated reading: always [John invited Pia and someone else]

A further similarity involves so-called 'rescuing', where a PPI in the scope of local negation is rescued if the local negation itself is in the scope of a higher negative operator. The point is illustrated by (76) for the PPI *some*:

- (76) There's no one here who didn't find some typos.
 no one > not > some

In a similar vein, rescuing allows a non-migrated reading of the relative clause containing *only*. Consider the following example.

- (77) There's no one here who didn't invite only Pia.

The non-migrated reading is given in (78). This reading is rather hard to comprehend due to the numerous negative expressions it contains. However, the formula of the shape $\text{no } x \neg \Phi$ is equivalent to $\text{all } x \Phi$. The formulae in (78) can thus be simplified as in (79), which says that all persons z are such that z invited Pia and no one else. The formula in (79), and hence (78), indeed represents the interpretation one obtains for (77). (Recall that the nuclear scope of the B-component is derived from the λ -function in the A-component. Thus, omitting the negative operator prefixed to the λ -function in the A-component has the consequence that the negation prefixed to the nuclear scope in the B-component is also omitted.)

- (78) No person z is such that:
 a. $\langle \lambda x \neg [z \text{ invited } x], \text{Pia}, \{\text{Bill}, \text{Sarah}, \text{Tom}, \dots\} \rangle$
 b. $\neg \exists y, y \in \{\text{Bill}, \text{Sarah}, \text{Tom}, \dots\}, \neg [z \text{ invited } y]$

- (79) All person z is such that:
 a. $\langle \lambda x [z \text{ invited } x], \text{Pia}, \{\text{Bill}, \text{Sarah}, \text{Tom}, \dots\} \rangle$
 b. $\neg \exists y, y \in \{\text{Bill}, \text{Sarah}, \text{Tom}, \dots\}, [z \text{ invited } y]$

For completeness, we should note that the reading in which the negation has migrated is not available for (77). This reading is given in (80) and can be paraphrased as 'no person is such that they invited Pia and someone else'.

- (80) No person z is such that:
 a. $\langle \lambda x [z \text{ invited } x], \text{Pia}, \{\text{Bill}, \text{Sarah}, \text{Tom}, \dots\} \rangle$
 b. $\neg \exists y, y \in \{\text{Bill}, \text{Sarah}, \text{Tom}, \dots\}, [z \text{ invited } y]$

Finally, notice that the pattern observed with sentential negation extends to other anti-licensing contexts for PPIs. In particular, PPIs are disallowed in the c-command domain of *rarely*, as (81a) shows. This is also true of *only*: the negation contained in *rarely* must migrate if *only* is contained in its scope, as indicated.

- (81) a. *John rarely found some typos.
 b. John rarely invited only Pia.
 *non-migrated reading: \neg often [John invited Pia and no one else]
 migrated reading: often [John invited Pia and someone else]

We can demonstrate this by considering a context that excludes the migrated reading. The prediction is that (81b) cannot be used in such a context. Indeed, the example is an inaccurate summary of the situation in (82).

- (82) John has invited a number of people many times for dinner parties. But he has invited Pia only twice, and on those two occasions he invited Pia and no one else.

On the strength of this evidence, we feel justified in classifying *only* as a PPI. However, there are some differences. First, PPIs like *some* are banned from appearing in the scope of all negative operators, while the non-migrated reading of *only* with its usual polar B-component seems to be disallowed in the scope of only a subset of such operators. In this respect, there is a contrast between the example in (83a), which does not allow a narrow-scope reading of *some*, and (83b), which does allow a non-migrated reading.

- (83) a. No one found some typos.
 *no one > some; some > no one
 b. No one invited only Pia.
 non-migrated reading: $\neg\exists x[x \text{ invited Pia and no one else}]$
 *migrated reading: $\exists x[x \text{ invited Pia and someone else}]$

Secondly, it is well-known that possibility modals typically take scope below negation (see Palmer 1997 and references therein). In the case of regular PPIs, this does not lead to a shielding effect of the type observed with *always* or a clause boundary, as in (74b) and (74c). However, there does seem to be a shielding effect for *only*.

- (84) a. John couldn't find some typos.
 not > \Diamond > some
 b. John couldn't invite only Pia.
 non-migrated reading: $\neg\Diamond[\text{John invited Pia and no one else}]$
 *migrated reading: $\Diamond[\text{John invited Pia and someone else}]$

It seems then that PPIs must form a heterogeneous class, much like negative polarity items.

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