

Intervention in focus pied-piping*

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1. Introduction

In this paper we propose a new argument in support of the view that focus association involves *covert focus movement with pied-piping*, as proposed by Drubig (1994) and more recently supported by Krifka (2006) and Wagner (2006), and against the more prominent approach which does not involve movement (Rooth 1985, 1992). The evidence will come from an interaction between the interpretation of pied-piped constituents with *focus intervention effects* (Beck 2006).

The two approaches to the syntax/semantics of focus make different predictions regarding where Roothian focus alternative computation will be used in the interpretation of the structure. In the *in-situ* interpretation approach (1a), focus alternative computation (indicated by a squiggly arrow) will be used over the full extent between the focused constituent and the focus operator *only*. In the covert movement approach (1b), focus alternative computation will only be used in a region *near* and *above* the focused constituent.

(1) Two approaches to interpreting focus:

- a. I *only* read a book from THIS_F library.

←~~~~~
focus alternative computation

- b. I ... *only* read [*covert pied-piping* a book from THIS_F library].

↑-----!←~~~~~
movement *focus alternative computation*

The theory of *focus intervention effects* (Beck 2006) predicts that if a focus operator occurs above an alternative-generating element, it will block its interpretation by higher operators. In this paper we will show that this logic applies to focus constructions, substantiating a prediction of Beck's (2006) theory, and then apply focus intervention as a diagnostic to the question of how focus association is interpreted (1).

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This paper is structured as follows. First, we give a brief background on the two theories of focus association and Beck’s (2006) theory of focus intervention effects. In Section 3 we show that focus intervention occurs inside overt pied-piping constituents in English *it*-clefts. In Section 4 we examine the pattern of intervention in sentences with VP-level focus operators and show that intervention occurs only *above* and *near* the F-marked constituent, corresponding to the size of the covertly pied-piped constituent. This pattern supports the view that focus association involves covert focus movement with pied-piping and is unpre-*dicted* by the *in-situ* interpretation approach.

2. Background: focus association and focus intervention effects

It is well known that focus-sensitive operators such as *only*, *even*, etc., are interpreted relative to a particular constituent that is focused. Two different approaches have been proposed for how the operator combines compositionally with the focused constituent and its alternatives: (a) *in-situ interpretation* via focus alternative computation and (b) *covert focus movement with pied-piping*. We will briefly describe these two approaches in turn.

2.1 *In-situ* interpretation with focus alternative computation

Rooth (1985, 1992) proposed that focused constituents are interpreted *in-situ* and their alternatives are interpreted through an alternative mode of semantic composition. This computation of *focus semantic values* allows for the interpretation of focus without a syntactically local relationship between the focus operator and its focused constituent.¹

In this paper we will use a squiggly arrow to denote *focus alternative computation* between a focused constituent (with *F*) and its interpreting focus operator (in italics). In a simple example as in (2), where *coffee* is focused, this approach predicts focus alternative computation to occur between this focused constituent and the *only* that it associates with:

- (2) John *only* drinks COFFEE_F.


Following Jackendoff (1972), Rooth (1992), and Selkirk (1996), we adopt the view that focused constituents bear an abstract *F* feature in the narrow syntax, which affects the semantic interpretation at LF and the phonetic realization at PF.²

This *in-situ interpretation* approach using focus alternative computation has the advantage of being in principle unbounded. Example (3) below shows that focus association between a focus operator and its associated focused constituent can be long-distance, and in particular is not restricted by syntactic notions of locality such as islandhood. Evidence such as this has made this approach the most widely adopted approach to focus association in recent work by both semanticists and syntacticians.

¹Following Rooth (1992), we use $[[\alpha]]^f$ to indicate the focus semantic value of a node α , and $[[\alpha]]^o$ for its ordinary semantic value. See Beaver and Clark (2008, pp. 81–84) for a modern description of how focus semantic values are computed. See also Hamblin (1973) where essentially this same parallel mode of semantic computation is proposed for the interpretation of *wh*-words.

²The phonetic realization of F-marking is orthogonal to the topic at hand. For our purposes it suffices to say that part of the F-marked constituent will be realized with additional intonational prominence.

- (3) **Long-distance focus association through a syntactic island (Rooth 1985):**
 They *only* investigated [the question of whether you know [the woman who chaired [the ZONING BOARD]_F]].
 ⇒ They did not investigate the question of whether you know the woman who chaired *any other chairable entity*.

2.2 Focus movement with pied-piping

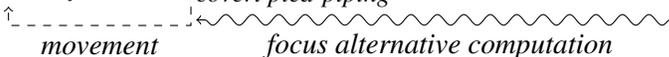
An alternative approach to establishing a relationship between a focus operator and its associate is to move the focused constituent to the operator, thereby producing a local relationship. In the case of focus association with F-marked constituents in their regular positions in the clause, this movement step would be covert. The challenge for the focus movement approach comes from focus association's disregard for syntactic locality and islandhood, as we saw in (3). Here we consider a simpler example (4), from Drubig (1994):

- (4) He *only* invited ex-convicts with RED_F shirts.

If the interpretation of *only* in (4) involves covert focus movement of the F-marked constituent, this movement would violate the Left Branch Constraint. Indeed, the corresponding *wh*-question in (5) is ungrammatical:

- (5) * [What color] did he invite ex-convicts with [___ shirts]?

Drubig (1994) proposes that in such cases, the covert focus movement *pied-pipes* material with the F-marked constituent, so that the movement does not violate syntactic constraints on movement. If \bar{A} -movement of the F-marked constituent by itself is not allowed (e.g. because it is in an island), a constituent properly containing the F-marked constituent which can be moved is moved instead. (6) below illustrates how example (4) would be interpreted under this approach.³ Focus alternative computation takes place inside the pied-piped constituent, between the F-marking and the edge of the pied-piping (Horvath 2000, Krifka 2006, Wagner 2006).

- (6) He ... *only* invited [_{covert pied-piping} ex-convicts with RED_F shirts].

 The diagram shows the sentence "He ... only invited [covert pied-piping ex-convicts with RED_F shirts]." with annotations below. A dashed line with an upward arrowhead labeled "movement" spans from the word "invited" to the start of the constituent "[covert pied-piping ex-convicts with RED_F shirts]". A wavy line labeled "focus alternative computation" spans from the start of the constituent to the word "shirts".

More recently, Krifka (2006) and Wagner (2006) have offered independent evidence in support of this view that focus association involves covert movement with pied-piping.

Below we will argue that *covert focus movement with pied-piping* is the correct approach to focus association, by examining the behavior of *focus intervention effects* in focus constructions. To do so, we next introduce focus intervention effects.

³Drubig (1994, p. 6) shows that in Hungarian, an obligatory focus movement language, in sentences parallel to (4), the entire constituent corresponding to "ex-convicts with RED_F shirts" is overtly moved to a pre-verbal focus position.

2.3 Focus intervention effects

One feature of Roothian focus alternative computation is that it is *unselective*; that is, the semantic contribution of a focused constituent is not *indexed* to be only visible to one particular focus-sensitive operator. Therefore if another focus-sensitive operator intervenes, it can interrupt the association of the higher operator with the focused constituent below. Such effects are called *focus intervention effects*, schematized in (7):⁴

(7) **The focus intervention schema (Beck 2006):**

* $Op_1 \dots Op_2 \dots XP_F$


Beck (2006) first discussed focus intervention effects as a solution to so-called *LF intervention effects* in *wh*-questions. An example of this phenomenon is observed in Korean below. Example (8a) is a baseline showing a grammatical *in-situ* object *wh*-question. Example (8b) shows that if the subject “Minsu” is changed to “only Minsu,” the question becomes ungrammatical. Example (8c) shows that the question intended in (8b) can be asked, provided that the object *wh*-word be overtly scrambled to a syntactically higher position than the subject *only*-phrase.

(8) **Intervention effect in Korean *wh*-questions (Beck 2006):**

- a. Minsu-nun nuku-lûl po-ss-ni?
 Minsu-TOP who-ACC see-PAST-Q
 ‘Who did Minsu see?’
- b. * Minsu-man nuku-lûl po-ss-ni?
 Minsu-only who-ACC see-PAST-Q
 Intended: ‘Who did only [MINSU]_F see?’
- c. Nuku-lûl Minsu-man po-ss-ni?
 who-ACC Minsu-only see-PAST-Q
 ‘Who did only [MINSU]_F see?’

Following a view from Hamblin (1973) a.o. that *in-situ wh*-phrases can be interpreted *in-situ* at LF through the projection of alternatives, Beck (2006) proposes that *in-situ wh*-phrases are interpreted precisely using the focus alternative computation mechanism used for the interpretation of focus (Rooth 1985, 1992). Example (9a) below shows this mechanism for an example such as (8a), for illustration purposes using English words and word order. Under this view *wh*-phrases are inherently alternative-generating, with its focus semantic value being the individuals in its domain, corresponding to possible short answers to the *wh*-question (9b). The projection of these alternatives generates alternative propositions in the scope of the complementizer (9c). The entire question at CP, then, is the question whose possible answers correspond to the focus semantic value of TP (9c).

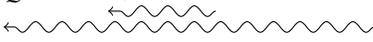
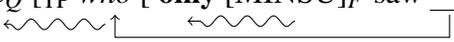
⁴This schema is called the *General Minimality Effect* in Beck (2006, p. 17).

(9) **Interpreting (8a), presented as *wh-in-situ* English:**

- a. $[_{CP} C_Q [_{TP} \text{Minsu saw } \textit{who}]]$

- b. $[[\textit{who}]]^f = \{\text{John, Mary, Bill, ...}\}$
- c. $[[TP]]^f = \{\text{Minsu saw John, Minsu saw Mary, Minsu saw Bill, ...}\}$

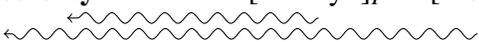
The ungrammaticality of (8b) is due to a focus intervention effect: the alternatives generated by the *wh*-word must be interpreted by the question complementizer in order for the clause to be interpreted properly as a question. However, the intervening focus-sensitive *only* blocks the complementizer from interpreting the *wh*-word's alternatives (8b' below), exemplifying the focus intervention configuration in (7). When the *wh*-word is scrambled above the intervener, however, the *wh*-word's alternatives will be introduced into the focus semantic value above the intervener, allowing it to be interpreted properly by the complementizer (8c'). Potential interveners will be in bold in this paper.

- (8b') * $[_{CP} C_Q [_{TP} \text{only } [\text{MINSU}]_F \text{ saw } \textit{who}]]$

- (8c') $[_{CP} C_Q [_{TP} \textit{who} [\text{only } [\text{MINSU}]_F \text{ saw } __]]]$


Beck's (2006) focus intervention schema also predicts that in sentences with multiple focus association relations between a focus operator and an F-marked constituent, these dependencies cannot be crossing. However, such examples can be constructed. Example (10) is from Beck (2006), attributed to Rooth (1996). Given the context in (10a), example (10b) instantiates the configuration of crossing focus associations predicted to be ungrammatical by the Beck theory, assuming that the focused constituents are interpreted *in-situ* via focus alternative computation. In particular, the *only* in (10b) is predicted to block the proper interpretation of the F-marked *Bob* below by the focus operator *also* above. However, example (10b) is judged to be grammatical with its intended interpretation.⁵

(10) **Crossing focus dependencies (Rooth 1996, as cited in Beck 2006):**

- a. I *only* introduced [MARILYN]_F to John Kennedy.

- b. I *also* **only** introduced [Marilyn]_F to [BOB]_F Kennedy.


The fact that this prediction of Beck's (2006) theory of focus intervention is not borne out must mean that (a) Beck's (2006) logic of focus intervention is not correct and/or (b) the assumption that focused constituents as in (10) are interpreted *in-situ* is not correct.

⁵The F-marked *Marilyn* in (10b) is clearly interpreted as the semantic focus associate of *only*, but it seems to lack a pitch accent. This is referred to as Second Occurrence Focus (SOF) and is licensed by the preceding context (10a), where it is introduced with a pitch accent. It is possible that *Marilyn* here being SOF is precisely what makes (10b) grammatical. See in particular Tomioka (2012) who proposes that SOF is selective, unlike novel focus associations, which are unselective.

We will show in the remainder of this paper that Beck’s (2006) logic of focus intervention is indeed correct, and focus intervention effects *do* affect focus constructions, but instead the assumption that focused constituents are interpreted *in-situ* is the faulty assumption above. In the following section, we will demonstrate focus intervention effects in English *it*-cleft constructions, establishing a baseline for intervention in focus constructions. We will then use focus intervention effects as a diagnostic for regions of focus alternative computation in focus association with VP-level focus operators. We will argue that *covert focus movement with pied-piping* is the correct approach to focus association, and correctly predicts the pattern of intervention that we find.

3. Focus intervention effects in *it*-clefts

It-clefts are an overt focus movement construction in English. The material that occurs in the *pivot* is moved there from its base-generated position inside TP (Chomsky 1977). Example (11) shows that it is possible to pied-pipe different sized material around the F-marked constituent and that these different choices of pivot size do not affect the resulting meaning of the sentence.

(11) **Pied-piping in *it*-clefts:**

John read a book from THIS_F library.

- a. It’s [a book from THIS_F library] that John read ___.
- b. It’s [from THIS_F library] that John read a book ___.
- c. It’s [THIS_F library] that John read a book from ___.

Independent syntactic considerations can constrain the possible size of the moving constituent. For example, if the F-marked element occurs inside an island, the entire island must be pied-piped to the cleft pivot.

(12) ***It*-cleft with island: entire island must be pied-piped (Krifka 2006):**

- a. * It was [a BEER]_F that I met [*island* the man that offered ___ to Sue].
- b. It was [*island* the man who offered [a BEER]_F to Sue] that I met ___.

As first noted by Jackendoff (1972), the cleft semantics introduced by the *it*-cleft operates only on the F-marked constituent inside the pivot, rather than on the entire pivot.⁶ In (13) we see that different choices for the F-marking inside the pivot result in different meanings of what is otherwise the same sentence.

(13) **F-marking in pivot affects meaning of *it*-cleft (Velleman et al. 2012):**

- a. It was [John’s eldest daughter]_F who liked the movie.
⇒ No other people liked the movie.
- b. It was [John’s [ELDEST]_F daughter] who liked the movie.
⇒ None of John’s other daughters liked the movie.

⁶We refer here to “cleft semantics” rather than “exhaustivity” as it is often described in the literature. See Horn (1981, to appear), Velleman et al. (2012) on the status of the exhaustivity inference of clefts.

- (16) a. * It's [**few** books from THIS_F library] that John read ____.
 b. It's [from THIS_F library] that John read [**few** books ____].
 c. It's [THIS_F library] that John read [**few** books from ____].
- (17) a. * It's [**only**_i BOOKS_{F,i} from THIS_F library] that John read ____.
 b. It's [from THIS_F library] that John read [**only** BOOKS_F ____].
 c. It's [THIS_F library] that John read [**only** BOOKS_F from ____].
- (18) a. * It's [**the most** books from THIS_F library] that John read ____.
 b. It's [from THIS_F library] that John read [**the most** books ____].
 c. It's [THIS_F library] that John read [**the most** books from ____].

In the next section we turn our attention to focus association with VP-level operators and show that focus intervention effects occur in a small region *near* and *above* the F-marked constituent, which we argue is covertly pied-piped. The same set of interveners as above is shown to cause this effect. We argue that this finding lends support to the view that focus association is interpreted using *covert movement with pied-piping* and is unpredicted by the view that focus association is interpreted completely *in-situ*.

4. Diagnosing covert pied-piping in focus association

In the past section we demonstrated that *focus intervention effects*, schematized in (7) repeated below, do affect the interpretation of focus alternative computation in focus constructions, as predicted by Beck (2006). In particular, in English *it*-clefts, focus alternative computation is used *inside* the pied-piping around the F-marked constituent. When a focus-sensitive operator such as negation, *only*, *few*, and *the most* occurs in this region, the result is ungrammatical.

(7) **The focus intervention schema (Beck 2006):**

* *Op*₁ ... *Op*₂ ... XP_F
 ~~~~~  
 ←~~~~~

In this section we turn our attention to focus association constructions where the focused constituent has not been displaced. Recall that there are two approaches to such constructions, illustrated in (1), repeated below. The first is to interpret the F-marked constituent *in-situ* at LF, using focus alternative computation all the way up to the focus operator (1a) (Rooth 1985, 1992). The second is to covertly move the F-marked constituent, possibly with some pied-piped material around it, to the focus operator (1b) (Drubig 1994, Krifka 2006, Wagner 2006).

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Similarly, Taglicht (1984) discusses other cases where a focus operator grammatically occurs immediately prior to the cleft pivot, such as in *It was also John who protested* (Taglicht 1984, p. 173). Here, Taglicht himself offers an explanation which helps clarify the issue: this example is grammatical on a reading where *also* operates above the cleft, associating with the predicate *protested*, rather than being part of the pivot. Furthermore, this sentence could not be generated through the movement of *also John* as a constituent from subject position, as *\*Also John protested* is ungrammatical.

(1) **Two approaches to interpreting focus:**

a. I *only* read a book from THIS<sub>F</sub> library.

←~~~~~  
focus alternative computation

b. I ... *only* read [*covert pied-piping* a book from THIS<sub>F</sub> library].

↑-----↓      ←~~~~~  
movement      focus alternative computation

These two approaches make very different predictions regarding where focus intervention may occur. Under the *in-situ* interpretation view (1a), focus alternative computation is used everywhere between the F-marked constituent and the focus operator, predicting that this entire region is susceptible to focus intervention effects. In contrast, under the covert movement view (1b), focus alternative computation is only used inside the pied-piping that may exist around the F-marked constituent. This approach predicts that focus intervention effects should occur only *inside* the covertly pied-piped constituent. **We thus are able to use the (in)sensitivity to focus intervention effects as a diagnostic for the existence and size of covert focus movement and pied-piping in focus association constructions.**

We begin with example (19), where sentential negation is placed between the F-marked constituent and its associated focus operator *only*.<sup>10</sup> The grammaticality of (19) is unexpected by the *in-situ* interpretation approach, as the negation would be predicted to interfere with the focus alternative computation for *only* (7). Such examples were discussed as a potential problem for the theory of focus intervention itself in Beck (2006). We argue that the grammaticality of (19) shows that F-marked constituents are not interpreted *in-situ* using only focus alternative computation and instead involve covert focus movement.

(19) **Lack of intervention by sentential negation:**

I *only* **didn't** read a book from THIS<sub>F</sub> library.

Having motivated the covert movement view, our next task is to determine the size of the region that is pied-piped along with the F-marked constituent. For a sentence as in (20), we can imagine at least the following three options. Note that all three covert pied-piping options in (20a–c) will result in the same pronunciation and the same semantics for (20).<sup>11</sup>

<sup>10</sup>Sentential negation generally acts as an intervener in *wh*-questions, where focus intervention effects with the same logic are argued to occur (Beck 2006). In English, we see this behavior in superiority-violating multiple *wh*-questions. In such questions, the *wh*-phrase pronounced *in-situ* must be interpreted using focus alternative computation. The region above the *in-situ wh* in superiority-violating questions is thus sensitive to intervention effects. Example (i) below from Pesetsky (2000) shows that sentential negation is an intervener in this configuration. See Pesetsky (2000) for more data and Beck (2006) for an analysis.

(i) \* Which book **didn't** which boy read \_\_\_?

<sup>11</sup>(ii) shows a semantics for *only* under the focus movement approach that correctly predicts no sensitivity to the size of pied-piping in the pivot. This semantics uses focus alternative computation *inside* the pied-piped constituent to identify the F-marked element, predicting sensitivity to intervention in this region.

(ii)  $\llbracket \text{only}(\alpha)(\beta) \rrbracket$  evaluated in world  $w$ : (see Horn 1969)

a. asserts for all  $x$  in  $\llbracket \alpha \rrbracket^f$  where  $x \neq \llbracket \alpha \rrbracket^o$ ,  $\llbracket \beta \rrbracket^o(x)$  is false in  $w$ , and  
 b. presupposes  $\llbracket \beta \rrbracket^o(\llbracket \alpha \rrbracket^o)$  is true in  $w$ .

(20) **Possible pied-piping in covert focus movement:**

I *only* read a book from THIS<sub>F</sub> library.

- a. only(a book from THIS<sub>F</sub> library)( $\lambda x$ . I read  $x$ )
- b. only(from THIS<sub>F</sub> library)( $\lambda x$ . I read a book  $x$ )
- c. only(THIS<sub>F</sub> library)( $\lambda x$ . I read a book from  $x$ )

Here too we can use focus intervention as a diagnostic, this time for the *size* of covert focus pied-piping. That is, if any material is pied-piped, we predict a region right above the F-marked constituent—between the F-marked constituent and the edge of the covert pied-piping—to be sensitive to intervention effects. Example (21) shows this effect:<sup>12</sup>

(21) **Intervention by DP-internal *no*:**

\* I *only* read **no** book from THIS<sub>F</sub> library.

The contrast between the sentential negation in (19) and the DP-internal negation in (21) shows that the problem with (21) is not simply caused by the presence of negation, but rather by negation inside the covertly pied-piped constituent. Furthermore, example (22) below shows that this effect is not caused simply by having *no* in the sentence: if the negation occurs *below* the F-marked constituent, no intervention is caused.

(22) I *only* read THIS<sub>F</sub> book containing **no** monsters.

In addition to negation, we also see similar intervention effects in covert pied-piping constituents with other interveners such as *few* and *the most* as shown in (23) below.

(23) **Other DP-internal interveners:**

- a. \* I *only* read **few** books from THIS<sub>F</sub> library.
- b. \* I *only* read **the most** books from THIS<sub>F</sub> library.

The ungrammaticality of (21, 23) shows that *only the largest pied-piping option in (24) was available* for covert focus movement.<sup>13</sup> This finding is particularly surprising since we have already seen that no such restriction on the size of pied-piping applies to overt focus movement. The pied-piping in (24b, c) are grammatical choices for *it*-cleft pivots, (15b, c).

- (24) a. I *only* read [<sub>covert pied-piping</sub> **no** book from THIS<sub>F</sub> library].  
⇒ predicts intervention!
- b. I *only* read **no** book [<sub>covert pied-piping</sub> from THIS<sub>F</sub> library].  
⇒ predicts no intervention
- c. I *only* read **no** book from [<sub>covert pied-piping</sub> THIS<sub>F</sub> library].  
⇒ predicts no intervention

<sup>12</sup>The baseline use of *no* in object position can be slightly degraded for some speakers. For some speakers it can improve in the perfect, as in *I've read no book from this library*. For such speakers, we note that example (21) is still ungrammatical in the perfect: *\*I've only read no book from THIS<sub>F</sub> library*.

<sup>13</sup>Recall that we did not observe intervention effects in example (19). Combined with our conclusion here that covert pied-piping prefers to be as large as possible, example (19) teaches us that a constituent large enough to contain the sentential negation (the entire sister of *only*) is not a candidate for pied-piping.

### *Intervention in focus pied-piping*

Formally, the preference for larger covert pied-piping could be thought of as a transderivational application of the constraint Attract Closest (Relativized Minimality: Rizzi 1990; Minimal Link Condition: Chomsky 1995, 2000; also Shortest Move: Chomsky 1993). That is, we could imagine the grammar considering the three derivations in (24) in parallel, differing only in the extent of pied-piping. The derivation with the largest pied-piping (24a) will result in the optimal satisfaction of Attract Closest-type constraints for the probing of the focus-pied-piped constituent by *only*.<sup>14</sup>

Recall that if the F-marked constituent is inside an island, the focus movement approach predicts that the entire island is moved. This might predict that intervention occurs inside the entire island, if the F-marked constituent is interpreted *in-situ* inside the island and utilizes focus alternatives computation to reach the edge of the pied-piping, as in (25).

(25) I ... *only* read [<sub>island</sub> the books [that Mary read \_\_\_ at SCHOOL<sub>F</sub>]].

However, as we can observe in (26), this does not seem to be the case:

(26) I *only* read [the books [that Mary **didn't** read \_\_\_ at SCHOOL<sub>F</sub>]].

Following Drubig (1994) (in turn based on a proposal for *wh*-pied-piping by Nishigauchi (1990)), we propose that in clause-sized islands, the F-marked constituent can move *inside* the island, thus predicting a smaller region that would be sensitive to intervention effects:<sup>15</sup>

(26') I ... *only* read [<sub>island</sub> the books [... that Mary **didn't** read \_\_\_ at SCHOOL<sub>F</sub>]].

Indeed, if an intervener is placed inside the DP but outside of the relative clause, an intervention effect is observed.

- (27) a. \* I *only* read [**no** book that [Mary read \_\_\_ at SCHOOL<sub>F</sub>]].  
 b. \* I *only* read [**few** books that [Mary read \_\_\_ at SCHOOL<sub>F</sub>]].  
 c. \* I *only* read [**the most** books that [Mary read \_\_\_ at SCHOOL<sub>F</sub>]].

Finally, we would like to acknowledge that the contrasts we describe here as focus intervention effects seem to be less clear when the higher focus operator is not *only*. Although the contrasts are replicated with focus-sensitive negation (28), examples parallel to (21) and (23) but with a VP-level *even* or *also*, instead of *only*, are judged as natural or only slightly degraded.<sup>16</sup>

<sup>14</sup>One could also imagine another proposal similar in spirit, in which the determination of pied-piping size happens countercyclically. In this variant, *only* probes from above and countercyclically produces a focus phrase to Attract. Due to the top-down nature of probing (Chomsky 2000), this would also yield a preference for larger focus pied-piping. In this paper we will leave open such questions about the deeper motivations for the preference for larger pied-piping.

<sup>15</sup>Note that Drubig (1994) proposes that the F-marked constituent moves to the edge of the *entire* island, regardless of the island's category. Instead, the contrast here motivates movement of the F-marked constituent only to the edge of clauses. Focus intervention is therefore predicted within DPs without clause-level projections, (21, 23), and outside of clauses within DPs, (27).

<sup>16</sup>The combination of the focus-sensitive sentential negation and intervener *no* is not tested, as it may be degraded for other reasons. Similarly, the combination of *even/also* with *the most* is not tested due to an inherent incompatibility between their meanings.

- (28) a. \* I *didn't* read **few** books from THIS<sub>F</sub> library.  
 b. \* I *didn't* read **the most** books from THIS<sub>F</sub> library.
- (29) a. I *even* read **no** book from THIS<sub>F</sub> library.  
 b. ? I *even* read **few** books from THIS<sub>F</sub> library.
- (30) a. I *also* read **no** book from THIS<sub>F</sub> library.  
 b. I *also* read **few** books from THIS<sub>F</sub> library.

The contrast between our core data involving VP-*only* and negation and the behavior of *even* and *also* is a puzzle. Assuming that the options for focus association are either covert focus movement with pied-piping or completely *in-situ* interpretation through focus alternative computation, we would expect intervention to occur in at least the configurations above. We will leave this puzzle open for future work.

## 5. Conclusion

In this paper we motivated the use of *focus intervention effects* as a diagnostic for regions of focus alternative computation, resulting in a new argument for the covert movement approach to focus association. We demonstrated that the pivot of English *it*-clefts is sensitive to focus intervention effects, substantiating Beck's (2006) conjecture that focus intervention effects occur not only in *wh*-questions, but also in focus constructions. We then used this diagnostic to argue for the presence of *covert pied-piping* in focus association constructions with VP-level focus operators. We showed that intervention effects occur in a small region *near* and *above* the F-marked element in these constructions. Our findings are consistent with the approach to focus association which involves covert movement with pied-piping, and are not predicted under the view that the F-marked constituent remains *in-situ* and is interpreted solely using focus alternative computation. This is a new argument in favor of the covert focus movement with pied-piping approach to focus association, previously proposed by Drubig (1994) and supported by Krifka (2006) and Wagner (2006).

Using focus intervention effects as a diagnostic for the size of covert pied-piping, we showed that only the *largest* pied-piping option is available for covert focus movement. This contrasts sharply with options for overt focus pied-piping demonstrated in the *it*-cleft, where multiple choices for the size of the pied-piping were available. This evidence is parallel to the findings of our previous work in Kotek and Erlewine (2013), where we showed that covert pied-piping of *wh*-phrases must also choose the largest available option. The core data is given below, where we see that although there are several options for overt *wh*-pied-piping in (31), only the largest option can predict the pattern of intervention effects with covert pied-piping shown in (32). We refer the reader to Kotek and Erlewine (2013) for more discussion of the data and its analysis.

- (31) **Intervention in overt *wh*-pied-piping (Cable 2007):**
- a. \* [*pied-piping* **No** pictures of *which* president] does Jim own \_\_\_?  
 b. [*pied-piping* **Of** *which* president] does Jim own **no** pictures \_\_\_?  
 c. [*pied-piping* **Which** president] does Jim own **no** pictures of \_\_\_?

### *Intervention in focus pied-piping*

- (32) **Intervention in covert *wh*-pied-piping (Kotek and Erlewine 2013):**  
\* Which student read **no** book from *which* library?
- (33) **Possible choices of covert pied-piping in (32):**
- a. Which student read [*covert pied-piping* **no** book from *which* library].  
⇒ predicts intervention!
  - b. Which student read **no** book [*covert pied-piping* from *which* library].  
⇒ predicts no intervention
  - c. Which student read **no** book from [*covert pied-piping* *which* library].  
⇒ predicts no intervention

Much previous work on the syntax/semantics of *wh*-questions and focus constructions has considered just one or the other phenomenon in isolation. The sensitivity of both *wh*- and focus-pied-piping to focus intervention effects motivates a view under which the two phenomena are closely related. We believe that further research at this intersection and the cross-fertilization of theories in these areas are warranted.

### **References**

- Beaver, David, and Brady Clark. 2008. *Sense and sensitivity: How focus determines meaning*. Wiley-Blackwell.
- Beck, Sigrid. 2006. Intervention effects follow from focus interpretation. *Natural Language Semantics* 14:1–56.
- Cable, Seth. 2007. The grammar of Q. Doctoral Dissertation, Massachusetts Institute of Technology.
- Chomsky, Noam. 1977. On *wh*-movement. In *Formal syntax*, ed. Peter Culicover, Thomas Wasow, and Adrian Akmajian, 71–132. New York: Academic Press.
- Chomsky, Noam. 1993. A minimalist program for linguistic inquiry. In *The view from Building 20*, ed. Kenneth Hale and Samuel Jay Keyser. MIT Press.
- Chomsky, Noam. 1995. *The minimalist program*. MIT Press.
- Chomsky, Noam. 2000. Minimalist inquiries: the framework. In *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*. MIT Press.
- Drubig, Hans Bernhard. 1994. Island constraints and the syntactic nature of focus and association with focus. *Arbeitspapiere des Sonderforschungsbereichs 340: Sprachtheoretische Grundlagen der Computerlinguistik* 51.
- Hamblin, Charles. 1973. Questions in Montague English. *Foundations of Language* 10:41–53.
- Horn, Laurence R. 1969. A presuppositional analysis of *only* and *even*. In *Proceedings of CLS 5*, 98–107. Chicago Linguistics Society.
- Horn, Laurence R. 1981. Exhaustiveness and the semantics of clefts. In *Proceedings of NELS 11*, 125–142.
- Horn, Laurence R. to appear. Only connect: How to unpack an exclusive proposition. To appear in a festschrift for Jay Atlas.

- Horvath, Julia. 2000. Interfaces vs. the computational system in the syntax of focus. In *Interface strategies*, 183–206.
- Jackendoff, Ray. 1972. *Semantic interpretation in generative grammar*. MIT Press.
- Kotek, Hadas, and Michael Yoshitaka Erlewine. 2013. Covert pied-piping in English multiple *wh*-questions. URL <http://ling.auf.net/lingbuzz/001736>, manuscript, MIT.
- Krifka, Manfred. 2006. Association with focus phrases. In *The architecture of focus*, 105–136. Mouton de Gruyter.
- Nishigauchi, Taisuke. 1990. *Quantification in the theory of grammar*. Kluwer.
- Partee, Barbara Hall. 1991. Topic, focus, and quantification. In *Proceedings of SALT 1*, 159–187.
- Pesetsky, David. 2000. *Phrasal movement and its kin*. MIT Press.
- Rizzi, Luigi. 1990. *Relativized minimality*. MIT Press.
- Rooth, Mats. 1985. Association with focus. Doctoral Dissertation, University of Massachusetts, Amherst.
- Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1:75–116.
- Rooth, Mats. 1996. On the interface principles for intonational focus. In *Proceedings of SALT 6*, 202–226.
- Sauerland, Uli, and Fabian Heck. 2003. LF-intervention effects in pied-piping. In *Proceedings of NELS 33*.
- Selkirk, Elisabeth O. 1996. Sentence prosody: Intonation, stress, and phrasing. In *The handbook of phonological theory*, ed. John A. Goldsmith, 550–69. London: Basil Blackwell.
- Taglicht, Josef. 1984. *Message and emphasis: on focus and scope in English*. Longman.
- Tomioka, Satoshi. 2012. Focus matters in neo-Hamblin semantics. Presented at GLOW 35 Workshop on Association with Focus, May 2012.
- Velleman, Dan Bridges, David Beaver, Emilie Destruel, Dylan Bumford, Edgar Onea, and Liz Coppock. 2012. It-clefts are IT (inquiry terminating) constructions. In *Proceedings of SALT 22*, 441–460.
- Wagner, Michael. 2006. Association by movement: evidence from NPI-licensing. *Natural Language Semantics* 14:297–324.

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