

# Focus intervention effects revisited: A semantics-pragmatics approach

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## 1 Introduction

This paper aims to provide a new account for **focus intervention effects** in ***wh*-in-situ languages** like Korean and Chinese (see e.g., [Kim 2002](#); [Beck 2006](#); [Li and Law 2016](#)). In these languages, *wh*-questions usually do not involve the fronting of *wh*-items (see *mwusun* in (1) and *shén-me* in (2)).<sup>1</sup>

- (1) Mary-nun mwusun chayk-ul ilk-ess-ni?  
Mary-TOPIC what book-ACC read-PAST-Q  
‘What book(s) did Mary read?’ **Korean (SOV): *wh*-in-situ**
- (2) Mary dú-le shén-me shū?  
Mary read-PFV what book  
‘What book(s) did Mary read?’ **Chinese (SVO): *wh*-in-situ**

However, when there is a focus item in a *wh*-question (see *-man* in (3) and *zhǐ-yǒu* in (4)), the *wh*-in-situ version with the pattern ‘***only ... wh***’ (see (3a) and (4a)) is judged degraded. In contrast, the *wh*-movement version with the pattern ‘***wh ... only***’ (see (3b) and (4b)) sounds natural (see (5)).

<sup>1</sup> For transcription in examples, I use [Pinyin](#) for Chinese and [Yale Romanization](#) for Korean.

- 14 (3) a. \* [Mary]<sub>F</sub>-man mwusun chayk-ul ilk-ess-ni?  
 Mary-ONLY what book-ACC read-PAST-Q  
 15 Intended: ‘What is the book-sum  $x$  s.t. only Mary read  $x$ ?’  
 16 b. mwusun chayk-ul [Mary]<sub>F</sub>-man ilk-ess-ni?  
 what book-ACC Mary-ONLY read-PAST-Q  
 17 ‘What book(s) did Mary read?’ **Korean**
- 18 (4) a. \* zhǐ-yǒu [Mary]<sub>F</sub> dú-le shén-me shū?  
 only Mary read-PFV what book  
 19 Intended: ‘What is the book-sum  $x$  s.t. only Mary read  $x$ ?’  
 20 b. shén-me shū zhǐ-yǒu [Mary]<sub>F</sub> dú-le?  
 what book only Mary read-PFV  
 21 ‘What book(s) did Mary read?’ **Chinese**
- 22 (5) Generalizations on **focus intervention effects**:  
 23 a. Degraded pattern: *only* ... *wh* ***wh*-in-situ + focus ✗**  
 24 b. Acceptable pattern: *wh* ... *only* ***wh*-movement + focus ✓**

25 In the existing literature on intervention effects, the degraded pattern (5a)  
 26 has often been attributed to derivational failure (see e.g., Beck 2006; Li and  
 27 Law 2016). However, it has also been pointed out that there is variation among  
 28 native speakers’ judgments (see Tomioka 2007).

29 Inspired by works on **post-suppositions** (see e.g., Brasoveanu 2013; Bum-  
 30 ford 2017), I propose a new semantics-pragmatics account for intervention  
 31 effects data. Both focus items like *only* and *wh*-items bring relativized max-  
 32 imality/definiteness requirements that need to be checked at a global, sen-  
 33 tential level, as post-suppositions. When *only* and *wh*-items appear together,  
 34 their relativized maximality/definiteness requirements cannot be met, leading  
 35 to meaning triviality in using *only*. Thus the degraded pattern (5a) is not due  
 36 to derivational crash, but rather meaning triviality. I also propose that the ac-  
 37 ceptable pattern (5b) has a covert distributivity operator associated with the  
 38 fronted *wh*-item, helping (5b) avoid triviality/uninterpretability.

39 The rest of the paper is organized as follows. Section 2 presents new em-  
 40 pirical observations on how sentences with *only* are interpreted, showing a  
 41 crucial contrast between declarative sentences and *wh*-questions. Based on  
 42 these observations, Section 3 explains why a relativized reading for *only* is  
 43 never available in *wh*-questions and accounts for the generalizations in (5).  
 44 Section 4 compares the current proposal with existing studies on intervention  
 45 effects and addresses advantages of the current proposal. Section 5 concludes.

## 46 2 New empirical observations

47 Here I show that when a focus item like *only* appears in a **declarative sen-**  
 48 **tence** vs. a ***wh*-question**, the interpretations of *only* are not exactly the same.

49 **2.1 The interpretation of declarative sentences with *only***

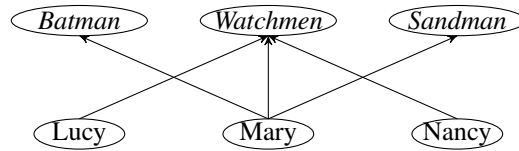
50 Cross-linguistically, **declarative sentences with *only*** have two readings. The  
 51 availability of these two readings is evidenced by our truth-value judgments  
 52 of sentences in (6) under different scenarios (see (7) and (8)).

53 (6) **Declarative sentences with *only***

- 54 a. **English:** Only [Mary]<sub>F</sub> read *Batman* and *Sandman*.  
 55 b. **Korean:**  
 56 [Mary]<sub>F</sub>-man Batman-kwa Sandman-ul ilk-ess-ta  
 Mary-ONLY Batman-and Sandman-ACC read-PAST-DECL  
 57 c. **Chinese:**  
 58 zhǐ-yǒu [Mary]<sub>F</sub> dú-le *Batman* hé *Sandman*  
 only Mary read-PFV Batman and Sandman

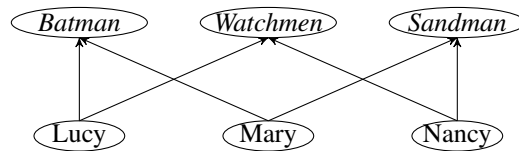
59 Declarative sentences in (6) are true under the scenario in (7). Under this  
 60 scenario, *Batman* and *Sandman* are books that have the property of having a  
 61 unique reader, Mary. In this case, what is under consideration is each atomic  
 62 book  $x$  and whether the property  $\lambda x$ . [only Mary read  $x$ ] holds true for  $x$ .

63 (7) **Scenario 1 (‘distributive’ scenario):** Mary read all the three books,  
 64 while Lucy and Nancy only read one book, *Watchmen*.  
 65



67 Declarative sentences in (6) are also true under the scenario in (8). Under  
 68 this scenario, no book has a unique reader. Sentences in (6) are true because  
 69 Mary is unique in reading the combination of books ‘*Batman* and *Sandman*’.  
 70 Here the uniqueness of Mary is based on the entire rest of the sentence, i.e.,  
 71 read *Batman* and *Sandman*. *Only Mary* is interpreted at the sentential level.

72 (8) **Scenario 2 (‘collective’ scenario):** Lucy, Mary, and Nancy each read  
 73 two books. Only Mary read the combination ‘*Batman* and *Sandman*’.  
 74



75

76 Therefore, each of the sentences in (6) has two readings.  
 77 In one reading, as interpreted under Scenario 1 in (7), *only Mary (read)*  
 78 is interpreted **in an absolute sense**. The meaning of *only Mary (read)*  
 79 is computed **locally** (i.e., the property  $\lambda x.[\text{only Mary read } x]$  is first derived),  
 80 independent of the part *Batman and Sandman*.

81 In the other reading, as interpreted under Scenario 2 in (8), *only Mary* is  
 82 interpreted **in a relative sense**. The meaning of *only Mary* cannot be fully  
 83 computed until at the sentential level. The uniqueness of Mary is checked in  
 84 a delayed manner, involving the information ‘*Batman and Sandman*’.

85 Thus sentences in (6) are reminiscent of **superlatives**, which can be inter-  
 86 preted in an **absolute** way vs. a **relative** way (see (9)). According to Bumford  
 87 (2017), the absolute reading of *the tallest mountain* (see (9a)) is based on a  
 88 local, DP-level interpretation of this superlative: the maximality/definiteness  
 89 requirement is applied at the DP level and picks out the tallest mountain in  
 90 the domain (e.g., in our actual world, the Everest). In contrast, the relative  
 91 reading of *the tallest mountain* (see (9b)) is based on a more global interpre-  
 92 tation of this superlative: the maximality/definiteness requirement is applied  
 93 at a higher level and picks out the tallest mountain climbed by some girl.

- 94 (9) The girl who climbed the tallest mountain (see e.g., Bumford 2017)  
 95 a. **The absolute reading of *the tallest mountain*:**  
 96  $\rightsquigarrow$  the tallest mountain in the world, i.e., the Everest  
 97 b. **The relative reading of *the tallest mountain*:**  
 98  $\rightsquigarrow$  the tallest mountain climbed by some girl

99 In Section 3, I will present Bumford (2017)’s analysis of superlatives and  
 100 propose to analyze focus expressions like *only Mary* in the same way.<sup>2</sup>

## 101 2.2 The interpretation of *wh*-questions with *only*

102 In *wh*-questions, if *only Mary* is interpreted in exactly the same way as in  
 103 declarative sentences, we would expect that there are also two interpretations:  
 104 a DP-level, absolute interpretation of *only Mary*, as well as a sentence-level,  
 105 relative interpretation of *only Mary*. The prediction is that for *wh*-questions in  
 106 (10), *Batman and Sandman* would be a true and felicitous answer under both  
 107 Scenarios 1 and 2 (see (7) and (8)). However, this prediction is not borne out.

- 108 (10) **Acceptable *wh*-questions with the pattern ‘*wh ... only*’**  
 109 a. What books did only [Mary]<sub>F</sub> read? **English**  
 110 b. mwusun chayk-ul [Mary]<sub>F</sub>-man ilk-ess-ni? **Korean (= (3b))**  
 111 c. shén-me shū zhǐ-yǒu [Mary]<sub>F</sub> dú-le? **Chinese (= (4b))**

<sup>2</sup>The absolute vs. relative readings of superlatives and *only Mary* seem also reminiscent of scope taking. I follow Bumford (2017) and do not pursue a scope-taking-based account for them.

112 As summarized in (11), we intuitively feel that under Scenario 1 (see (7)),  
 113 *Batman and Sandman* is a true and felicitous answer, while under Scenario 2  
 114 (see (8)), this is not a true answer. Actually, our intuition is that for Scenario  
 115 2, *wh*-questions in (10) can only be answered with *none*, because none of the  
 116 books have a unique reader.

- 117 (11) Answers to the questions in (10)
- 118 a. *Batman and Sandman*. ✓under Scenario 1 (see (7))
  - 119 b. *Batman and Sandman*. ✗under Scenario 2 (see (8))

120 The contrast in (11) indicates that *wh*-questions in (10) can only be in-  
 121 terpreted as addressing ‘which books have the property of having a unique  
 122 reader, Mary’, never interpreted as addressing ‘Mary is unique in reading a  
 123 certain combination of books, and what this book-combination is’. In other  
 124 words, in these *wh*-questions, *only Mary* can only be interpreted in an abso-  
 125 lute sense, but never in a relative sense.

### 126 2.3 Generalizations

127 When combined together, Sections 2.1 and 2.2 show that the interpretation(s)  
 128 of *wh*-questions with *only* does not match exactly with the interpretation(s) of  
 129 corresponding declarative sentences with *only*. As shown in (12), a sentence-  
 130 level, relativized interpretation for *only Mary*, which is available for declar-  
 131 ative sentences, is never attested for *wh*-questions. *Wh*-questions containing  
 132 *only Mary* can only have a DP-level, absolute interpretation for *only Mary*.

- 133 (12) a. **Declarative sentences with *only*:**
- 134 (i) ✓a DP-level, absolute interpretation for *only Mary*
  - 135 (ii) ✓a sentence-level, relative interpretation for *only Mary*
- 136 b. ***Wh*-questions with the acceptable pattern ‘*wh ... only*’:**
- 137 (i) ✓a DP-level, absolute interpretation for *only Mary*
  - 138 (ii) ✗a sentence-level, relative interpretation for *only Mary*

## 139 3 Proposal

140 I follow Brasoveanu (2013) and Bumford (2017)’s studies on post-suppositions  
 141 and propose a post-suppositional perspective in analyzing focus items and  
 142 *wh*-items (Section 3.1). Then, in Section 3.2, I explain why a sentence-level,  
 143 relativized interpretation of focus items is never possible in *wh*-questions.  
 144 Finally, in Section 3.3, I account for the judgment contrast between ‘*only*  
 145 *... wh*’ and ‘*wh ... only*’ (see (5)), proposing that the availability of the DP-  
 146 level, absolute interpretation of focus items hinges on *wh*-movement and the  
 147 use of a covert distributivity operator. After all, the pattern ‘*only ... wh*’ is  
 148 degraded because it has no felicitous interpretation.

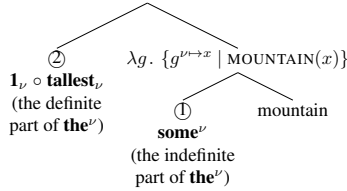
149 **3.1 A post-suppositional view on *wh*-items and focus**

150 **Bumford (2017)** adopts dynamic semantics to analyze the absolute and relative readings of superlatives. Within dynamic semantics, meaning derivation is considered a series of updates from an information state to another. Here  
 151 an information state  $m$  (of type  $g \rightarrow \{g\}$ ) is represented as a function from  
 152 an input assignment function to an output set of assignment functions.  
 153  
 154

155 (13) The<sup>*u*</sup> girl who climbed the<sup>*v*</sup> tallest mountain (= (9))

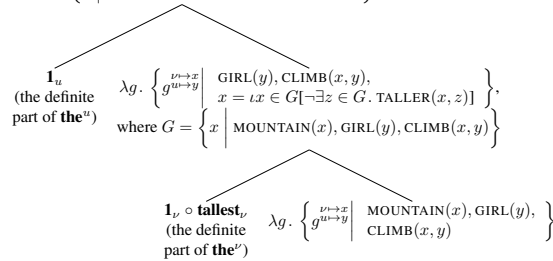
156 a. **The absolute reading of the<sup>*v*</sup> tallest mountain**

157 
$$\lambda g. \{g^{v \rightarrow x} \mid x = \iota x \in G[\neg \exists z \in G. \text{TALLER}(x, z)]\},$$
 where  $G = \{x \mid \text{MOUNTAIN}(x)\}$



158 b. **The relative reading of the<sup>*v*</sup> tallest mountain**

159 
$$\lambda g. \left\{ \begin{array}{l} g^{v \rightarrow x} \\ g^{u \rightarrow y} \end{array} \middle| \begin{array}{l} x = \iota x \in G[\neg \exists z \in G. \text{TALLER}(x, z)], \\ y = \iota y[\text{GIRL}(y) \wedge \text{CLIMB}(x, y)] \end{array} \right\},$$
 where  $G = \left\{ x \mid \begin{array}{l} \text{MOUNTAIN}(x), \text{GIRL}(y), \text{CLIMB}(x, y) \end{array} \right\}$



160 As illustrated in (13), **Bumford (2017)** splits the semantic contribution of  
 161 definite determiner *the* into two parts. In (13a), in ①, the **indefinite** part of  
 162 **the<sup>*v*</sup>** first introduces discourse referents (drefs) in a non-deterministic way.  
 163 After relevant restrictions are added (here  $\text{MOUNTAIN}(x)$ ), in ②, the **definite**  
 164 part of **the<sup>*v*</sup>** contributes definiteness, picking out the unique mountain that is  
 165 taller than all other mountains in the domain. **The absolute reading** of this  
 166 superlative, *the tallest mountain*, is thus derived.

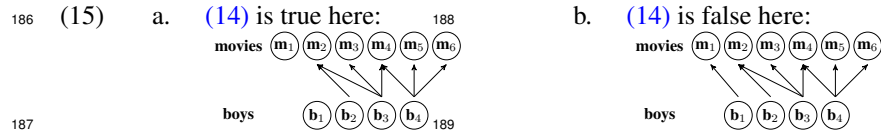
167 In (13b), after the indefinite part of **the<sup>*v*</sup>** introduces drefs in a non-  
 168 deterministic way (this part is omitted in the tree), definiteness contributed  
 169 by **the<sup>*v*</sup>** is not at work immediately. It is after another dref is introduced and  
 170 more restrictions are added (here  $\text{GIRL}(y)$  and  $\text{CLIMB}(x, y)$  – see the bottom  
 171 right part of the tree) that definiteness tests eventually come to work. In (13b),

172 these **delayed, post-suppositional tests** pick out (i) the unique mountain that  
 173 is taller than all other mountains climbed by some girl in the domain and (ii)  
 174 the unique girl who climbed this unique mountain. **The relative reading** of  
 175 this superlative, *the tallest mountain*, is thus derived.

176 [Bumford \(2017\)](#)’s post-suppositional account for definite determiner *the* in  
 177 the relative reading of superlatives is in the same spirit as [Brasoveanu \(2013\)](#)’s  
 178 account for **modified numerals in cumulative-reading sentences**.

179 (14) is intuitively true under the scenario of (15a), but false under the sce-  
 180 nario of (15b), indicating that the interpretation of modified numerals like  
 181 *exactly 3 NP* and *exactly 5 NP* should be relativized. The cumulative reading  
 182 of (14) counts the cardinality of all boys that saw some movies and all movies  
 183 seen by some boys, not the cardinality of all boys and movies in the domain.

184 (14) Exactly 3<sup>u</sup> boys saw exactly 5<sup>v</sup> movies. **Cumulative<sup>3</sup>**  
 185 *exactly 3*: not counting all the boys, but all boys who saw movies



190 Thus modified numerals in (14) work in the same way as definite deter-  
 191 miner *the* in (13), with a two-fold semantic contribution. As shown in (16a),  
 192 modified numerals first introduce (potentially plural) drefs,  $x$  and  $y$ , in a non-  
 193 deterministic way, and various restrictions are added onto these drefs. Then  
 194 as shown in (16b), modified numerals contribute post-suppositions, checking  
 195 definiteness and cardinality requirements (see (17) and (18)). The cumulative  
 196 reading of (14) is true if  $u$  and  $v$  are assigned to the (mereologically) maximal  
 197 boy-sum and movie-sum and their cardinalities are equal to 3 and 5.

198 (16) **A post-suppositional analysis of modified numerals for (14)**

- 199 a. **Introducing drefs:**  $p = \llbracket \text{some}^u \text{ boys saw some}^v \text{ movies} \rrbracket =$   
 200  $\lambda g. \left\{ g^{u \mapsto x} \mid \text{MOVIE}(y), \text{BOY}(x), \text{SAW}(x, y) \right\}$   
 201 b. **Checking maximality and cardinality as post-suppositions:**  
 202  $\llbracket (14) \rrbracket = \llbracket \text{exact } 3^u \text{ boys saw exactly } 5^v \text{ movies} \rrbracket$   
 203  $= \mathbf{M}_{u,v}(p), \text{ if } |x| = 3 \wedge |y| = 5$   
 204  $= \lambda g. \left\{ \begin{array}{l} g^{u \mapsto x} \mid y = \sigma y. [\text{MV}(y) \wedge \exists x. [\text{BOY}(x) \wedge \text{SAW}(x, y)]] \\ g^{v \mapsto y} \mid x = \sigma x. [\text{BOY}(x) \wedge \exists y. [\text{MV}(y) \wedge \text{SAW}(x, y)]] \end{array} \right\},$   
 205  $\text{if } |x| = 3 \wedge |y| = 5$

<sup>3</sup> Sentence (14) has also a distributive reading: there are exactly 3 boys such that each of them saw exactly 5 movies. This distributive reading is not discussed in this paper.

206 (17) **Maximality operator:** (mereology-based)

207  $\mathbf{M}_\nu \stackrel{\text{def}}{=} \lambda m. \lambda g. \{h \in m(g) \mid \neg \exists h' \in m(g). h(\nu) \sqsubset h'(\nu)\}$

208 (18) **Cardinality test:**  $\mathbf{5}_\nu \stackrel{\text{def}}{=} \lambda m. \lambda g. m(g)$ , if  $|g(\nu)| = 5$

209 Now I show that focus items (e.g., *only Mary*) and *wh*-items work just like  
210 definite determiner *the* and modified numerals, with a two-fold meaning.

211 As shown in (19), focus item *only Mary* first introduces a (potentially plu-  
212 ral) dref,  $x$  (see (19a)). Then after various restrictions are added, maximality  
213 operator  $\mathbf{M}_u$  and the test of  $\mathbf{Mary}_u$  are applied at the sentential level, as de-  
214 layed, post-suppositional tests (see (19b)).

215 Similar to (17),  $\mathbf{M}_u$  picks out the maximal dref  $x$  such that (each atomic  
216 part of)  $x$  read *Batman* and *Sandman* (for simplicity, cumulative closure is  
217 assumed). The test  $\mathbf{Mary}_u$  (see (20)) works just like a cardinality test (see  
218 (18)), checking whether the maximal  $x$  assigned to  $u$  is equivalent to *Mary*.

219 (19) **A post-suppositional view on focus** The analysis of (6)

220  $[\mathbf{Mary}]_F^u$ -man Batman-kwa Sandman'-ul ilk-ess-ta  
Mary-ONLY Batman-and Sandman-ACC read-PAST-DECL

221 Under Scenario 2 (see (8)): ‘Only Mary read *Batman* and *Sandman*.’

222 a. **Introducing drefs:**

223  $p = \llbracket \text{some}^u \text{ people read Batman and Sandman} \nu \rrbracket$   
224  $= \lambda g. \left\{ g^{u \mapsto x} \mid y = \text{BM} \oplus \text{SM}, \text{HUMAN}(x), \text{READ}(x, y) \right\}$

225 b. **Checking maximality and cardinality as post-suppositions:**

226  $\llbracket (6) \rrbracket = \llbracket \text{only Mary}^u \text{ read Batman and Sandman} \nu \rrbracket$   
227  $= \mathbf{M}_u(p)$ , if  $x = \text{Mary}$   
228  $= \lambda g. \left\{ g^{u \mapsto x} \mid \begin{array}{l} y = \text{BM} \oplus \text{SM} \\ x = \sigma x. [\text{HUMAN}(x) \wedge \text{READ}(x, y)] \end{array} \right\}$ ,  
229 if  $x = \text{Mary}$

230 (20) The test of  $\mathbf{Mary}_u$ :  $\mathbf{Mary}_u \stackrel{\text{def}}{=} \lambda m. \lambda g. m(g)$ , if  $g(u) = \mathbf{Mary}$

231 *Wh*-expressions are similar to indefinites in introducing drefs and support  
232 cross-sentential anaphora (see (21); see also e.g., Comorovski 1996).

233 (21) Who <sup>$u$</sup>  kissed me? I want to know her <sub>$u$</sub>  name.

234 According to Dayal (1996)’s Maximal Informativity Presupposition, a *wh*-  
235 question presupposes the existence of a maximally informative true answer.<sup>4</sup>

<sup>4</sup>Also, according to Karttunen (1977), a *wh*-question denotes the set of its **true propositional answers**. In TBA, I show that the current post-suppositional perspective on *wh*-questions is also in the same spirit as Karttunen (1977).



236 Thus, when the above two ideas are combined, the semantic contribution  
 237 of *wh*-items should also be two-fold. As shown in (22), a *wh*-item first intro-  
 238 duces a (potentially plural) dref, *y* (see (22a)). Then after various restrictions  
 239 are added, maximality operator  $\mathbf{M}_\nu$  should be applicable (see (22b)). The  
 240 maximal dref *y* (which is picked out via the application of  $\mathbf{M}_\nu$ ) actually con-  
 241 stitutes the (analytically) maximally informative true answer.<sup>5</sup>

242 (22) **A post-suppositional view on *wh*-items**      The analysis of (1)

243 Mary<sup>u</sup>-nun mwusun<sup>ν</sup> chayk-ul ilk-ess-ni?  
 Mary-TOPIC what      book-ACC read-PAST-Q

244 ‘What book(s) did Mary read?’

- 245 a. **Introducing drefs:**  $p = \llbracket \text{Mary}^u \text{ read some}^\nu \text{ books} \rrbracket$   
 246  $= \lambda g. \left\{ g^{u \mapsto x} \mid \text{BOOK}(y), x = \text{MARY}, \text{READ}(x, y) \right\}$   
 247 b. **Applying  $\mathbf{M}_\nu$  as a post-suppositional test:**  
 248  $\llbracket (1) \rrbracket = \llbracket \text{Mary}^u \text{ read what}^\nu \text{ books} \rrbracket = \mathbf{M}_\nu(p)$   
 249  $= \lambda g. \left\{ g^{u \mapsto x} \mid \begin{array}{l} y = \sigma y. [\text{BOOK}(y) \wedge \text{READ}(x, y)] \\ x = \text{MARY} \end{array} \right\}$

250 Overall, I have shown that focus items and *wh*-items (i) introduce drefs and  
 251 (ii) impose definiteness at the sentential-level, in a delayed, post-suppositional  
 252 way. As a consequence, their interpretation is relativized, in the sense that the  
 253 introduced drefs are restricted by information from the rest of a sentence,  
 254 beyond the DP-level of focus items and *wh*-items themselves.

### 255 3.2 Accounting for focus intervention effects

256 Now I show that when both focus items and *wh*-items appear in the same  
 257 sentence, their relativized interpretation is impossible.

258 (23) **Interpreting the pattern ‘only ... *wh*’**      The analysis of (3a)

259 \* [Mary]<sub>F</sub><sup>u</sup>-man mwusun<sup>ν</sup> chayk-ul ilk-ess-ni?  
 Mary-ONLY what      book-ACC read-PAST-Q

260 Intended: ‘What is the book-sum *x* s.t. only Mary read *x*?’

- 261 a. **Introducing drefs:**  $p = \llbracket \text{some}^u \text{ people read some}^\nu \text{ books} \rrbracket$   
 262  $= \lambda g. \left\{ g^{u \mapsto x} \mid \text{BOOK}(y), \text{HUMAN}(x), \text{READ}(x, y) \right\}$   
 263 b. **Applying post-suppositional tests:**  
 264 (i) First  $\mathbf{M}_u \circ \text{Mary}_u$ , then  $\mathbf{M}_\nu$   
 265  $\rightsquigarrow$  Is Mary the only reader? What does she read?

<sup>5</sup> Here I still adopt the mereology-based definition of maximality operator (see (17)). See TBA for a more general, informativeness-based definition.

- 266 (ii) First  $\mathbf{M}_\nu$ , then  $\mathbf{M}_u \circ \mathbf{Mary}_u$   
 267  $\rightsquigarrow$  What are all the books read by someone? Is Mary the  
 268 only one who read them?

269 As shown in (23), focus item *only Mary* and the *wh*-item each introduce a  
 270 dref,  $x$  and  $y$ , and various restrictions are added onto them (see (23a)).

271 Now the post-suppositional tests brought by the focus item (i.e.,  $\mathbf{M}_u \circ$   
 272  $\mathbf{Mary}_u$ ) and the *wh*-item (i.e.,  $\mathbf{M}_\nu$ ) need to be applied.

273 As shown in (23b-i), suppose that  $\mathbf{M}_u \circ \mathbf{Mary}_u$  is applied first, checking  
 274 whether Mary is the unique reader. If the derivation passes the test  $\mathbf{Mary}_u$ ,  
 275  $\mathbf{M}_\nu$  is further applied, picking out all the books this unique reader, Mary, read.

276 Then as shown in (23b-ii), suppose that  $\mathbf{M}_\nu$  is applied first, picking out all  
 277 the books read by someone. Then  $\mathbf{M}_u \circ \mathbf{Mary}_u$  is further applied, checking  
 278 whether Mary is the unique reader that read all these books.

279 No matter whether the derivational order in (23b-i) or (23b-ii) was adopted,  
 280 *only Mary* cannot have a relativized interpretation such that the uniqueness of  
 281 Mary depends on a particular book-sum. Actually the derivations in (23b-i)  
 282 and (23b-ii) would yield the same results:  $\nu$  is assigned to the sum of all  
 283 the books read by someone, and  $u$  is assigned to the sum of all the readers.  
 284 Thus the *wh*-questions (3a)/(4a)/(23) amount to request information on ‘what  
 285 books are read’ or ‘what books the only reader, Mary, read’. No relativized  
 286 interpretation of *only Mary* can be derived, and the use of *only* is trivial.

287 The current analysis explains the lack of relativized interpretation of *only*  
 288 in a *wh*-question and captures our intuition.

289 Intuitively, without knowing what books Mary read, we would not use the  
 290 word *only (Mary)* to address her uniqueness immediately. Instead, we would  
 291 first raise the question ‘what books did Mary read’. Then if we do know what  
 292 books Mary read and are interested in whether she is unique in reading these  
 293 books, we would not need to raise a *wh*-question to request information on  
 294 these books, because we already know the answer.

295 The lack of relativized interpretation of *only* in a *wh*-question can also be  
 296 considered an order conflict. Essentially, the relativized definiteness/maximality  
 297 of the drefs  $x$  and  $y$  relies on adding more restrictions, i.e., applying post-  
 298 suppositional tests in a delayed way, when more information about drefs are  
 299 given (see also the analyses of superlatives in (13)). Therefore, without the  
 300 information on  $x$ , the relativization of the definiteness of  $y$  is impossible, and  
 301 vice versa. In other words, the post-suppositions with regard to drefs  $x$  and  $y$   
 302 compete to be applied as late as possible, after the information of the other is  
 303 given, thus resulting in the failure of the relativization of both.

### 304 3.3 Accounting for the acceptable pattern ‘*wh ... only*’

305 Now I come to explain why the pattern (5b), ‘*wh ... only*’, is acceptable.

306 As already shown in Section 2, the interpretation(s) of the acceptable *wh*-  
 307 question ‘*wh ... only*’ does not fully match the interpretation(s) of the corre-  
 308 sponding declarative sentences with *only*. The acceptable *wh*-question ‘*wh*  
 309 ... *only*’ has only a DP-level, absolute interpretation for the focus item.

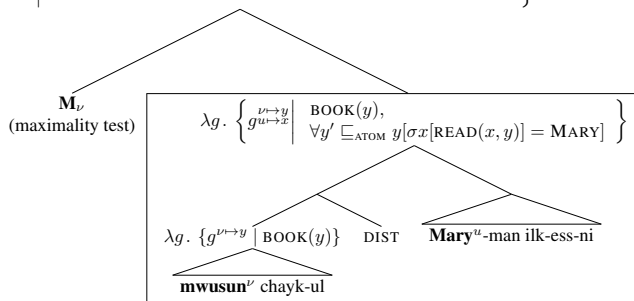
310 For ‘*wh ... only*’, to derive the reading with this absolute interpretation  
 311 of the focus item, I propose that the fronted *wh*-item serves as the sorting  
 312 key, and there is a **covert distributivity operator**, DIST, associated with this  
 313 sorting key. As shown in (24), *only Mary* is interpreted locally, within the  
 314 scope of the universal quantifier of DIST (see the highest node within the  
 315 square frame). Eventually the application of  $M_\nu$  picks out the maximal dref  
 316  $y$  satisfying the restrictions  $\text{BOOK}(y)$  and  $\forall y' \sqsubseteq_{\text{ATOM}} y [\sigma x[\text{READ}(x, y)] =$   
 317  $\text{MARY}]$ , and the *wh*-question means the sum of all the books such that Mary  
 318 is the unique reader for each atomic part of these books.

319 (24) **Interpreting the pattern ‘*wh ... only*’** The analysis of (3b)

320 mwusun<sup>ν</sup> chayk-ul DIST [Mary]<sub>F</sub><sup>u</sup>-man ilk-ess-ni?  
 321 what book-ACC DIST Mary-ONLY read-PAST-Q

321 ‘What book(s) did only Mary read?’

322  $\lambda g. \left\{ \begin{array}{l} \nu \rightarrow y \\ g^{u \rightarrow x} \end{array} \middle| y = \sigma y. [\text{BOOK}(y) \wedge \forall y' \sqsubseteq_{\text{ATOM}} y [\sigma x[\text{READ}(x, y)] = \text{MARY}]] \right\}$



323 (25)  $\llbracket \text{DIST} \rrbracket \stackrel{\text{def}}{=} \lambda X_e. \lambda P_{\langle et \rangle}. \forall x \sqsubseteq_{\text{ATOM}} X [P(x)]$   
 324 (i.e., for each atomic part  $x$  in the potentially plural entity  $X$ ,  $P$  holds  
 325 true for  $x$ .)

326 One more question needs to be answered: If, for the good pattern ‘*wh*  
 327 ... *only*’, there can be a covert distributivity operator associated with the *wh*-  
 328 item, then why cannot there be one associated with the *wh*-item for the pattern  
 329 ‘*only ... wh*’? Here I propose to follow an existing observation in the litera-  
 330 ture: ‘plurals do not readily take “inverse distributive scope” (see Szabolcsi  
 331 2010: Section 8.2 and references therein).’ The explanation of this observa-  
 332 tion is too complicated to be addressed here, and it is not directly relevant to

333 the current goal. As pointed out by Szabolcsi (2010), ‘It should be noted im-  
 334 mediately that there is no logical necessity in this’, so it’s likely due to some  
 335 processing-related factors (see also Szabolcsi 2010 for more discussion).

336 To sum up, when a focus item and a *wh*-item appear together, as summa-  
 337 rized in (26), a sentence-level, relative interpretation for *only* is never pos-  
 338 sible (see (26a-i) and (26b-i)), while a DP-level, strong interpretation for  
 339 *only* hinges on the availability of a cover distributivity operator and thus *wh*-  
 340 movement. Therefore, the pattern ‘*only* . . . *wh*’ has no possible interpretation,  
 341 making this pattern degraded, while the pattern ‘*wh* . . . *only*’ is acceptable due  
 342 to the availability of one interpretation (see (26b-ii)).

- 343 (26) Accounting for focus intervention effects (see (5))
- 344 a. Degraded pattern: *only* . . . *wh*
    - 345 (i) ✗ a sentence-level, relative interpretation for *only*
    - 346 (ii) ✗ a DP-level, absolute interpretation for *only*
  - 347 b. Acceptable pattern: *wh* . . . *only*
    - 348 (i) ✗ a sentence-level, relative interpretation for *only*
    - 349 (ii) ✓ a DP-level, absolute interpretation for *only*

#### 350 4 Discussion: Derivational crash vs. interpretation difficulty

351 Existing studies on intervention effects do not always share the same empiri-  
 352 cal coverage, but degradedness is often considered due to derivational crash.

353 For example, Beck (2006)’s account for the degraded configuration (27) is  
 354 based on Rooth (1985)’s focus semantics. A *wh*-item has its focus semantic  
 355 value (i.e., a set of alternatives), but lacks an ordinary semantic value. Thus a  
 356 Q operator is needed to take this focus semantic value and output an ordinary  
 357 semantic value. However, for (27), (i) the focus-sensitive operator (e.g., *only*)  
 358 blocks the association between the *wh*-item and the Q operator, and (ii) the  
 359 focus-sensitive operator itself requires to be applied to an expression that has  
 360 both a focus semantic value and an ordinary value. For these two reasons, the  
 361 derivation crashes.

- 362 (27) Degraded configuration analyzed in Beck (2006):  
 363 ?\* [*Q*...[focus-sensitive operator [<sub>YP</sub>... WH...]]]

364 According to Li and Law (2016), as shown in (28), both  $XP_F$  and WH  
 365 introduce alternatives, thus [[  $XP_F$ ...WH...]] is a set of sets of alternatives.  
 366 As a consequence, there is type mismatch for the application of the focus-  
 367 sensitive operator, and the derivation crashes.

- 368 (28) Degraded configuration analyzed in Li and Law (2016):  
 369 ?\* [...focus-sensitive operator [  $XP_F$ ...WH...]]

370 Compared with these derivation-crash-based studies, the current account  
 371 has at least three empirical advantages.

372 First, by attributing degradedness to interpretation difficulty or meaning  
 373 triviality rather than derivational crash, the current account is better in line  
 374 with the observation of Tomioka (2007): there is often variation among speak-  
 375 ers’ judgments for this kind of data. In particular, as mentioned above, the  
 376 availability of a covert distributivity operator for a sentence-initial *wh*-item,  
 377 but not for a sentence-middle *wh*-item, might be related to processing load.

378 Second, under the current account, the acceptable pattern ‘*wh ... only*’ is  
 379 not really based on its structure, but rather the availability of an interpretation  
 380 (i.e., the DP-level, absolute interpretation for *only*). More specifically, I point  
 381 out that the acceptability of the pattern ‘*wh ... only*’ hinges on the sorting-  
 382 key-status of the *wh*-item, which in turn hinges on *wh*-movement. Thus the  
 383 current account predicts that for *wh*-items that cannot serve as a sorting key,  
 384 the pattern ‘*wh ... only*’ should be degraded as well.

385 This prediction is borne out. As illustrated in (29), (29a) is a good declar-  
 386 ative sentence with *only*. However, if we raise a *wh*-question about the height  
 387 information of Mary, the corresponding *wh*-question is degraded (see (29b)).

- 388 (29) a. Only Mary<sub>F</sub> is above 6 feet tall.  
 389 b. \*How<sup>I</sup> tall is only Mary? *wh ... only*

390 Given that (29b) involves *wh*-movement and has the pattern ‘*wh ... only*’,  
 391 Beck (2006) and Li and Law (2016) would still predict it to be acceptable,  
 392 which is contrary to native speakers’ intuitive judgments.

393 Under the current account, since (29b) is a degree question, the *wh*-item  
 394 here, *how tall*, does not introduce a dref in the domain of (potentially plural)  
 395 individuals or entities, but rather in the domain of scalar values (i.e., degrees  
 396 or intervals, see Zhang 2020, 2022). As shown in the definition of DIST in  
 397 (25), a scalar value cannot be the first argument of DIST, i.e., covert distribu-  
 398 tivity cannot be at play here. Thus the reading with the absolute interpretation  
 399 of *only Mary* cannot be derived. As a consequence, (29b) has no reading, and  
 400 its degradedness is naturally explained.

401 Third, the current account also predicts that as far as the issue of rela-  
 402 tivated maximality/definiteness requirements can be resolved and the use of  
 403 *only* is not trivial, the pattern ‘*only ... wh*’ should be acceptable as well. This  
 404 prediction is also borne out, as evidenced by the contrast in (30).

- 405 (30) ‘*only ... wh*’ in Chinese: *wh*-question vs. *wh*-conditional  
 406 a. \* zhǐ-yǒu Mary<sub>F</sub> dú-le shénme shū?  
     only Mary read-PFV what book  
 407 ‘What is the book-sum *x* s.t. only Mary read *x*?’ (= (4a))

- 408           b. Context: Mary and I have special taste in books. Only Mary is  
 409 interested in the books I read and follows me to read them.  
 410 wǒ dú shénme shū, zhǐyǒu Mary<sub>F</sub> (yě) gen-zhe wǒ dú  
 I read what book only Mary (also) follow I read  
 411 shénme shū  
 what books  
 412 ‘Only Mary follows me to read whatever books I read.’

413 In (30), both the *wh*-question (30a) and the *wh*-conditional (30b) contain  
 414 the pattern ‘only . . . *wh*’. The *wh*-question (30a) has no felicitous reading  
 415 and is thus degraded. However, the *wh*-conditional (30b) is intuitively good.  
 416 Those accounts that attribute the degradedness of ‘only . . . *wh*’ to derivational  
 417 crash would wrongly predict ungrammaticality for both (30a) and (30b).

418 For a *wh*-conditional like (30b), the answer to its first part (‘what books  
 419 I read’) and the answer to its second part (‘what is the book-sum *X* such  
 420 that only Mary follows me to read *X*’) are equivalent. Thus, the relativized  
 421 definiteness of the *wh*-item in the second part can be resolved by the answer  
 422 to the first part and independent of the focus item in the second part. Thus the  
 423 order conflict in applying post-suppositional tests brought by the *wh*-item and  
 424 the focus item can be circumvented. We first use the answer to ‘what books I  
 425 read’ to resolve the deterministic update of the *wh*-item in the second part of  
 426 the *wh*-conditional, and then the post-suppositional test of the focus item is  
 427 applied as the last step, checking the relative uniqueness of Mary.

## 428 5 Conclusion

429 (Focus) intervention effects have been a hot topic in formal linguistics for  
 430 decades. In this paper, I propose that both focus items and *wh*-items work in a  
 431 way similar to definite determiner *the* and modified numerals. Specifically, all  
 432 these items (i) first introduce drefs and (ii) then bring post-suppositions, i.e.,  
 433 relativized maximality/definiteness tests that need to be checked in a delayed  
 434 way, at the sentential level. As a consequence, when focus items and *wh*-  
 435 items appear together, relativized maximality/definiteness cannot be satisfied,  
 436 resulting in meaning triviality for focus items. In contrast to the degraded pat-  
 437 tern ‘only . . . *wh*’, which has no felicitous interpretation at all, the acceptable  
 438 pattern ‘*wh* . . . only’ is still left with an absolute interpretation for the focus  
 439 item, due to *wh*-movement and the sorting-key-status of the *wh*-item.

440 Compared to existing accounts, the current analysis is empirically more  
 441 advantageous. For future research, I will extend the current account to explain  
 442 (i) quantificational intervention effects (see e.g., Beck 1996) and (ii) weak  
 443 island effects (see Abrusán 2014; Zhang 2022 for discussions on the potential  
 444 connection between intervention effects and weak island effects).

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