Disambiguation Strategies in Across-the-Board Wh-Questions

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0. Ambiguity of ATB Wh-Questions

Across-the-board wh-questions are considered to be ambiguous between so-called single individual and pair list readings. The two readings are best distinguished by the types of answers such questions allow. For example, (1a) can either be a question about a single quantity of books, or about two distinct quantities, as shown by the availability of the answers in (1b) and (1c).¹

- (1) a. *How many books_i* did John like *t_i* and Mary dislike *t_i*?
 b. Seven.
 c. John liked 5 books and Mary disliked 8 books.

On the copy theory of movement of Chomsky (1995), which treats movement as a sequence of three operations (*Copy*, *Merge*, and *Delete*), the availability of these two interpretations can be reduced to the issue of which copy (or copies) are deleted at LF. The two possible derivations of (1a), corresponding to the two interpretations, are schematized in (2a-c) and (3a-c), respectively. Both involve deletion of the lower two copies at PF, illustrated in (2b) and (3b). The two differ, however, with respect to which copies delete at LF. If the two lower copies delete, the result is a single individual reading, given in (2c), in which the fronted wh-phrase has wide scope with respect to the conjunction. If the higher copy deletes,

¹ There is a preference for single individual readings, which has to do with the blocking effect induced by the availability of CP coordination alternative, given in (i), which is unambiguously interpreted as pair list.

(i) *How many books_i* did John like *t_i* and *how many books_j* did Mary dislike *t_j*?

The availability of pair list readings in ATB questions becomes more apparent in examples of the following sort:

(ii) *Which of his victims_i* did Bill kill *t_i* on Tuesday and Fred kill *t_i* on Wednesday?

(iii) Bill killed his first victim and Fred killed his second.

(iv) Bill killed Bruno and Fred killed Arno.

(Munn 1999:422)

the result is a pair list reading, given in (3c), in which the *wh*-phrase has narrow scope with respect to the conjunction.

- (2) a. Copy and Merge *how many books* in [Spec,CP]:
 [_{CP} *How many books* did [_{&P} [_{TP} John like *how many books*] and
 [_{TP} Mary dislike *how many books?*]]]]
 b. Delete lower copies at PF:
 [_{CP} *How many books* did [_{&P} [_{TP} John like ~~*how many books*~~] and
 [_{TP} Mary dislike ~~*how many books?*~~]]]]
 c. Delete lower copies at LF:
 [_{CP} *How many books* did [_{&P} [_{TP} John like ~~*how many books*~~] and
 [_{TP} Mary dislike ~~*how many books?*~~]]]] (*single individual reading*)
- (3) a. Copy and Merge *how many books* in [Spec,CP]:
 [_{CP} *How many books* did [_{&P} [_{TP} John like *how many books*] and
 [_{TP} Mary dislike *how many books?*]]]]
 b. Delete lower copies at PF:
 [_{CP} *How many books* did [_{&P} [_{TP} John like ~~*how many books*~~] and
 [_{TP} Mary dislike ~~*how many books?*~~]]]]
 c. Delete upper copy at LF:
 [_{CP} ~~*How many books*~~ did [_{&P} [_{TP} John like *how many books*] and
 [_{TP} Mary dislike *how many books?*]]]] (*pair list reading*)

This is by no means the only way to account for the ambiguity of ATB questions. However, since my main focus in this paper is not on what allows both readings, but on what factors disambiguate toward one reading over the other, I will refrain from comparing the copy deletion based account schematized here to more semantic alternatives, such as Munn's (1999) account, which assimilates pair list readings to functional readings, or Gawron and Kehler's (2003) account, which derives pair list readings from the presence of an implicit *RESP* operator, thus assimilating them to coordinate structures containing the adverb *respectively*.

Instead, I will examine two factors that disambiguate toward either a single individual or a pair list interpretation of ATB questions. One involves the choice of the coordination strategy, and the other one left branch extraction. I will focus on Polish, a West Slavic language, which differs from English in three relevant respects. First, unlike English, it allows the correlative coordination *both ... and* with clausal conjuncts:^{2 3}

² Polish is not unique in this respect. Johannessen (2005) shows that Norwegian, Icelandic, Greek, and Dutch behave similarly.

³ All correlative coordination strategies in Polish involve repetition of the relevant conjunction:

(i) *i Jan i Maria*
 and Jan and Maria
 'both Jan and Maria'

- (4) a. * *Both* John laughs *and* Mary smiles. (Larson 1985:237)
 b. I Jan się śmieje i Maria się śmieje.
 and Jan REFL laughs and Maria REFL laughs
 ‘Jan laughs and Maria laughs’

Second, unlike English, Polish allows left branch extraction:

- (5) a. * *How many*_i did you read *t_i* books?
 b. *Ile*_i książek *t_i* przeczytałaś?
 how-many books read.2sg
 ‘How many books have you read?’

And third, Polish has an ‘extra’ conjunction marker, the so-called contrastive conjunction, which creates extra interpretive possibilities in ATB questions. The conjunction in question is *a*, glossed as *and_C*, which is distinguished from the consecutive conjunction *i*, which marks temporal sequence. English uses the same conjunction to express both contrast and temporal sequence, which has been shown by Malchukov (2004) to be quite common from a typological perspective.⁴

- (6) a. Poszedł do sklepu *i/ *a* kupił chleb.
 went to store and *and_C* bought bread
 ‘He went to the store and bought some bread.’
 b. Jan poszedł do sklepu *a/ *i* Maria pojechała do kina.
 Jan went to store *and_C/and* Maria went to cinema
 ‘Jan went to the store and Maria to the movies.’

The contrastive nature of the Polish conjunction *a* is further shown by the fact that it is required in cases of coordinate ellipsis, such as gapping or right node raising.⁵

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- (ii) *albo* Jan *albo* Maria
 or Jan or Maria
 ‘either Jan or Maria’
 (iii) *ani* Jan *ani* Maria
 nor Jan nor Maria
 ‘neither Jan nor Maria’

⁴ In cases such as the ones given in (i-ii), in which there is no overtly expressed contrast, there is an implicit one.

- (i) Znikał na całe tygodnie, *a* nawet miesiące.
 disappeared for whole weeks, *and_C* even months
 ‘He would disappear for whole weeks, and even months.’

(The IPI PAN Corpus of Polish)

- (ii) Słoń *a* sprawa polska
 elephant *and_C* question Poland
 ‘The elephant and the Polish issue’

(Robert Rothstein, p.c.)

Frajzyngier (1985) shows that it can also be used as a switch reference marker.

⁵ Ellipsis is well-known to require its remnants to be contrastively focused (see Hankamer 1971, Jackendoff 1971 for early observations of this requirement).

- (7) a. Maria czyta książki *a/ *i* Ania opowiadania.
 Maria reads books and_c and Ania stories
 ‘Maria reads books and Ania stories.’
 b. Jan przeczytał *a/ *i* Maria zrecenzjonowała ten artykuł.
 Jan read and_c and Maria reviewed this article
 ‘Jan read and Maria read this article.’

In the remainder of this paper, I turn to the issue of how the choice of coordination strategy and left branch extraction affect the interpretation of ATB questions. I will proceed as follows. In Sections 1 and 2, I will show that correlative coordination disambiguates toward a single individual reading and left branch extraction disambiguates toward a pair list reading. And in Section 3, I will propose an account which derives these two generalizations from two independent factors: the status of the correlative *both* as a focus particle, and the fact that focus particles cause intervention effects.

1. Conjunction Strategies in Polish ATB Questions

All three conjunction strategies discussed in the previous section, namely consecutive, contrastive, and correlative conjunctions, are allowed in Polish ATB questions. However, they result in different interpretations. Questions with consecutive and correlative conjunctions are disambiguated toward a single individual reading, as shown in (8) and (9), whereas questions with a contrastive conjunction allow both readings, as shown in (10).

- (8) a. *Ile artykułów_i i* Maria napisała *t_i i* Ania
 how-many articles and Maria wrote and Ania
 przeczytała *t_i*?
 read
 ‘How many articles did Maria write and Ania read?’
 b. Pięć.
 five
 c. # Maria napisała 5 artykułów *i* Ania przeczytała 9 artykułów.
 Maria wrote 5 articles and Ania read 9 articles
 ‘Maria wrote 5 articles and Ania read 9 articles.’
- (9) a. *Ile artykułów_i* Maria napisała *t_i i* Ania przeczytała *t_i*?
 how-many articles Maria wrote and Ania read
 ‘How many articles did Maria write and Ania read?’
 b. Pięć.
 five
 c. # Maria napisała 5 artykułów *i* Ania przeczytała 9 artykułów.
 Maria wrote 5 articles and Ania read 9 articles
 ‘Maria wrote 5 articles and Ania read 9 articles.’

- (10) a. *Ile artykułów_i Maria napisała t_i a Ania przeczytała t_i?*
 how-many articles Maria wrote and_C Ania read
 ‘How many articles did Maria write and Ania read?’
 b. *Pięć.*
 five
 c. *Maria napisała 5 artykułów a Ania przeczytała 9 artykułów.*
 Maria wrote 5 articles and_C Ania read 9 articles
 ‘Maria wrote 5 articles and Ania read 9 articles.’

In cases in which only a pair list reading is felicitous, such as the one in (11a-b), only a contrastive conjunction is possible:⁶

- (11) a. *Ile ze swoich ofiar Jan zabił t_i w piątek a/*i Tomek zamordował t_i w sobotę?*
 how-many of REFL victims Jan killed on Friday and_C/and Tom murdered on Saturday
 ‘How many of his victims did Jan kill on Friday and Tom murder on Saturday?’
 b. **Ile ze swoich ofiar i Jan zabił w piątek i Tomek zamordował w sobotę?*
 how-many of REFL victims and Jan killed on Friday and Tom murdered on Saturday

The generalization that emerges from the data discussed in this section is that correlative and consecutive coordination strategy block pair list readings in ATB wh-questions. In the next section, I turn to the effects of left branch extraction on the interpretation of ATB questions.

2. Left Branch Extraction in ATB Wh-Questions

As is well-known since Ross 1967, Slavic languages allow violations of the Left Branch Condition in simple wh-questions. An example from Polish is given in (12a). It contrasts in grammaticality with (12b), which might suggest that left branch extraction is impossible in ATB questions.

- (12) a. *Ile_i Maria napisała t_i artykułów?*
 how-many Maria wrote articles
 ‘How many articles did Maria write?’

⁶ These examples are modeled upon Munn’s (1999) English examples.

- b. **Ile_i* Maria napisała *t_i* artykułów *i* /*a* Ania
 how-many Maria wrote articles and/and_C Ania
 przeczytała *t_i* artykułów?
 read articles
 ‘How many articles did Maria write and Ania read?’

However, this is only apparent. In Citko 2006, I showed that ATB LBE is grammatical as long as the ‘remnants’ inside the second conjunct are distinct from their correspondents inside the first conjunct. (12b) thus becomes grammatical if the stranded nominal inside the second conjunct is replaced with one that is distinct from its correspondent inside the first conjunct.

- (13) *Ile_i* Maria napisała *t_i* artykułów *a* Ania przeczytała *t_i* opowiadań?
 how-many Maria wrote articles and_C Ania read stories
 How many articles did Maria write and how many stories did Ania read?

What is interesting is the fact that left branch extraction in ATB questions is only possible with a contrastive conjunction. This is shown by the contrast between the grammatical example in (13) above, and the ungrammatical ones in (14a-b) below, involving a consecutive and a correlative conjunction, respectively.

- (14) a. **Ile_i* Maria napisała *t_i* artykułów *i* Ania przeczytała *t_i*
 how-many Maria wrote articles and Ania read
 opowiadań?
 stories
 ‘How many articles did Maria write and how many stories did Ania read?’
 b. **Ile_i* *i* Maria napisała *t_i* artykułów *i* Ania
 how-many and Maria wrote articles and Ania
 przeczytała *t_i* opowiadań?
 read stories
 ‘How many articles did Maria write and how many stories did Ania read?’

Furthermore, left branch extraction forces narrow scope interpretation. The only possible answer to the question in (13) above involves two distinct quantities of books.

- (15) a. #Pięć.
 five
 b. Maria napisała 5 artykułów a Ania przeczytała 10 esejów.
 Maria wrote 5 articles and_C Ania read 10 essays
 ‘Maria wrote 5 articles and Ania read 10 essays.’

In this respect, ATB questions with left branch extraction (and a contrastive conjunction) differ from their pied-piped counterparts, which allow both readings (as shown in (10a-c) above). This raises the question of why left branch extraction forces narrow scope interpretation. Two other questions that emerge from the discussion so far are why correlative coordination blocks left branch extraction (as shown in (14b) above), and why correlative coordination blocks narrow scope reading (as shown in (10a-c) above). In what follows, I will show that the answers to these questions are related, and follow from the status of correlative coordination particles, coupled with independent properties of focus particles.

3. Toward an Account

There are two crucial ingredients to my proposal. The first one involves the semantic contribution of the correlative particle *both* (and its Polish counterpart *i* ‘and’). In this respect, I follow Hendriks (2001) and Johannessen (2005), who analyze correlative particles as focus particles. They point to the fact that in English *both* behaves like *only* in (at least) two respects. Both *both* and *only* can be separated from the constituents they are associated with, as shown in (16a-b).

- (16) a. These circumstances proved fortunate *both* for [myself and Augustus]. (Hendriks 2001:4)
b. These circumstances proved fortunate *only* for MYSELF.

Furthermore, both are incompatible with clauses:

- (17) a. * *Both* it rains and it snows.
b. * *Only* it rains.

This prohibition is not universal, as shown by the grammatical status of the Polish counterparts of the English examples in (17a-b).

- (18) a. *I* pada deszcz *i* pada śnieg
and falls rain and falls snow
‘It both rains and snows.’
b. *Tylko* pada deszcz.
only falls rain
‘It only rains.’

The second crucial ingredient in my proposal involves an independent fact that focus particles cause intervention effects (Beck 2006, Kim and Beck 1997, Pesetsky 2000, among others). A typical configuration that gives rise to intervention effects is given schematically in (19a). Typical interveners, which can vary from language to language, are given in (19b). The suggestion I would like to make is that the focus particle *both* also belongs to the class of interveners.

- (19) a. * A Intervener B
 b. only, even, also, not, (almost) every, no, most, few (and other nominal quantifiers), always, often, never (and other adverbial quantifiers), **both**

There are three distinct environments that show intervention effects, depending on the nature of A and B in (19a). The first one involves wh-in-situ languages, in which the intervener blocks the relationship between a wh-pronoun in situ and its licensing complementizer. In the examples that follow, the interveners are in italics, and the elements whose relationship is blocked are in bold.

- (20) C Intervener WH (wh-in-situ)
- a. * *Lili-yum eete* **pustakam**-aane waayikk-ate? [Mal]
 Lili-also which book-be read-NOM
 ‘Which book did Lili, too, read?’
- c. * *Hotondo dono hito-mo nani-o* yonda **no**? [Jap]
 almost every person what-ACC read Q
 ‘What did almost every person read?’
- d. ?**Zhiyou Lili* kan-le **na-ben shu**? [Man]
 only Lili read-asp which-cl book
 ‘Which book did only Lili read?’ (Beck 2006:6)

The second case of intervention involves multiple wh-questions in languages which front only one wh-phrase overtly. Here the intervention effect concerns the relationship between the two wh-phrases.⁷

- (21) WH₁ Intervener WH₂ (multiple wh-questions)
- a. * **Wen** hat *niemand* **wo** gesehen? [Ger]
 whom has nobody where seen
 ‘Where did nobody see whom?’
- b. * **Wie** heeft *niemand* aan **wie** voorgesteld? [Dut]
 who has nobody to who introduced
 ‘Who did nobody introduce to whom?’ (Beck 2006:7)

⁷ The situation is a little more complex in English, which show intervention effects only in D-linked wh-questions violating superiority, as shown by the contrast between (i) and (ii) (from Pesetsky 2000)

(i) Who did *only John* introduce **to whom**?
 (ii) ?? Which boy_i did *only Mary* introduce *which girl* to *t_i*?

And the third one, which is the one that is going to be most relevant for our purposes, involves so-called discontinuous (or split) wh-phrases, in which the relationship between two parts of a single wh-phrase is blocked by an intervening quantificational element.⁸

- (22) WH₁ Intervener WH₁ (discontinuous wh-phrases)
- a. * **Wen_i** hat *keine Studentin* *t_i* **von den Musikern** getroffen?
[Ger]
whom has no student of the musicians met
'Which of the musicians did no student meet?'
- b. # **Koho_i** *málo studentù* vidilo *t_i* **z muzikantù**? [Cze]
whom few students saw from musicians
'Who from the musicians did few students see?'
(Kucerova, in press)

With this background on intervention, we can explain the effects of correlative coordination on the interpretation of ATB wh-questions. The first question I want to address here is why narrow scope reading is blocked by the presence of the correlative marker. The relevant example is repeated below.

- (23) a. *Ile artykułów_i* **i** Maria napisała *t_i* **i** Ania
how-many articles and Maria wrote and Ania
przeczytała *t_i*?
read
'How many articles did both Maria write and Ania read?'
- b. Pięć.
five
- c. # Maria napisała 5 artykułów **i** Ania przeczytała 9 artykułów.
Maria wrote 5 articles and Ania read 9 articles
'Maria wrote 5 articles and Ania read 9 articles.'

The most straightforward syntactic explanation for the availability of narrow scope reading involves *interpretation of the ATB extracted wh-phrase in a reconstructed position*. In the case at hand, however, reconstruction is blocked by the correlative marker. Given the fact that the correlative marker is a focus particle, the lack of narrow scope reading becomes a straightforward case of an interven-

⁸ Corresponding examples in which the nominal is pied-piped are fine:

- (i) **Wen von den Musikern_i** hat *keine Studentin* *t_i* getroffen?
whom of the musicians has no student met
'Which of the musicians did no student meet?' (Beck 1996:3-4)
- (ii) **Koho z muzikantù_i** vidilo *málo studentù* *t_i*?
whom from musicians saw few students
'Who from the musicians did few students see?'

tion effect, a covert counterpart of the overt cases given in (21) above. The correlative marker intervenes between the interrogative complementizer and the reconstructed wh-phrases, as shown in (24a-b).

- (24) a. ~~How many articles~~ did **both** Maria write *how many articles* and
Anna read *how many articles*?
b. C BOTH how many articles

We have also seen above that left branch extraction is blocked by an intervening correlative focus particle, as shown by the ungrammatical status of (25).

- (25) **Ile_i* *i* Maria napisała *t_i* artykułów *i* Ania
 how-many and Maria wrote articles and Ania
 przeczytała *t_i* esejów?
 read essays
 ‘How many articles did Mary write and how many essays did Anna read?’

This also becomes a straightforward case of an intervention effect, parallel to the one illustrated in (22) above. The two parts of a *wh*-phrase (the *how many* question part and its nominal complement) are separated by the focus particle *both*, which is what induces an intervention effect.

- (26) a. *how many* **both** Maria wrote *articles* and Ania read *essays*
 b. *how-many* **BOTH** *articles/essays*

So far I have explained why correlative coordination blocks narrow scope and left branch extraction. These two are obviously related, as they involve the similar (if not identical) configurations at LF. I have not yet explained why consecutive coordination in Polish induces the same intervention effect (as shown by the lack of a pair list reading in (9) above), and why only contrastive coordination allows narrow scope reading. While a complete consideration of these issues goes beyond the scope of this paper, let me in conclusion offer some suggestions. One way of explaining the lack of pair list readings with consecutive coordination would involve a covert focus particle, akin to the overt *both* in correlative coordinate structures.

The correlation between the availability of pair list readings and the use of a contrastive conjunction, on the other hand, can be attributed to the lexical properties of the contrastive conjunction. It requires contrast between the two conjuncts. A pair list reading, which results in two distinct answers, is one way of satisfying this requirement. Alternatively, it can be satisfied by focusing the verbs or the subjects, which makes a single individual reading possible. These two possibilities are illustrated in (27-28).

- (27) a. *Ile artykułów_i Maria napisała t_i a Ania*
how-many articles Maria wrote and_C Ania
przeczytała t_i?
read
‘How many articles did Maria write and Ania read?’
b. Maria napisała 5 artykułów i Ania przeczytała 9 artykułów.
Maria wrote 5 articles and Ania read 9 articles
‘Maria wrote 5 articles and Ania read 9 articles.’
- (28) a. *Ile artykułów_i Maria NAPISAŁA t_i a Ania*
how-many articles Maria wrote and_C Ania
PRZECZYTAŁA t_i?
read
‘How many articles did Maria WRITE and Ania READ?’
b. Pieć.
five

4. Conclusion

To conclude briefly, I have examined in this paper two factors that affect the interpretation of ATB questions. One was the choice of a coordination strategy (consecutive, contrastive, or correlative), and the other one was left branch extraction. I have shown that correlative coordination forces wide scope reading and blocks left branch extraction. I have argued that this effect of correlative coordination can be attributed to the status of the correlative *both* as a focus particle, combined with an independent observation that focus particles cause intervention effects. Consequently, I have shown that the incompatibility of pair list readings and left branch extraction with correlative coordination is yet another instance of an intervention effect.

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