Coordinated *wh*-questions in English: An HPSG Approach

Youn-Gyu Park and Jong-Bok Kim (KYUNG HEE UNIVERSITY)

youngyu0406@khu.ac.kr   jongbok@khu.ac.kr

1   Introduction

English allows not only multiple *wh*-questions (Multi-WhQ) but also the coordinated *wh*-questions (Coord-WhQ) with conjoined *wh*-phrases in the clausal initial position (Citko 2013: 6).

(1)   a.   *Why* did you see Kim *when*?

       b.   *When* and *why* did you see Kim?

One intriguing property of Coord-WhQs is that they behave quite differently from Multi-WhQs in several aspects. For instance, English does not allow multiple *wh*-fronting, but this can be saved in Coord-WhQs:

(2)   a.   *When where did you see John?

       b.   *What when did John eat? (Citko and Gračanin-Yüksek 2020: 1)

(3)   a.   What and where did you see John?

       b.   What and when did John eat? (Potter and Frazier 2021: 2)

There have been two main directions for the analysis of Coord-WhQs: mono-clausal and bi-clausal analyses (e.g., Gribanova 2009; Bîlbîie and Gazdik 2012; Citko and Gračanin-Yüksek 2013). The former takes *wh*-phrases to form a coordination structure either from a movement or a base-generation. In the meantime, the latter diverges into two sub-strands: bulk-sharing and non-bulk sharing. The bi-clausal bulk-sharing analyses posit two underlying clauses with a mono-clause shared by both the clauses as a bulk, while the bi-clausal non-bulk sharing ones allow one or more constituents to be selectively shared by the assumed clauses.

In order to look into their authentic uses of Coord-WhQs in real-life and check the feasibility of the previous analyses, we have first performed a corpus investigation. We then briefly discuss the theoretical implications that our dataset displays. Finally, we propose a non-derivational analysis that allows Coord-WhQs to have a mono-clause structure involving a conjoined *wh*-expression phrases in a given context. In addition, we propose in certain cases, the first *wh*-phrase might not of its *at-issue* reading; instead it queries additional predicative information regarding coreferring expression.

2   Key properties

Wh-questions display the filler-gap dependency (among others, Pollard and Sag 1994). As coindexed in (4), a syntactic 'gap' in the subject position of the verb *visit* is filled by a 'filler', the *wh*-phrase *who*.

(4) Who_i _____ $_i$ visits Merle? (Ginzburg and Sag 2000: 237)

Likewise, Coord-WhQs displays the filler-gap dependency as well, but they can take one or more filler-gap dependency relations.

(5)   a.   [How many sheets]$_i$ and [how many towels]$_i$ do we need to take _____ $_i$?

       b. $When_i$ and $where_i$ did you see her _____ $_i$? (Huddleston and Pullum 2002: 874)

In (5a), the verb *take* posits a syntactic gap in its (internal) argument position and it seems that both the *wh*-phrases *how many sheets* and *how many towels* can successfully serve as a corresponding filler. In the same manner, the syntactic gap licensed by the verb *see* in (5b) takes a gap in its modifier position, and it can be filled by the *wh*-pair *when* and *where*. It seems that, at first glance, the reason they can fill the same syntactic gap is because they share an identical grammatical function. Thus things are quite different in cases where the two *wh*-phrases do not match in terms of their grammatical functions.

(6) $What_i$ and $when_j$ did John *eat* _____ $_i$ _____ $_j$? (Citko and Gračanin-Yüksek 2020: 4)

As given, the first *wh*-phrase *what* serves as a putative argument of the verb *eat* whereas the second one *when* as a potential modifier. Then, we can assume that the coordinated *wh*-phrases can share their gaps only if their grammatical functions match.

Semantically, Coord-WhQs behave differently from Multi-WhQs. To begin with, Multi-WhQs induce the *pair-list* reading. In this regard, an answer to a Multi-WhQ can be polyadic so a pair of possible answers can be enumerated as given below (Ginzburg and Sag 2000; Huddleston and Pullum 2002).

(7)   Q: *Who* admires *whom* in this department?

A: Millie admires Brendan, Sigmund admires Carl, . . . (Ginzburg and Sag 2000: 143)

POSSIBLE ANSWERS: {<caller$_1$: recipient$_1$>, <caller$_2$: recipient$_2$>, ...}

On the other hand, Coord-WhQs usually license the *single-pair* reading (Ginzburg and Sag 2000; Bîlbîie and Gazdik 2012; Citko and Gračanin-Yüksek 2013).

(8)   Q: *When$_i$* and *where$_j$* were the children examined?

      A: On Monday$_i$ in the school$_j$. (Bîlbîie and Gazdik 2012: 21)

        POSSIBLE ANSWERS: {<temporal$_1$: place$_1$>, #<temporal$_2$: place$_2$>, ...}

As given, the enumeration of more than one possible answer pair to Coord-WhQs would be infelicitous.

3   Previous analyses

Previous analyses have suggested that Coord-WhQs are derived from either a mono- or bi-clausal source, with certain kinds of derivational operation (Gribanova 2009; Citko and Gračanin-Yüksek 2013, 2020).

The mono-clause analysis assumes that a Coord-WhQ is derived from a mono-clausal source, where *wh*-words undergo the SIDEWARD movement (Gribanova 2009). The analysis claims that the rightmost *wh*-word undergoes the SIDEWARD movement first, leading it to land on the left peripheral position of a remaining clause (Citko and Gračanin-Yüksek 2013: 13).

(9)   *What and where* did you eat?

     a.   You ate **WHAT WHERE**   ⟨SORUCE STRUCTURE⟩

     b.   [$_{\&'}$ and *where$_i$*] [you ate **WHAT** _____ $_i$]   ⟨'*and*' + SIDEWARD MOVEMENT of '*where*'⟩

     c.   [$_{\&P}$ *what$_j$* and *where$_i$*] [you ate] _____ $_j$ _____ $_i$ ⟨SIDEWARD MOVEMENT of '*when*'⟩

     d.   [$_{CP}$ [$_{\&P}$ *What* and *where*] [$_{IP}$ did you eat]]?   ⟨&P merges with the rest IP⟩

The mono-clausal analysis, then, has to do with the superiority effect (cf. Chomsky 1973). That is, it fails to derive the 'MOD(ifier)-SUBJ(ect)' or 'MOD/ARG(ument)' *wh*-pair orderings, as given below (Citko and Gračanin-Yüksek 2013; 2020):

(10)   *Where and what* did you eat? (adapted from (9))

     a.   *You ate **WHERE$_i$ WHAT$_j$**   ⟨SORUCE STRUCTURE⟩

     b.   [$_{CP}$ [$_{\&P}$ *where$_j$* and *what$_i$*] [$_{IP}$ did you eat _____ $_i$ _____ $_j$]]?

On the other hand, there are two possible approaches assumed by the bi-clausal analyses. **The bi-clause bulk sharing analysis** asserts that the two CPs share the lower TP as a whole. That is, the lower TP is shared as a bulk and the *wh*-words are fronted from the mono-clause into two separate SPEC, CP positions of two separate clauses (Gračanin-Yuksek 2013):

(11)   a.   *What* and *why* did you eat?   (Citko and Gračanin-Yüksek 2013: 3, adapted)

     b.   [$_{CP1}$ What$_i$ (did you eat _____ $_i$ _____ $_j$)$_k$] and [$_{CP2}$ why$_j$ [did you eat _____ $_i$ _____ $_j$]$_k$] ?

Meanwhile, **the bi-clause non-bulk sharing analysis** asserts that a Coord-WhQ consists of two different clauses sharing a symmetric syntactic structure. The analysis focuses on the dominance relation between the first CP and its following &' expression (Citko and Gračanin-Yüksek 2013; 2020):

(12)   a.   *What* and *when* did you eat?   (Citko and Gračanin-Yüksek 2020: 4)

     b.   [$_{\&P}$ [$_{CP}$ **What$_i$** (did)$_k$ (you)$_l$ (eat)$_m$ _____ $_i$] [$_{\&'}$ and [$_{CP}$ **when$_j$** did$_k$ you$_l$ eat$_m$ _____ $_j$]]]?

In (12), we can observe the first CP *what$_i$ (did)$_k$ (you)$_l$ (eat)$_m$* dominates the second CP *when$_{i\,j}$ did$_k$ you$_l$ eat$_m$*. The non-*wh*-linguistic units in the first CP *did you eat* are not pronounced while those in the second CP are (Citko and Gračanin-Yüksek 2013).

In sum, both the mono- and bi-clausal analyses posit either a mono-clausal or a bi-clausal sources under the Coord-WhQ. However, the two types of analyses presuppose that the conjoined *wh*-phrases share the identical structure sources. Furthermore, some previous studies posit implausible restrictions on the licensing of conjoined *wh*-phrases, that could be disproven by a series of experimental studies (cf. Lewis et al. 2012).

4 A corpus investigation

Departing from these derivation-based analyses, this study aims to investigate the syntactic structure of Coord-WhQs by investigating empirical corpus data. In order to look into the linguistic patterns and properties of Coord-WhQs, we conducted a comprehensive corpus investigation, based on 1,156 tokens of authentic corpus data from the Corpus of Contemporary American English (COCA).

Our dataset contains 1,053 tokens with combinations of *wh*-words filling the identical gap (the SUBJ-SUBJ, ARG-ARG, and MOD-MOD pairs). The rest, 103 tokens are combinations of either SUBJ&MOD or ARG&MOD (see Figure 1). The investigation focused on those 103 tokens displaying the asymmetric filler-gap dependencies, adopting the variable STRUCTURE SHARING with two levels, COMPLETE SHARING and PARTIAL SHARING.

In **the COMPLETE SHARING** Coord-WhQs, the conjoined *wh*-phrases match in terms of their grammatical function and they can be considered to share the identical gap licensed by a single predicate:

(13) a. *Who and what* <u>mediates the sacrificial exchange</u>? (SUBJ-SUBJ, COCA 2017 ACAD)
= Who *mediates the sacrificial exchange* and what *mediates the sacrificial exchange*?

b. *Who and what* <u>were those girls so scared of</u>? (ARG-ARG, COCA 2015 SPOK)
= Who *were those girls so scared of* and *what were those girls so scared of*?

c. *How and when* <u>had I become the believer and Jack the doubter</u>? (MOD-MOD, COCA 2014 FIC)
= How *had I become the believer and Jack the doubter* and when *had I become the believer and Jack the doubter*?

In the underlined, shared predicate of the example (13a), the verb *mediate* licenses a SUBJ gap, and the conjoined *wh*-expressions seem to fill the syntactic gap without any difficulty. In (13b), the *wh*-expressions *who* and *what* can fill an ARG gap licensed by the verb *scared of*, serving as a prepositional object. Lastly in (13c), both *how* and *when* can fill a MOD gap of the verb *become*.

Meanwhile, in **the PARTIAL SHARING** Coord-WhQs, things are quite different from the previous one. In this group, the conjoined *wh*-pairs do not match in terms of their grammatical functions. Consider the following UNFILLED GAP examples first.

(14) a. *What and how* <u>am I teaching</u> and why? (ARG-MOD, COCA 2001 ACAD)
= What *am I teaching*   and   how *am I teaching* (***it***)?

b. *How and who* <u>should teach from these texts</u>? (MOD-SUBJ, COCA 2011 ACAD)
= How *should* (***someone_i***) *teach* [...]   and   who_i *should teach* [...] ?

In (14a), the first source clause would be a sentence like *I am teaching what* with the *wh*-phrase serving as an ARG of the verb *teach*. However, the second clause does not have any filler corresponding to the ARG gap licensed by the same verb. This leads the second clause to contain an unfilled ARG gap. In contrast, the example in (14b) contains an unfilled SUBJ gap in the first clausal source; The verb *(should) teach* licenses a SUBJ gap, which would be filled by *who*, and the second clausal source is grammatical even if we assume the underlying structure. However, the *wh*-phrase *how* cannot fill the SUBJ gap of the same predicate, meaning the first underlying clausal source would have no SUBJ from the beginning. These two cases display the filler-gap discrepancy caused by failing to fill the syntactic gap properly. On the other hand, the filler-gap discrepancy can be caused by a *wh*-phrase with no corresponding gap at all.
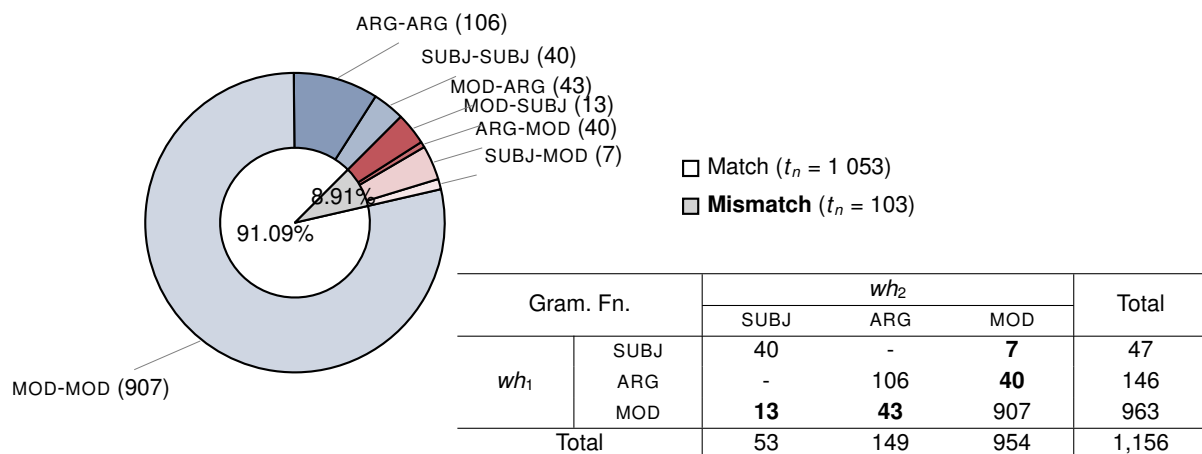

ARG-ARG (106)
SUBJ-SUBJ (40)
MOD-ARG (43)
MOD-SUBJ (13)
ARG-MOD (40)
SUBJ-MOD (7)
8.91%
91.09%
MOD-MOD (907)

☐ Match (t_n = 1 053)
■ **Mismatch** (t_n = 103)

Gram. Fn.		wh_2			Total
		SUBJ	ARG	MOD	
wh_1	SUBJ	40	-	**7**	47
	ARG	-	106	**40**	146
	MOD	**13**	**43**	907	963
Total		53	149	954	1,156

Figure 1: Distribution of grammatical functions of *wh*-words (raw freq.)

Structure sharing	COMPLETE SHARING	PARTIAL SHARING		Total
		Unfilled ARG gap	No SUBJ gap	
Raw freq.	1,061	73	22	1,156

Table 1: Structure sharing between *wh*-words

(15) *What and when <u>does</u> that <u>happen</u>?* (SUBJ-MOD, COCA 2019 ACAD)
      = What$_i$ happened and when does ***that***$_i$ happen?

As shown, the second *wh*-phrase *when* seems to fill a MOD gap licensed by the verb *happen* in the second clausal source at first glance. If so, there would be a problem; the first *wh*-phrase clause does not have any corresponding gap. One thing we have observed here is that, instead of filling a syntactic gap, the *wh*-expression seems to query additional information regarding the pronominal expression *that*, as coindexed. Table 1 shows the distribution of the COMPLETE and PARTIAL SHARING cases in our dataset.

5 Data discussion

5.1 On structure sharing and filler-gap discrepancy

In Section 3, we briefly mentioned that both the mono- and bi-clausal analyses assume the complete structure sharing of the *wh*-pairs. Then, all the analyses can account for the conjoined *wh*-pairs with identical grammatical functions like the examples in (13), and we named them 'COMPLETE SHARING Coord-WhQs' in the previous section. However, the problem is that our dataset yields not only COMPLETE SHARING but also PARTIAL SHARING Coord-WhQs, such as given in (14) and (15). These examples can disprove the mono- and bi-clausal analyses. As for the mono-clausal analysis, following Citko and Gračanin-Yüksek (2013; 2020), we argued that the analysis has to do with the superiority effect, and our dataset provides the counterexamples for the analysis.

(16) a. *What$_i$ and how$_j$ do students learn?* (COCA 2019 ACAD)

      b. Students learn [*what$_i$*] [*how$_j$*]? [ARG-MOD, Superiority ✓]

(17) a. *Where$_i$ and how many students$_j$ will they teach?* (COCA 1999 ACAD)

      b. *They teach [*where$_i$*] [*how many students$_j$*]? [MOD-ARG, Superiority ✗]

As introduced in Section 3, the mono-clausal analysis can account for examples such as (16), but it fails to properly cover examples like (17). Meanwhile, such examples as (17) can be covered by both the bi-clausal bulk and non-bulk sharing analyses, assuming either unselective or selective structure sharing of conjoined *wh*-pairs. However, both the bi-clausal analyses cannot account for the PARTIAL SHARING Coord-WhQs properly, since they display the filler-gap discrepancy, as given below.

(18) a. What$_i$ and when$_j$ does ***that***$_i$ happen _____$_j$?

      b. [$_{CP1}$ *What$_i$ (does ***that***$_i$ happen)$_k$] and [$_{CP2}$ when$_j$ (does that happen)$_k$ _____$_j$] ? [bi-clausal, bulk]

      c. [$_{CP1}$ *What$_i$ (does)$_k$ (***that***$_i$)$_l$ (happen)$_m$ _____$_i$] and [$_{CP2}$ when$_j$ does$_k$ that$_l$ happen$_m$ _____$_j$] ?
          [bi-clausal, non-bulk]

Granting the blind zone of the derivation-based approaches, we would like to closely look into linguistic patterns the authentic uses of Coord-WhQs provide in our dataset.

5.2 Structure of conjoined *wh*-pairs

Then, what would be an appropriate structure for Coord-WhQs? The investigation implies that it is plausible to assume that, as for the conjoined *wh*-pairs with matched grammatical functions, the *wh*-expressions share the identical gap. Thus, we can consider the Coord-WhQs with SUBJ-SUBJ, ARG-ARG, and MOD-MOD *wh*-pairs might fill the identical syntactic gap, licensed by the same predicate.

(19) a. [Who and what]$_i$ _____$_i$ had made him? (SUBJ-SUBJ, COCA 2000 MAG)

      b. [Who and what]$_i$ were those girls so scared of _____$_i$? (ARG-ARG, COCA 2015 SPOK)

      c. [Where and when]$_i$ can we act _____$_i$? (MOD-MOD, COCA 2010 ACAD)

Meanwhile, our dataset also yields examples where the paired *wh*-expressions mismatch in terms of their grammatical functions.

(20) a. [What$_i$ [and why$_j$]] are you yelling _____$_i$ _____$_j$? (ARG-MOD, COCA 2008 MOV)

      b. Upon your death, [how$_i$ [and to whom$_j$]] do you want your assets to be distributed _____$_j$ _____$_i$?
          (MOD-ARG, COCA 1992 TV)

4

In the meantime, such *wh*-phrases with asymmetric grammatical function can trigger an issue. Browne (1972) asserts Coord-WhQs with a 'SUBJ-MOD' pair are infelicitous:

(21) a. *Who and with what **broke** the glass? (Browne 1972: 223)

b. Who broke the glass   and   *with what **did** _____ **break** the glass?

He finds the reason for the infelicitousness from the asymmetric SAI (Subj-Aux Inversion) values of *wh*-phrases. As widely known, English interrogatives do not display SAI when a filler *wh*-expression serves as a SUBJ whereas a predicate of interrogatives requires to undergo the SAI with a non-SUBJ fillers (among others, Ginzburg and Sag 2000). Contrary to Browne (1972)'s prediction, our dataset provides a counterexample:

(22) a. Real time$_i$... What$_i$ and when **does** <u>that</u>$_i$ *happen*?   (SUBJ-MOD, COCA 2012 BLOG)

b. How and who **should** *teach* from these texts?   (MOD-SUBJ, COCA 2011 ACAD)

In (22), we can see the conjoined *wh*-phrases display asymmetric SAI as the first conjoined *wh*-phrase is of SUBJ-MOD pair and the second MOD-SUBJ pair. One intriguing linguistic pattern we can observe here is that, when the *wh*-phrases take asymmetric SAI value, whether the remaining part is inverted seems to depend on the SAI value of the second *wh*-expression. These findings indicate that English Coord-WhQs take the non-headed binary coordination structure, suggested by Bîlbîle and Gazdik (2012) in analyzing Hungarian Coord-WhQs, where the second conjunct serves as a phrasal head. This internal structural property can explain the syntactic pattern of Coord-WhQs with asymmetric SAI *wh*-pairs (see also Sag 2003; Chaves and Paperno 2007; Bîlbîle and Gazdik 2012).

6 Analysis

Until now, we have illustrated idiosyncratic linguistic patterns that English Coord-WhQs display. We have checked that it is plausible to assume that a conjoined *wh*-phrases in Coord-WhQs take a non-headed binary branching structure (among others, Sag 2003; Bîlbîie and Gazdik 2012; Abeillé and Chaves 2021).

For those with proper filler-gap relations, we suggest the following structural analysis:

(23) a. Who and what mediates the sacrificial exchange?   (COCA 2017 ACAD)
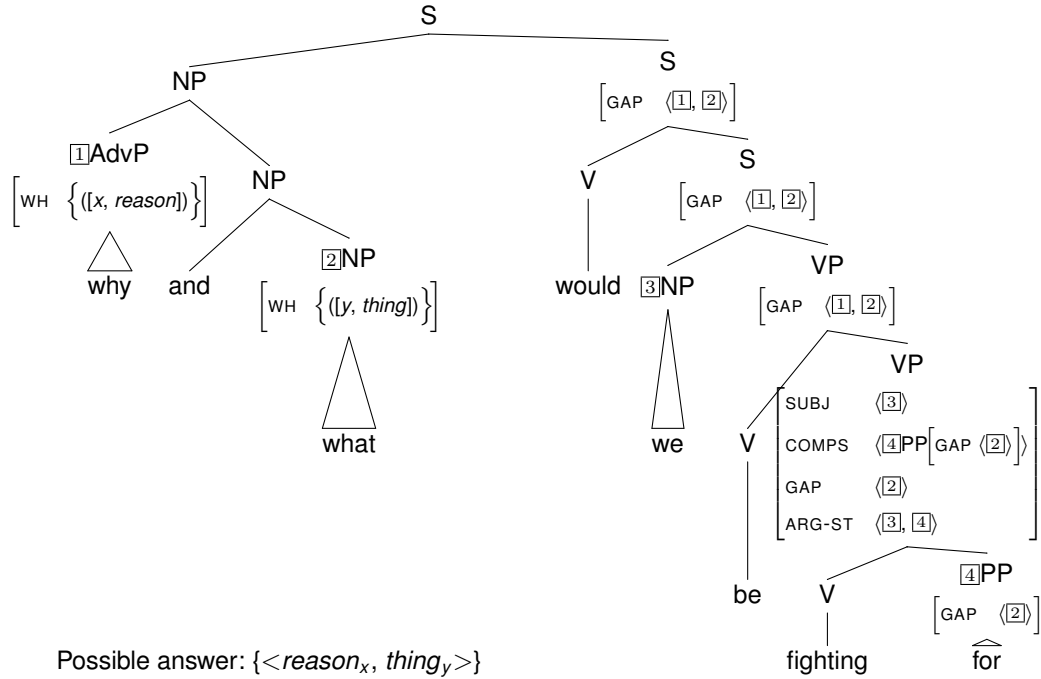
b.
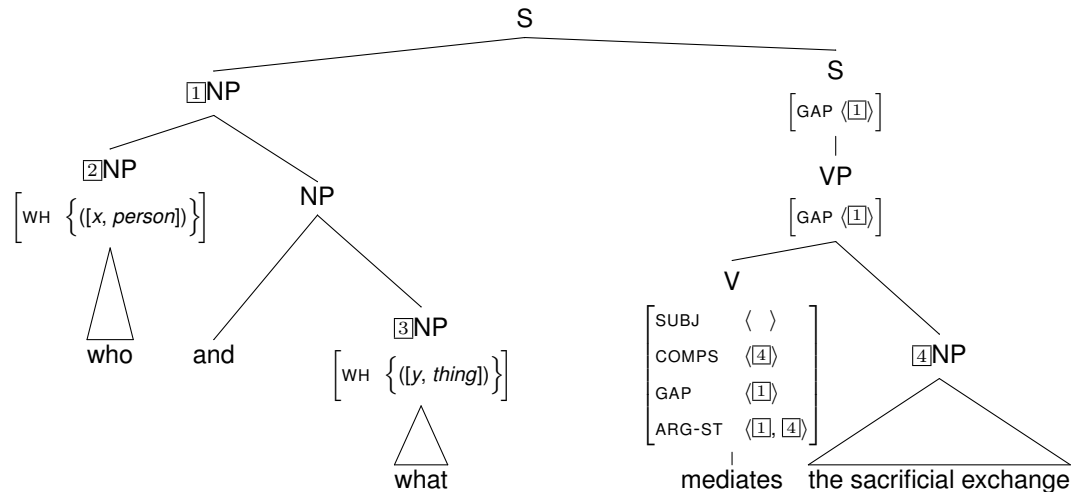
Possible answer: {<*person$_x$*, *thing$_y$*>}

Here, the two *wh*-phrases take the identical grammatical function, subjects of the verb *mediate*. The subject gap licensed by the verb is filled by the coordinated *wh*-phrases as a whole with respect to *head-filler-construction*.

The analysis can be adopted to most of the *wh*-phrases with different grammatical functions (or, the PARTIAL SHARING cases) as well:

(24) a. Why and what would we be fighting for?   (COCA 1990 NEWS)

b.

S
NP — S [GAP ⟨[1], [2]⟩]

[1]AdvP [WH {([x, reason])}]
why

NP — and — [2]NP [WH {([y, thing])}]
what

S [GAP ⟨[1], [2]⟩]
V — would
S [GAP ⟨[1], [2]⟩]
[3]NP — we
VP [GAP ⟨[1], [2]⟩]

VP
V [SUBJ ⟨[3]⟩, COMPS ⟨[4]PP[GAP ⟨[2]⟩]⟩, GAP ⟨[2]⟩, ARG-ST ⟨[3], [4]⟩]
be
V — fighting
[4]PP [GAP ⟨[2]⟩]
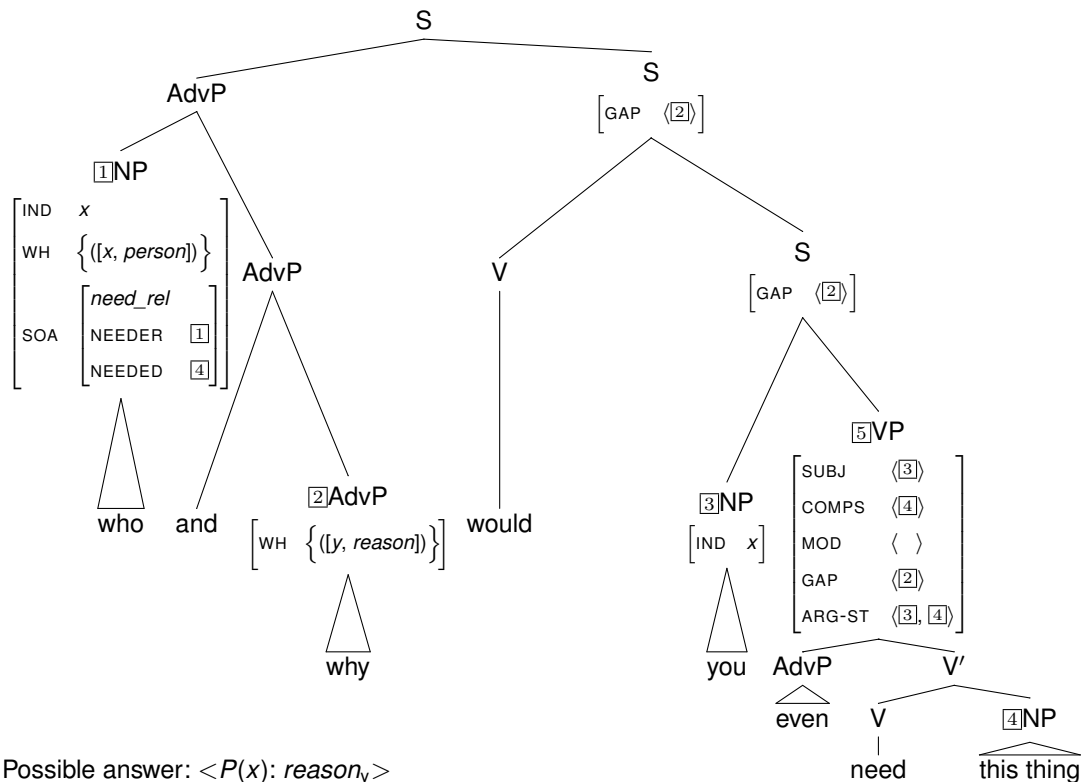for

Possible answer: {<*reason*$_x$, *thing*$_y$>}

As given, the first conjunct *why* serves as a filler of the modifier gap whereas the second *what* as an adjunct. The conjoined *wh*-expressions are expected to properly fill the syntactic gap according to the ARG(ument)-ST(ructure) of the predicate *fight for* (see also Abeillé and Chavez 2007). Furthermore, the *wh*-pairs mismatch in terms of their SAI value. In this case, the rest S with gaps is not inverted following the SAI value of the head *what* of the conjoined *wh*-phrase. The two Coord-WhQs given above in (23)-(24) are to be responded with *single-pair* answers <*person*$_x$, *thing*$_y$> and <*reason*$_x$, *thing*$_y$>.

Now, the remaining type is Coord-WhQs displaying filler-gap discrepancy, one of whose conjoined *wh*-phrases does not have any corresponding gap. We propose that the *wh*-expression with no corresponding gap has to do with asking additional information regarding its coreferring expression. For instance:

(25) a. Who and why would you even need this thing? (Whitman 2002: 300)

b.

S
AdvP — S [GAP ⟨[2]⟩]

[1]NP [IND x, WH {([x, person])}, SOA [need_rel, NEEDER [1], NEEDED [4]]]
who

AdvP — and — [2]AdvP [WH {([y, reason])}]
why

S [GAP ⟨[2]⟩]
V — would
S [GAP ⟨[2]⟩]

[3]NP [IND x] — you
[5]VP [SUBJ ⟨[3]⟩, COMPS ⟨[4]⟩, MOD ⟨ ⟩, GAP ⟨[2]⟩, ARG-ST ⟨[3], [4]⟩]

AdvP — even
V' — V need — [4]NP this thing

Possible answer: <*P(x)*: *reason*$_y$>

6

As shown, the verb *need* takes a gap in its modifier position but not the one regarding its subject. One thing to note is that the first *wh*-expression receives a reading of a question like '*Who are you?*', and the second one successfully fills the modifier gap licensed by the verb *need*. In this regard, the possible answer would be a *single-pair* reading with a predicate $P(x)$ and $reason_y$.

The non-derivational mono-clausal analysis we proposed here takes the following advantages. First, the bi-clausal analysis requires a series of accommodations to convert a *pair-list* reading of bi-clause into a *single-pair* reading of Coord-WhQs. In contrast, this mono-clausal analysis could be supported by the fact that the possible answer to this is a *single-paired* set of answers $<person_1, thing_1>$ and thus Coord-WhQs receive a *single-pair* reading more intuitively. Second, this analysis can account for the filler-gap dependency relations as well as the filler-gap discrepancy relations observed in the empirical corpus data.

7 Conclusion

We started by enumerating complex syntactic restrictions on English Coord-WhQs by pointing out weaknesses previous analyses possess. To see authentic patterns of Coord-WhQs in actual usage, we performed a corpus investigation based on the authentic usages from the COCA. The result immediately challenged what has been assumed by previous studies. Our dataset showed that [1] *wh*-phrases conjoined in Coord-WhQs can display asymmetric SAI value and the SAI value of the remaining predicate depends on the SAI value of the nearest, second *wh*-phrase, [2] not all conjoined *wh*-phrases in Coord-WhQs share their structure, and [3] in 'SUBJ-MOD' *wh*-pairs, Coord-WhQs can display the filler-gap discrepancy, where the first *wh*-expression does not take any corresponding gap. Granting what we have seen, we have suggested a non-derivational mono-clausal analysis with a conjoined *wh*-phrase, the latter of whose *wh*-expression serves as a phrasal head and the rest as a sort of specifier. The novel analysis we suggest is expected to solve the problem of how the asymmetric linguistic properties of English Coord-WhQs can be accounted as well as how it receives its unique *single-pair* reading.

References

Anne Abeillé and Rui P. Chaves. 2021. Coordination. In Stefan Müller, Anne Abeillé, Robert D. Borsley, and Jean-Pierre Koenig (eds.), *Head-Driven Phrase Structure Grammar: The handbook*, 725-776. Berlin: Language Science Press.

Bîlbîie, Gabriela and Anna Gazdik. *wh*-coordination in Hungarian and Romanian multiple questions. *Empirical Issues in Syntax and Semantics* 9: 19-36.

Browne, Wayles. 1972. Conjoined question words and a limitation on English surface structures. *Linguistic Inquiry* 3(2): 223-226.

Citko, Barbara. 2013. The puzzles of *wh*-questions with coordinated *wh*-pronouns. In Theresa Biberauer and Ian Roberts (eds.), *Challenges to linearization*, 295-330. Berlin: Walter de Gruyter.

Citko, Barbara and Gračanin-Yüksek, Barbara, and Martina Gračanin-Yüksek. 2013. Towards a new typology of coordinated *wh*-questions. *Journal of Linguistics* 49: 1-32.

Citko, Barbara, and Martina Gračanin-Yüksek. 2020. Conjunction saves multiple sluicing: *How *(and) why?*. *Glossa: a journal of general linguistics* 5(1): 1-29.

Ginzburg, Jonathan and Ivan Sag. 2000. *Interrogative investigations: The form, meaning and use of English interrogatives*. Stanford, CA: CSLI Publications.

Gribanova, Vera. 2009. Structural adjacency and the typology of interrogative interpretations. *Linguistic Inquiry* 40(1): 133-154.

Huddleston, Rodney and Geoffrey K. Pullum et al. 2002. *The Cambridge grammar of the English language*. Cambridge: Cambridge University Press.

Lewis, Shevaun, Bradley Larson and Dave Kush. 2012. What and when can you fill a gap with something? In Dianne Bradley, Eva Fernàndez, and Janet Dean Fodor (eds.), *Proceedings of the 25th CUNY Human Sentence Processing Conference*, 28. New York, NY: City University of New York.

Sag, Ivan A. 2003. Coordination and underspecification. In Jong-Bok Kim and Stephen Wechsler (eds.), *Proceedings of the 9th International Conference on HPSG*. 267-291. CA, Stanford: Stanford University.

Pollard, Carl and Ivan. A. Sag. 1994. *Head-Driven Phrase-Structure Grammar*. IL, Chicago: University of Chicago Press.

Potter, David and Michael Frazier. 2021. English *wh* & *wh* constructions: Conjoin and move. In Rachel Soo et al. (eds.), *Proceedings of the 38th West Coast Conference on Formal Linguistics*. 355-365. Somerville,

MA: Cascadilla.

Whitman, Neal. 2002. *Category neutrality: A type-logical investigation*. Ph.D. dissertation, Ohio State University.