Wh & Wh: Semantic and Syntactic Arguments for Clausal Coordination

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1. Introduction

Multiple wh-questions where the wh-phrases are conjoined with the coordinator ‘and’ occur in multiple wh-fronting languages such as Slavic, Romanian and Hungarian. It has been a matter of contention in what way regular multiple wh-questions, such as the Polish one in (1), are related to the coordinated multiple wh-questions, as in (2).

(1) Kto co kupił?
    who what bought
(2) Kto i co kupił?
    who and what bought

In Tomaszewicz (2011) I have argued that coordinated multiple wh-questions (from now on Coordinated-WHs), have a very different syntax, and consequently, semantics, than regular multiple wh-questions (Mult-WHs). While the structure of a Mult-WH is mono-clausal, the structure of a Coordinated-WH is bi-clausal, where two wh-questions are conjoined and the first clause contains ellipsis. While a bi-clausal analysis of Coordinated-WHs has been proposed before, one notable novel aspect of my analysis was that the second conjunct can be a multiple wh-question. In such a case, the result is a reading that involves multiple pairs. This reading is different from the multiple-pair reading in Mult-WHs, as it involves the conjunction of a single and a multiple wh-question.

The present paper provides more detailed evidence from Polish that a

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special kind of a multiple-pair reading is found with Coordinated-WHS. The findings should also apply to other languages with Coordinated-WHS. Alternative accounts that treat Coordinated-WHS as single clauses or as conjunctions of two single wh-questions cannot derive this special kind of a multiple-pair reading.

2. Previous approaches to the phenomenon

2.1 Bi-clausal analysis

According to one of the earliest accounts of Coordinated-WHS, Browne (1972) and Wachowicz (1974), Coordinated-WHS involve the coordination of two clauses (as in (3)).

(3) \[ [[\text{CP wh}_1 [\text{TP ... wh}_1 ...]]] \text{ and } [[\text{CP wh}_2 [\text{TP ... wh}_2 ...]]]\]

The majority of the subsequent work on the topic rejects the uniform bi-clausal analysis of Coordinated-WHS. Among the exceptions is Ratiu (2009), who analyses Romanian Coordinated-WHS in terms of multidominance, where the TP is shared and a linearization algorithm results in it being pronounced in the second clause. This is also the approach of Gracanin-Yuksek & Citko (2010), who examine several languages and argue for Russian, Serbian/Croatian and Polish that either a bi-clausal or a mono-clausal structure is available. In non-multiple wh-fronting languages such as English the bi-clausal structure is the only way to derive questions with conjoined wh-phrases.

A similar position is taken by Haida & Repp (to appear) who argue that only in languages with movement of wh-phrases into multiple specifiers of a FocP, coordination of the wh-phrases by sideward movement is possible within a single clause.

The main objection in the literature to the structure in (3) concerns the cases where the wh-phrases are both arguments. This is so because in languages that do not have object pro-drop, such as Bulgarian, a null pro object has to be stipulated in the second conjunct (4) (this issue is discussed at length in Kazenin (2002), Gribanova (2009) and Ratiu (2009)).

(4) \[ [[\text{CP [kakvo]} [\text{TP pro podarihte t}_j]]] i [[\text{CP na kogo, [TP pro what pro}_{\text{SUBJ}} \text{gave}_{2\text{PL}} and to whom pro}_{\text{SUBJ}}] \]
podarihte pro t_i]
gave_{PL} pro_{OBJ}

‘What did you give and to whom?’

To avoid this problem Ratiu (2009) treats the gap as parasitic to an indefinite pronoun in the first conjunct, while others turn to a monoclusal account for such cases.

2.2 Mono-clausal analysis
The majority of recent analyses of Coordinated-WHs assume a monoclusal derivation where the wh-phrases are fronted in the same way as in regular Mult-WHs but, additionally, the coordinator is inserted after the movement. The result can be represented either as a conjunction phrase (5)a or as two specifiers separated by an intervener (5)b.

(5)  a. $[CP [\& P_1 wh_1 & wh_2] [TP ... wh_1 ... wh_2 ... ]]$ (Gribanova, 2009)
     b. $[CP wh_1 & wh_2 [TP ... wh_1 ... wh_2 ... ]]$ (Merchant, 2007)

The coordinator is claimed to block whatever process is responsible for multiple-pair readings (e.g. absorption in terms of Higginbotham & May, 1981). Thus, Coordinated-WHs are predicted, and claimed, to have only single-pair readings in the work on Russian by Kazenin (2002), Gribanova (2009), Paperno (2009), on Polish by Cichocki (1983), on Romanian by Comorovski (1989), on Hungarian by Lipták (2003), on Czech by Skrabalova (2006), and on Vlach by Merchant (2007).

Most importantly, once a syntactic intervention effect is assumed, the coordinator as the intervener must be treated as a meaningless element, since it cannot conjoin constituents before movement. Gribanova (2009) supports this conclusion arguing that intervention by a clitic in Serbo-Croatian also blocks multiple-pair readings. Nevertheless, the occurrence of the conjunction ‘and’ in Coordinated-WHs is common to all multiple wh-fronting languages, which cannot be accounted for on the view that the intervener is a spurious element. Moreover, Gracanin-Yuksek (2007) and Citko & Gracanin-Yuksek (2009) and Haida & Repp (to appear), conclude that Coordinated-WHs can be derived either from mono-clausal or bi-clausal structures even in the same language. As a consequence, the same coordinator needs to be semantically empty in mono-clausal Coordinated-WHs and meaningful in bi-clausal Coordinated-WHs.
2.3 **Coordinated WHs allow multiple-pair readings**

Coordinated-WHs should never allow a multiple-pair reading if the presence of the coordinator as in (5) blocks the derivations of this type of reading, or if they result from a coordination of two single wh-questions as in (3).

In Tomaszewicz (2011) I provided data from Polish, Bulgarian, Russian and Romanian Coordinated-WHs where a multiple-pair reading (of a special kind) is present. Scott (2010) too observes that multiple-pair answers are possible (though she does not note the special meaning effect). I argued that the special kind of multiple pair reading in Coordinated-WHs can only be accounted for on a bi-clausal analysis, where a single wh-question is conjoined with a multiple wh-question, followed by ellipsis in the first conjunct. In this paper, I provide a more detailed discussion of the restrictions on the multiple-pair readings of Coordinate-WHs found in Polish, which can only be explained on the proposed bi-clausal account.

3. **Coordination of Two Questions and Multiple-Pair Readings**

3.1 **Multiple-pair readings of a special kind**

Here I expand on the data provided in Tomaszewicz (2011) that contradict the claim prevalent in the literature that Coordinated-WHs are restricted to single-pair readings. The Bulgarian example in (6) clearly has a multiple-pair readings:

(6) Povečeto gosti donesoха неšто, no ne znam koj i kakvo.
most guests brought something but not who and what
'The majority of the guests brought something, but I don't know who what.'

However, these readings are different from those obtained with regular Mult-WHs. As mentioned above, multiple wh-questions are typically expected to be answered by a listing of pairs. Coordinated-WHs involve a conjunction of two questions, and because of this, as we will show, the range of contexts in which they can appear is more restricted than that of Mult-WHs. On the present proposal, Coordinated-WHs first ask for the identity of a single wh-phrase and then for the pairing. The evidence for this special reading comes from the following contrast.
Compare the Bulgarian (6) above and its minimally different counterpart in (7):

(7) #Всички гости донесоха нещо, но не знаям кой и какво.
    all guests brought something but not know who and what
    'All of the guests brought something, but I don't know who what.'

In contrast to (6) above, (7) is infelicitous, which cannot be accounted for on the bi-clausal analysis in (3), nor on the mono-clausal approach in (5), even if Coordinated-WHs were acknowledged to have multiple-pair readings. The contrast between the use of a universal quantifier in (7) and a majority quantifier in (6) can be replicated for all the languages mentioned.

In order to derive this special kind of reading, and explain the contrast between (6) and (7), I have proposed in Tomaszewicz (2011) that, in addition to (3), Coordinated-WHs can be derived by a coordination of a single and a multiple wh-question as shown in (8). The syntactic consequences are such that due to the multiple wh-fronting in the second conjunct (8)b, the multiple-pair reading of Coordinated-WHs will be found only in languages with multiple wh-fronting. This step is also crucial for the ellipsis in the first conjunct to take place under identity. In the subsequent step the two identical wh-phrases in both conjuncts undergo ATB movement, cf. (8)c.

(8) a.       [ ...wh₁ ... ] & [ ...wh₁...wh₂... ]

           b. [ wh₁ [ ...wh₁ ... ]] & [ wh₁ wh₂[ ...wh₁...wh₂... ]]

           c. [ wh₁ [ wh₁[ ...wh₁ ... ]] & [ wh₁, wh₂[ ...wh₁...wh₂... ]]

Thus, the semantic result of the derivation in (8) is that a Coordinated-WH is necessarily interpreted as two questions, the first asking for the identity of the single wh-phrase referent, the second asking for the pairing, as shown by the English paraphrase in (9)c.

(9) a. Kto i co kupił?
       who and what bought
b. [who [whe [TP bought ∅]]] & [whe what [TP bought]]
c. Who bought something? And who bought what?

Note that the first conjunct contains an empty pronoun interpreted as an indefinite.¹ For the present discussion, the crucial observation is that each of the conjuncts has to be felicitous with respect to the context, i.e. the interpretation of the null argument in the first conjunct as an indefinite has to be felicitous and the second conjunct has to felicitously ask for the pairing.

### 3.2 Felicity requirements on the conjuncts

It is the infelicity of the first conjunct that explains the infelicity of the Coordinated-WH in (7). The answer to the first conjunct, ‘Who bought something?’ is already given by the context – it is ‘everybody’, therefore it is simply redundant to ask the question in the first conjunct. In (6) the single wh-question is felicitously asking who the guests were who brought something, in a context where it is known that most guests brought a present.

The second conjunct also has to be independently felicitous, as the following examples (10)-(12) show. If the answer to the question in the second conjunct is already given by the preceding context, i.e. by the answer to the first conjunct, the result is infelicitous. This is illustrated in (11), where in the context where there are two people only, the identification of one of them makes it redundant to ask the question in the second conjunct (either a multiple or a single wh-question). The English paraphrases in (12) make this contrast clear.

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(10) Kto kogo pierwszy uderzył?
who whom first hit
(11) #Kto i kogo pierwszy uderzył?
who and whom first hit
(12) a. Who hit the other first? #And who hit whom first?
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¹ In Tomaszewicz (2011) I argue that the interpretation of the object as an indefinite follows from the existential presupposition associated with Coordinated-WHs (which cannot be uttered out-of-the-blue). The context has to entail that somebody bought something in order for (9) to be uttered felicitously.
b. Who hit the other first? #And who did he hit first?

The context in (11) clearly allows for a single-pair answer since only two people are involved, thus the infelicity of a Coordinated-WH is unexpected on mono-clausal accounts. Mono-clausal accounts predict that whenever a regular Mult-WH question is possible, its single-pair version should follow from the addition of the semantically inert intervener ‘and’. The answer to (10) needs to provide the identity of two people and no more, since from the context we know that only two people were involved. The infelicity of (11) suggests that it cannot simply be a single-pair version of (10). On a bi-clausal analysis, (11) can either be a conjunction of a single and a multiple wh-question as in (8), or a conjunction of two single wh-questions as in (3). Both derivations are excluded in the given context. The answer to the question in the second conjunct is entailed in the answer to the first – if person A hit someone, then the other person must be person B.

3.3 Degree questions

A new argument in support of the view that Coordinated-WHs are not simply single-pair versions of Mult-WHs comes from examples with predicates taking measure phrase arguments. On a bi-clausal analysis, for the ellipsis to take place under identity, the first conjunct needs to contain a predicate identical to that in the second conjunct, as well as a null pronoun to match the null pronoun/wh-trace in the second conjunct. The relevant configurations are shown below for the coordination of two single wh-questions (13), and of a single and a multiple wh-question (14).

(13)  [[wh₁ [ ... wh₁ ... ⋄ ...]] & [wh₂ [ ... ⋄ ... wh₂ ... ]]]
(14)  [wh₁ [wh₁ [ ... wh₁ ... ⋄ ... ]] & [wh₁ wh₂ [ ... wh₁...wh₂... ]]]

It follows then that if the interpretation of the null argument in the first conjunct as an indefinite is not felicitous, the whole Coordinated-WH will not be felicitous. Null measure phrase arguments are infelicitous with predicates such as mieć n wzrostu (‘to have n in height’, meaning ‘to be n tall’, where n stands for a numeral and a unit of measurement) or mieć n lat (‘to have n years’ meaning ‘to be n years old’). Therefore, it is
the infelicity of the first conjunct that results in the infelicity of the following Coordinated-WHs:

(15)  #Kto i ile ma wzrostu?  Polish
        who and how.much has height
        ‘#Who measures something in height and how much do they
         measure in height?’
        ‘#Who measures something in height and who measures how
         much in height?’

(16)  #Kto i ile ma lat?
        who and how many has years
        ‘#Who is some years old and how old are they?’
        ‘#Who is some years old and who is how old?’

The first conjunct in (15) asks who has any height at all, and the first conjunct in (16) asks who is of any age at all, both of which are nonsensical. Importantly, the corresponding Mult-WHs are perfectly fine since they are asking for pairings of the measures of height/age with people. A null measure phrase can also result in an odd reading as in the following case where it is naturally expected that all employees receive salaries. The only reading available for (17) asks who earns anything at all at the institute and how much money those people who do earn salaries make. A corresponding Mult-WH would be unproblematic.

(17)  #Kto i ile zarabia w waszym instytucie?
        who and how much earns in your institute
        ‘At your institute, who earns something and how much do they earn?’
        ‘At your institute, who earns something and who earns how much?’

3.4 “Superiority” effects
In the next set of examples, under certain conditions a null argument in the first conjunct excludes only one of the two available derivations of a Coordinated-WH, the coordination of a single and a multiple wh-question. Observe first that the Polish Mult-WHs in (18) and (19) do not show any syntactic superiority effects.

(18) a. Kto kiedy wysłał listy?  Polish
In Coordinated-WHs we seem to observe a superiority effect in that (19)b in comparison to (19)a is not acceptable in the situation where we want to find out who, out of the people who were assigned this task, sent out their batch of letters when.

In (19)b the first conjunct asks about the time of a single event (the verb in the perfective form), therefore it is redundant to ask ‘when’ again in the second conjunct, i.e. only a single wh-question is felicitous.

(19) a. Kto i kiedy wysłał listy?
   who and when sent.Prf letters
   ‘Who sent the letters and who sent the letters when?’
   ‘Who sent the letters and when did they send the letters?’

b. Kiedy i kto wysłał listy?
   when and who sent.Prf letters
   ‘When did somebody send the letters and who sent the letters when?’
   ‘When did somebody send the letters and who send the letters then?’

When the verb is in the imperfective aspect, the first conjunct in (20)b is asking when multiple instances of sending letters have taken place, so it is compatible with the following multiple-pair question: ‘Who has been sending letters when?’ (a suitable setting would be an office where several people’s job is to send out letters). Thus, we see no contrasts in “superiority” between (20)a and (20)b.

(20) a. Kto i kiedy wysyła listy?
   who and when sent.Imp letters
   ‘Who has been sending letters and who has been sending letters

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2 I would like to thank John Bailyn for suggesting to me that sometimes superiority violations emerge with Coordinated-WHs. He credits Tanya Scott with making the observation for Russian.
when?’
‘Who has been sending letters and when have they been sending letters?’

b. Kiedy i kto wysyłał listy?
when and who sent.Imp letters
‘When has somebody been sending letters and who has been sending letters when?’
‘When has somebody been sending letters and who has been sending letters at those times?’

The contrasts in degree questions and the apparent “superiority effects” cannot be accounted for on a mono-clausal approach which assumes a strict distinction between multiple-pair and single-pair readings with the latter derived from the former by means of a syntactic intervener. We have seen that the presence of the coordinator does not exclude a reading where multiple pairs are involved. Moreover, the cases where a Coordinated-WH was not available, while the corresponding Mult-WH was fine, could not be explained by a simple contrast between a single and a multiple pair reading. On a bi-clausal approach, each of the conjuncts has to be felicitous on its own, and I have shown that the interpretation of the elided constituent in the first conjunct has an effect on the felicity of the whole Coordinated-WH question.

4. Ellipsis in Coordinated-WHs

I have argued in Tomaszewicz (2011) that Coordinated-WHs are associated with an existential presupposition, which allows the ellipsis in the first conjunct. I show here that the ‘missing’ proposition can be referred to by an anaphoric pronominal element to. Crucially, this element is allowed in Coordinated-WHs but not in regular Mult-WHs.

The uninflected demonstrative pronoun to (lit. ‘this’) is a topic/focus particle in Slavic. Crucially, the pronominal has clausal scope, i.e. it is anaphoric to the preceding proposition (Progovac 1998, Citko 2000). The pronominal is associated with focus as indicated by the translation of the Polish sentence in (21)B as a cleft in English.

(21) A: Janek przyniósł Marii bukiet. Polish
    John brought MariaDAT bouquet

    B: To przyniósł Marii bukiet.
    This brought MariaDAT bouquet
'John brought a bouquet for Maria.
B: O tak! I to już w niedzielę.
   Oh yes! And to already on Sunday
   'Oh, yes, and it was on Sunday that he did it.'

The to in (21)B would not be felicitous without the immediately preceding context in (21)A. The fact that the focus pronominal to can occur in the second conjunct of a Coordinated-WH (22) in Polish and Bulgarian means that there is an appropriate antecedent for it in the elided first conjunct, i.e. the proposition ‘somebody bought something’, as schematized in (24). In a Mult-WH to cannot appear in between the wh-phrases, as can be seen in (23).

(22)  Koj i to kakvo kupi?        Bulgarian
    who and to what bought
   'Who bought something and what was it that they bought?'
(23)  *Koj to kakvo kupi?
    who to what bought
   'What was it that who bought?'
(24)  who [who [TP who bought something] & [to who what [TP who bought what]]]

Kazenin (2002) argues that the coordinator is meaningless because it is not found in answers to Coordinated-WHs. Subject and object cannot be conjoined as shown in (25). However, we observe that the existential presupposition in a Coordinated-WH allows for an answer with a cleft like construction based on to (25)B’, which is infelicitous with a non-coordinated Mult-WH (26)A-B.

(25) A: Kto i jakie miasto podbił?    Polish
    who and which city conquered
B: *Wandalowie i Rzym (podbili).
   Vandals and Rome (conquered)
B’: Wandalowie i to Rzym.
   Vandals and to Rome
   'Vandals, and it was Rome (that they conquered)'
(26) A: Kto jakie miasto podbił?
    who which city conquered
The pronominal to in (25)B’ refers back to the proposition expressed by the first conjunct that the Vandals conquered some city. The availability of to in Coordinated-WHs such as (22) and in the answer to (25)A is unexplained on a mono-clausal account. The ellipsis in the first conjunct accounts for the empirical observation that to can occur in Coordinated-WHs but not in Mult-WHs. The elided presupposed proposition is interpreted, which is why the pronominal focus marker to can refer back to the proposition in the elided first conjunct.

We conclude that the bi-clausal analysis can explain without stipulation why the distribution of Coordinated-WHs, in contrast to Mult-WHs, is restricted to the contexts that satisfy the existential presupposition. In those contexts the elided information in the first conjunct is entailed by the common ground. This restriction complements the previous data showing that the way the first conjunct is interpreted affects the felicity of the whole Coordinated-WH.

5. Syntactic Evidence for the Coordination of Two Questions

In Tomaszewicz (2011) I presented syntactic evidence for the coordination of two (or more) questions in a Coordinated-WH. I showed that, as expected, one of the conjuncts can be a yes/no-question, since special yes/no-question particles (e.g. da li in Serbo-Croatian as observed in Browne (1972), or czy in Polish) can also be found in Coordinated-WHs. Those particles never co-occur with wh-phrases in regular Mult-WHs, which argues against a mono-clausal account. Regarding Coordinated-WHs as coordinations of two questions also allows us to naturally account for the fact that in contrast to Mult-WHs, Coordinated-WHs allow high (speaker-oriented) adverbs between the wh-words. Additionally, the availability of the clausal coordinator a in Polish and in Bulgarian is a further indication of a bi-clausal structure.

One additional piece of evidence against a mono-clausal source for conjoined wh-arguments comes from the fact that left-branch extraction (LBE) is not possible in Coordinated-WHs, cf. (27)b. Polish allows left-
branch extraction in regular Mult-WHs (27)a, so if Coordinated-WHs were also underlyingly mono-clausal this difference would be unexplained.

(27) a. Jaki kto kupił samochód swojej żonie?
   which who bought car self's wife{DAT
   ‘Who bought what kind of a car for his wife?’

   b. *Jaki i kto kupił samochód swojej żonie?
      which and who bought car self's wife{DAT

   ATB does not allow LBE when the “remnant” in the second conjunct and its “correspondent” in the first conjunct are the same (Citko 2006), so that (29), in contrast to (28), is ungrammatical. This illicit configuration for ATB is, however, needed to satisfy the identity requirement on ellipsis in a Coordinated-WH as shown in (30).

(28) Jaki Jan kupił samochód a Marek sprzedał motor?
   which Jan bought car and Marek sold motor-bike
   ‘What kind of a car did Jan buy and what kind of a motor-bike did Marek sell?’

(29) *Jaki Jan kupił samochód a Marek sprzedał samochód?
    which Jan bought car and Marek sold car
    ‘What kind of a car did Jan buy and what kind of a car did Marek sell?’

(30) *[Jaki, [t,-[∅ kupił t, samochód]] i [t, kto, [t, kupił t, samochód]]?]
    which bought car and who bought car

   Thus, on a bi-clausal account involving ATB movement the incompatibility of Coordinated-WHs with LBE follows from the independent restriction on the remnants.

   We conclude that in addition to the data showing that the interpretation of the ellipsis in the first conjunct affects the felicity of a Coordinated-WH, the syntactic facts presented in Tomaszewicz (2011) and in the above section provide strong evidence for a bi-clausal account on which either two single wh-questions or a single and multiple wh-question are conjoined.

6. Conclusion
I have examined several properties distinguishing Coordinated-WHs from regular Mult-WHs. The new data support the bi-clausal account that I proposed in Tomaszewicz (2011). On that analysis, Coordinated-WHs are compositionally derived by a conjunction of two single wh-questions or a single and a multiple wh-question, which is followed by ATB movement of identical wh-phrases and ellipsis in the first conjunct. In the present paper I have provided additional arguments for (i) a special kind of a multiple pair reading when the second conjunct is a multiple wh-question, and (ii) existential presupposition carried by Coordinated-WHs. These two properties result in the specific restrictions on the availability of Coordinated-WHs. They are felicitous only if both of the conjuncts are independently felicitous and only if the context satisfies the existential presupposition. These findings support the view that Coordinated-WHs are not simply single-pair versions of Mult-WHs, since in the cases where a regular Mult-WH is available but the corresponding Coordinated-WH is not, it is the interpretation of the elided constituent that affects the felicity of the whole construction.

References

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