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On the Syntax of Conjoined Wh Words in English

Questions

Jane Grimshaw

This paper is a brief investigation of the syntax of questions where wh phrases appear in conjunctions: there are two such constructions in English, exemplified by (1) and (2):

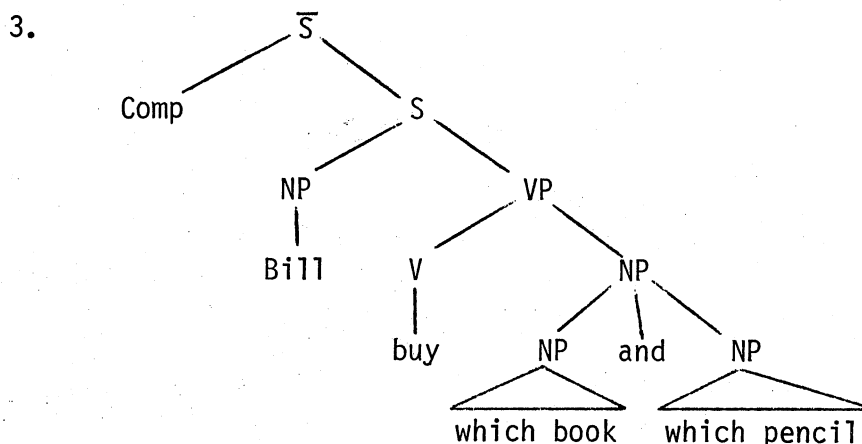
1. a. Which book and which pencil did John buy?
b. How tall and how heavy is John?
c. How quickly and how accurately did John follow your instructions?
d. When and where did Sam buy that book?
2. a. Which book did John buy, and which pencil?
b. How tall is John, and how heavy?
c. How quickly did John follow your instructions, and how accurately?
d. When did Sam buy that book, and where?

I will refer to conjunctions like those in (1) as complementizer conjoined wh phrases (CC wh phrases). Those in (2) will be called S-final conjoined wh phrases (SFC wh phrases). It will be shown that CC wh phrases are to be analyzed as resulting from wh-fronting of an underlying conjunction of wh phrases, while SFC wh phrases are cases of Sluicing (Ross (1969)).

To the best of my knowledge the only discussion of these constructions in the literature is contained in a squib by Wayles Browne (1972). Discussion of his proposal will be deferred until the relevant facts have been presented.

1. Complementizer conjoined wh-words

It was claimed above that the wh phrases in (1) are underlyingly conjoined: this entails that the underlying structure of (1a) is (3).



This analysis together with known generalizations about the syntax of conjunctions makes very strong predictions about the form of CC wh phrases. These predictions will be seen to be correct.

First, since only constituents of the same syntactic category can be conjoined, only wh constituents of the same syntactic category should be able to occur conjoined in Complementizer position.^{2,3} Note that all the examples in (1) conform to this requirement: in (1a), NPs have been conjoined, in (1b) Adjective Phrases have been conjoined, and in (1c) and (1d) Adverbial or Prepositional Phrases have been conjoined. Consider the result if an Adverbial or Prepositional phrase is conjoined with a Noun Phrase:

4. a. *{What and how hard} did John kick
 {How hard and what}
 b. *John asked {who and where} Bill had seen
 {where and who}

Given the proposed analysis, the ungrammaticality of (4) follows from the fact that NPs and AdvPs cannot form basic conjunctions. (5) shows this more clearly: the relevant wh phrases remain in their underlying positions, and the ill-formedness of the conjunctions is apparent.

5. a. *Who kicked { how hard and what } ?
 { what and how hard }
 b. *John asked who saw { who and where }
 { where and who }

(The examples in (5) must be read as normal multiple wh-questions, not as questions with SFC wh phrases as in (2). That is, on the relevant reading there is no intonation break between the first and the second members of the conjunction.)

A second prediction made by the analysis is that even where the requirement that the members of the conjunction be of the same category is met, if for some other reason it is impossible for those members to

be underlyingly conjoined, a sentence with the members conjoined in complementizer position will be ungrammatical. So consider the case where two NPs are conjoined: this conjunction will meet the identical category requirement (cp (1a)). However, if one of the NPs is say, a subject, and the other is an object, these two NPs could not form an underlying conjunction. The prediction is thus made that an example like (6), underlyingly as in (7), will be impossible, and this is obviously true.

6. *John asked { who and what } bought
 { what and who }

7. John asked \bar{S} [\bar{S} [who bought what] \bar{S}] \bar{S}

A third consideration supporting this analysis comes from subcategorization. (1a) (repeated here as (8a) hows that conjoined NPs can meet the requirement on buy that it have an underlying direct object:

8. a. Which book and which pencil did John buy?
 b. *Did John buy?
 c. Did John buy a book?

It seems then that in general CC wh phrases can fulfill subcategorization requirements. But what then can be said about (9a), where even though where occurs as a member of the conjunction of wh phrases the subcategorization of put is not met? (Contrast (9a) with (9b)).

9. a. *Where and when did Bill put the book?
 b. Where did Bill put the book?

The answer to this lies in the nature of conjunctions: the conjunction of a locative phrase with a non-locative (in this case when) is not itself a locative. The conjunction of when and where will thus not meet the subcategorization of put, which requires a locative. Parallel to (9) is (10):

10. a. *Who put the book { where and when } ?
 { when and where }
 (with multiple wh-intonation)
 b. *John put the book { there and then } .
 { then and there }

If two locatives are conjoined however, as in (11), the result is itself a locative, and thus meets the subcategorization of put:

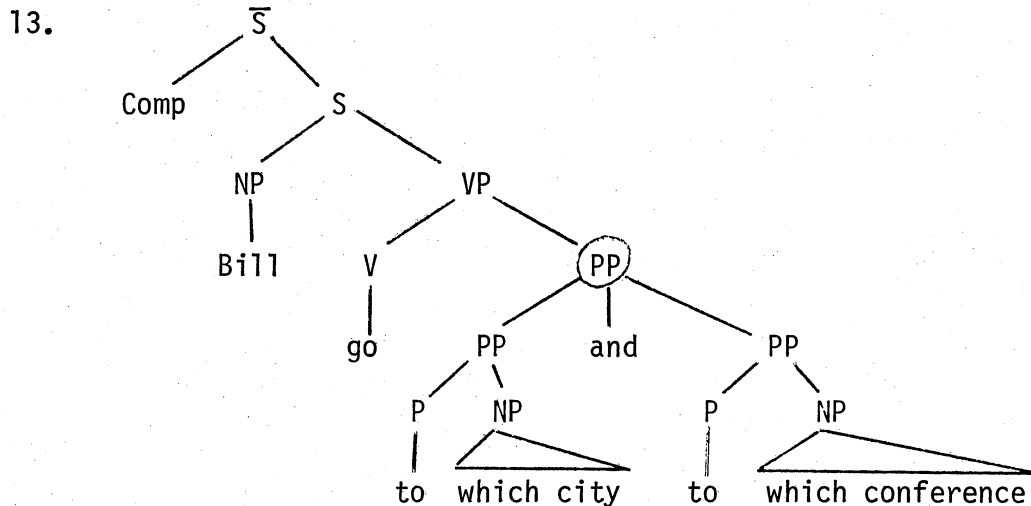
11. On which table and under which flower pot did John put the keys?

The generalization is clear: CC wh phrases will fulfill the subcategorization of a verb if and only if the basic conjunction that is their source fulfills the subcategorization of the verb.

One further prediction is made by the analysis. Consider the case of conjoined PPs exemplified by (11) and (12).

12. To which city and to which conference did Bill go?

According to the analysis defended here, the underlying structure of (12) is (13):



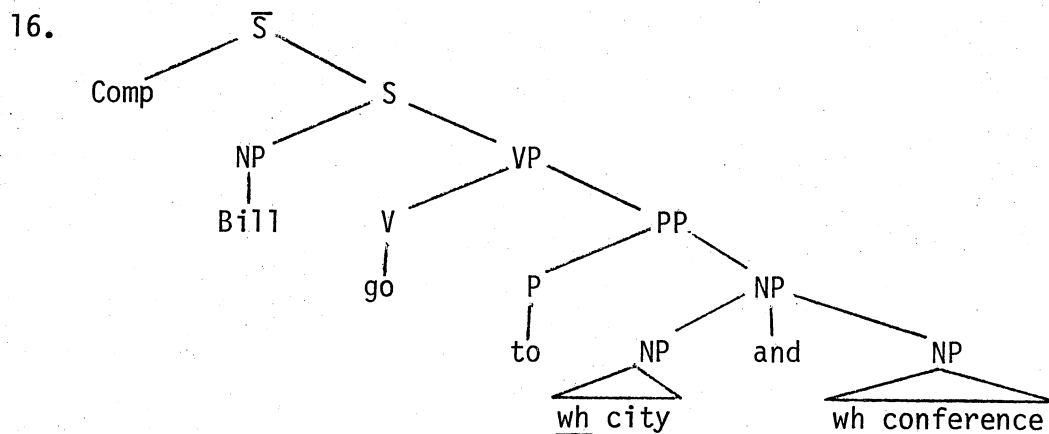
Since it is the circled PP which undergoes wh-fronting, stranding of either or both prepositions should be impossible. The relevant examples are given in (14):

14. a. *Which city and which conference did Bill go to to ?
 b. *Which city and to which conference did Bill go to ?
 c. *To which city and which conference did Bill go to ?

(14) is ungrammatical exactly as predicted. However, variants of (14) are permissible, as (15) shows:

15. a. To which city and which conference did Bill go ?
 b. Which city and which conference did Bill go to ?

But these examples are of course derived not from conjoined PPs as in (13), but from conjoined NPs dominated by PP, as in (16):



When Wh-fronting is applied to this structure it can move either NP or PP, and thus (15a) with pied-piping or (15b) without pied-piping can result.

Once again the analysis makes exactly the right predictions: preposition stranding will be impossible when PPs are conjoined, possible when NPs are conjoined.

Taking all these matters into account, the evidence for the analysis presented here seems to be very strong. Using only independently motivated constraints on conjunctions the analysis explains the observed restrictions on conjoined wh phrases, together with some more subtle facts about subcategorization and pied-piping. The central claim of the analysis is that CC wh phrases are basic conjunctions and thus will exhibit all the properties of conjunctions.

2. Sentence final conjoined wh-words

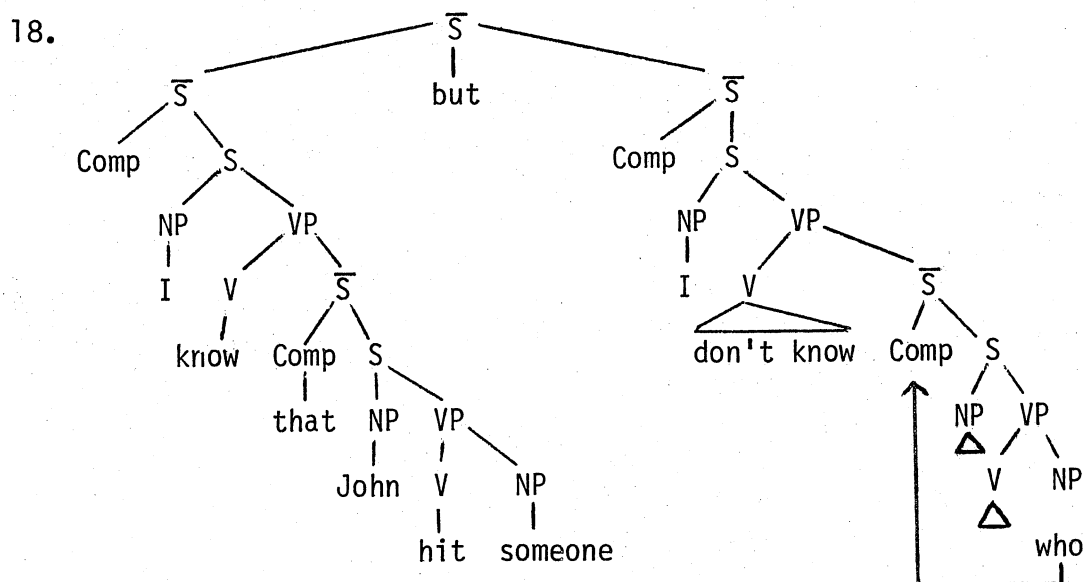
We turn now to the construction exemplified in (2). It will be seen that this construction contrasts sharply with the one just considered, and should be analyzed as a case of Sluicing.

The rule of Sluicing was first proposed by Ross (1969) to account for examples like (17):

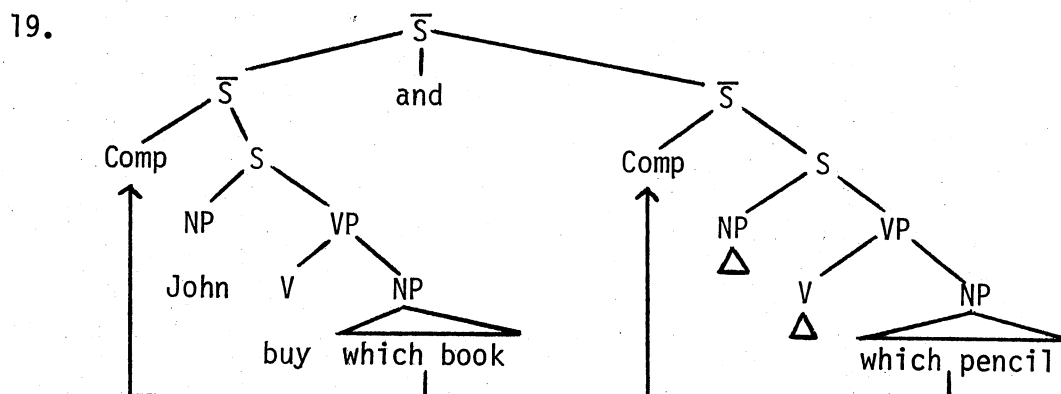
17. I know that John hit someone but I don't know who.

Ross argued that Sluicing should be considered a syntactic rule of deletion, but here I will follow (without defending it), the interpretive analysis outlined in Wasow (1972) and Williams (1976).

In this analysis (17) would be assigned the structure shown in (18), with wh-fronting applying in the circled \bar{S} .



Now it can easily be seen that cases like (2) could be analyzed in exactly the same way:⁴



In this case, wh-fronting applies in each conjunct.

If the examples in (2) have this analysis, then we will expect them to display quite different properties from the examples in (1). First, there is of course no reason to expect that the identical category restriction on CC wh phrases will hold of SFC wh phrases - it holds of CC wh phrases because they are derived from underlying conjunctions and it should not hold of SFC wh phrases if they are derived by Sluicing. Comparing (20) with (4) we see that indeed the identical category requirement does not hold of SFC wh phrases.

20. a. What did John kick and how hard?
b. John asked who Bill had seen and where.

Moreover if the structure given in (19) is correct, then it should be impossible for a SFC wh phrase to fulfil the subcategorization of the verb in the preceding sentence. (21) shows that this prediction is correct:

21. a. *Who bought and what? (direct object missing - required by buy)
b. *Who put the book and where? (locative missing - required by put)

These facts are predicted by the proposed analysis, and illuminate important differences between CC wh phrases and SFC wh phrases. Further evidence for the Sluicing hypothesis is provided by pied-piping. Ross noted an interesting property of pied-piping in sentences derived by Sluicing; this property is illustrated in (22).

22. Bill knows that John went to the movies but he doesn't know who with.

As (22) shows, when an NP is fronted out of a PP, the preposition may be stranded, i.e. left in its original position. This is possible in cases of SFC wh phrases also, hence the grammaticality of (23).

23. a. Where did John go, and who with?
 b. John asked what was sent, and who to.

This similarity between (22) and (23) supports the hypothesis that SFC wh phrases are derived by Sluicing.

3. Browne's surface structure condition

Browne (1972) proposes that CC wh phrases are derived from SFC wh phrases: in this analysis the examples in (1) would be derived from the structures underlying the corresponding examples in (2), presumably by a rule which moves the and plus the wh phrase into the complementizer position occupied by the first wh phrase. This means that the ill-formedness of wh conjunctions in which the syntactic categories of the wh phrases are not the same cannot be attributed to the phrase structure of conjunctions, but must be accounted for in some other way.

Browne suggests a surface structure condition, which he states as follows:

In English, none of the (conjoined JG) question words can be a "bound" part of the sentence; all must be "free" parts..... By "bound" we mean "determined by the distributional characteristics of the verb." (p. 223)

Consider (24) (=Browne's (4) and (6)E) for example:

24. a. *Who and with what broke the glass?
 b. *What and when did he give you?

The claim is that (24a) is ungrammatical because who is one of the conjoined wh words and it is a subject NP and therefore a 'bound' part of the sentence. (24b) is ungrammatical because what is a direct object and so a bound part of the sentence.⁵

This use of the notion 'bound' is dubious in several ways. In general, bound parts of a sentence (such as subject and direct object NPs) can be fronted freely, just like unbound parts of a sentence (such as PPs or AdvPs). Why then should they differ in behaviour with respect to conjunctions? Moreover the definition of 'bound' is rather unclear. It is obviously intended to cover subject NPs and object NPs among other cases; presumably object NPs are included by virtue of subcategorization, while subject NPs (which are not, of course, subcategorized for) are 'bound' because of the general fact that English tensed sentences must have subjects. Rather heterogeneous information is thus involved in determining whether or not a wh phrase counts as a bound part of a sentence.

Even this characterization of 'bound' is empirically inadequate for sentences like (25). (= Browne's (11)E):

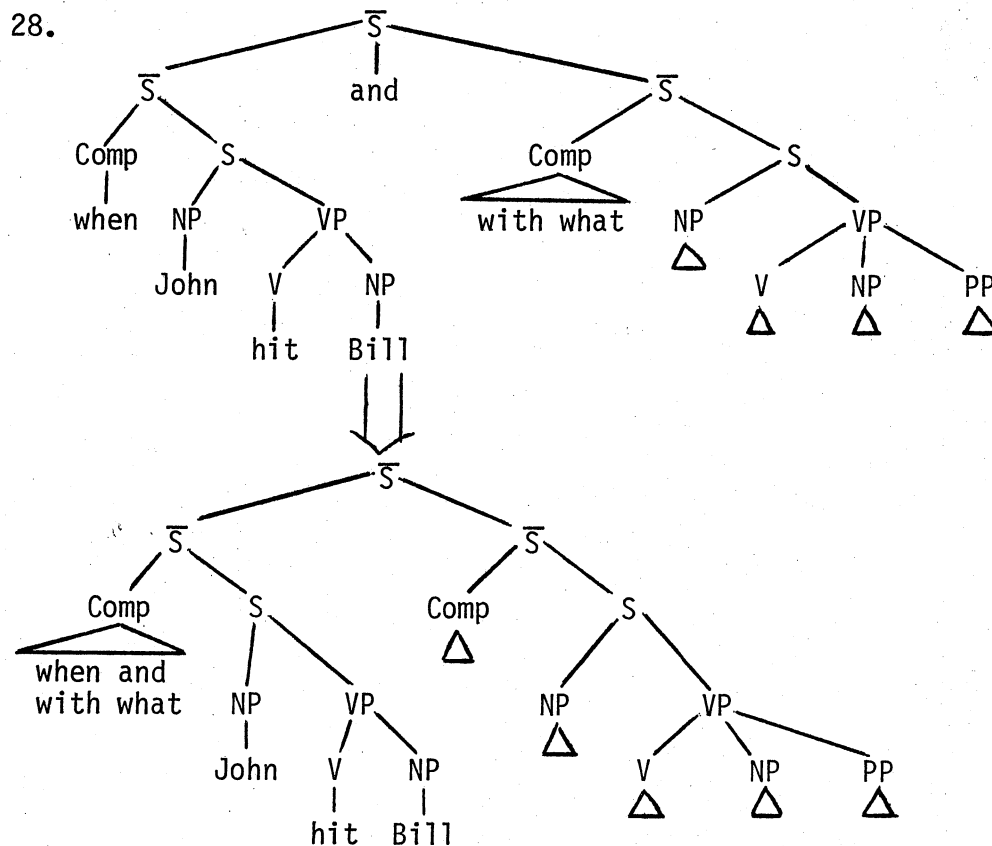
25. *I don't know whether and where you saw them.

Browne says of (25) that it is ungrammatical 'because an indication of affirmativity or negativity is treated as a bound part of a sentence' (p. 224). But whether is obviously not 'bound' according to Browne's definition of the notion. Whether is not required by the distributional properties of the verb see, nor is whether like subject NPs in tensed sentences in being required by the phrase structure of English. If whether counts as a 'bound' part of a sentence, the definition of 'bound' no longer has any empirical content at all. Since in (25) where is not bound any more than whether is, there is really no reason for the sentence to be ill-formed.

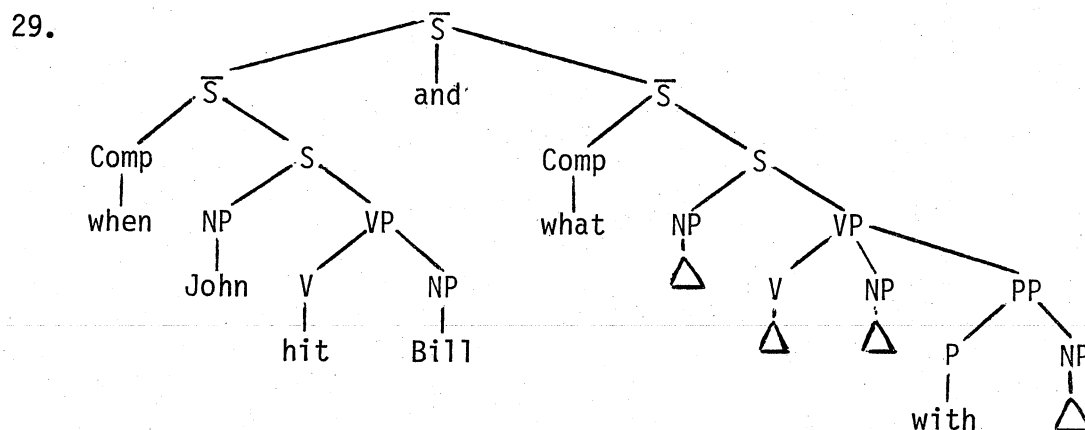
The operation of the transformation relating CC wh phrases and SFC wh phrases also poses some problems. Consider again the optionality of pied-piping in examples like (2). Under Browne's analysis (26) is derived from the structure underlying (27).

26. When and with what did John hit Bill?
27. When did John hit Bill and with what?

The derivation is sketched in (28).



However, suppose pied-piping does not occur in the second conjunct: then, given Wasow's (1972) analysis of Sluicing, (29) will be derived.



But now Browne's rule can apply, giving the ill-formed (30) as output:

30. *When and what did John hit Bill with?

As (30) shows, if the wh word alone is moved into the first complementizer, the result is ungrammatical. There is no obvious way of excluding (30) under Browne's analysis, although the ill-formedness of (30) is not a problem for the underlying conjunction analysis proposed in this paper. It is ill-formed for two reasons: first when is an AdvP, while what is an NP, and therefore the two cannot be conjoined. Second, with is a transitive preposition but has no object NP in underlying structure.

In view of these problems it seems that the analysis proposed by Browne is not a real alternative to the one presented here, in which complementizer conjoined wh phrases are derived from underlying conjunctions of wh phrases and sentence final conjoined wh phrases are cases of Sluicing.

Footnotes

¹I am indebted to the anonymous UMOP reviewers for comments on an earlier version of this paper.

²The wh words when and where conjoin with both AdvPs and PPs, hence:

- (i) When and with what did John hit Bill?
Where and how recently did John get that money?

³The well-formedness of conjunctions may also be affected by semantic conditions; for instance, conjoining a human and a non human NP as in (i) gives a rather strange result.

- (i) ?Bill saw John and a book.
?Who and what did Bill see?

⁴Edwin Williams has pointed out to me that it would in fact be impossible to prevent Sluicing from deriving these examples.

⁵I assume that examples like (1a) are not violations of Browne's surface condition because neither of the wh phrases is itself a bound part of the sentence. It is the NP which dominates the two wh phrases that is the direct object of buy and thus a bound part.

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