Coordinated *Wh*-questions*

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**Abstract:** From a cross-linguistic perspective, Citko and Gracanin-Yuksek (2013) propose that UG allows three structures for coordinated *wh*-questions (CWHs). One is a mono-clausal structure, while the other two structures involve a bi-clausal multi-dominant structure. Liptak (2011), however, argues that an ellipsis strategy is also necessary, in addition to those strategies. This paper focuses on Japanese CWHs, which have not received as much attention in the literature, and investigates which strategy is involved in Japanese. The paper presents three observations on Japanese CWHs. First is that a pronoun which refers to the *wh*-phrase in the first conjunct can possibly appear in the second conjunct. Second, Japanese CWHs do not allow pair-list interpretation, similarly to CWHs in other languages. Third is that possessor *wh*-phrases can be coordinated with possesum *wh*-phrases. Based on these observations, this paper argues that the ellipsis approach proposed in this paper is a more plausible approach to Japanese CWHs than other alternatives.

1. **Introduction**  
The aim of this paper is to investigate the syntactic properties of the coordinated *wh*-questions (henceforth CWHs) given in (1).

(1)  
a. What and why did John eat?  
b. Čto i kogda oni podarili? (Russian)  
   what and when they gave  
   ‘What and when did they give?’ (Gribanova 2009:134)

The construction looks like other multiple-*wh*-questions like *who bought what*, but crucially the two *wh*-phrases, which have a different grammatical function, are coordinated on the surface. From a cross-linguistic perspective, Citko and Gracanin-Yuksek (2013) propose that UG allows three distinct structures for the construction under investigation. One of them is a mono-clausal structure, originally proposed by Zhang (2007) and Haida and Repp (2011), among others. As

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schematically illustrated in (2), each of the wh-phrases is base-generated within a TP, similarly to multiple-wh-questions, and then subsequently undergoes sideward movement into the conjunction phrase.

\[(2) \quad [CP[&P wh_1 \& wh_2] C[TP \ldots t_1 \ldots t_2]]\]

The other structures both involve multi-dominance, as illustrated in (3) (see Citko 2011 for arguments for multi-dominance in syntax).\(^1\) (3a) and (3b) are called a “bulk sharing” structure and a “non-bulk sharing” structure, respectively. In (3a), the coordinated wh-phrases are base-generated within a single TP while the two wh-phrases are base-generated in different clauses in (3b), where the shared elements do not make a constituent.

\[(3) \quad a. \quad \begin{array}{c}
&P \\
&CP & CP \\
&wh_1 & C' & wh_2 & C' \\
&C^0 & C^0 & TP \\
&\ldots t_1 \ldots t_2 \ldots
\end{array}
\]

\[b. \quad \begin{array}{c}
&P \\
&CP & CP \\
&wh_1 & C' & wh_2 & C' \\
&C^0 & TP & C^0 & TP \\
&subj & T' & T' \\
&T^0 & VP & VP \\
&V^0 & t_{wh1} & t_{wh2}
\end{array}\]

In addition to these three structures, Liptak (2011) argues that some CWHs are derived via a backward ellipsis strategy, as illustrated in (4) (see also Tomaszewicz (2011) for an ellipsis approach).

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\(^1\) It is necessary to assume a linearization algorithm which linearizes shared elements in the second conjunct. A detailed discussion of the linearization algorithm is beyond the scope of this paper (see Gracanin-Yuksek 2007 for relevant discussion).
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(4) What did John eat and why did John eat?

In the literature, much attention has been paid to CWHs in the languages which have overt wh-movement (Browne 1972, Gracanin-Yuksek 2007, Gribanova 2009, Citko and Gracanin-Yuksek 2013, Liptak 2011, and Zhang 2007, among others). On the other hand, CWHs in wh-in-situ languages have received little attention, except Whitman (2006), Zhang (2007) and Liptak (2011). Japanese, which is one of the wh-in-situ languages, also allows CWHs; as in (5).

I-TOP who-NOM and what-ACC eat-PAST Q know-not
‘I do not know who and what ate.’

This paper will investigate which type of structure is involved in Japanese CWHs and further argue that ellipsis is involved in Japanese CWHs.

The paper is organized as follows. In section 2-4, the mono-clausal approach, the bulk sharing approach, and the non-bulk sharing approach will be examined respectively, to show that none of them captures Japanese CWHs successfully. Section 5 proposes an ellipsis approach to Japanese CWHs, which solves the empirical problems which the other approaches face. Section 6 concludes the paper.

2. The Mono-Clausal Approach

This section will argue against the mono-clausal approach. Before that, let me introduce Whitman’s (2006) observation, according to which Japanese does not allow CWHs, contrary to (5). The following example comes from Whitman (2006).

(6) * Dare-ga to nani-o yomi-masi-ta ka?
who-NOM and what-ACC read-polite-PAST Q
‘Who and what read?’

It is important to note that the ungrammaticality of (6) has nothing to do with the issue of the (un)availability of CWHs in Japanese, because case-marked phrases cannot be coordinated via the coordinator to, regardless of whether they are wh-phrases or not, as shown in (7a).

Taroo-NOM and Hanako-NOM get-married
‘Taroo got married with Hanako.’
b. OK Taroo-ga odotta, sosite Hanako-ga utatta.
Taroo-NOM danced and Hanako-NOM sang
‘Taroo danced and Hanako sang.’
To is employed for the coordination of non-case-marked phrases. Japanese also has another coordinator **sosite**, which is used for clausal coordination, as shown in (7b). The use of **sosite** in (5) shows that Japanese CWHs involve a bi-clausal structure like (7b). One might say that the monoclusal structure is still defendable based on (7c), which apparently shows that **sosite** is also used for nominal coordination. However, (7c) cannot have the interpretation where Taroo and Hanako got married with each other, which involves true nominal coordination. Rather, (7c) is interpreted as ‘each of them got married with somebody else’, in the same way as the bi-clausal structure in (7d). The use of **sosite**, not **to**, in Japanese suggests that the monoclusal analysis illustrated in (8) is not plausible for Japanese CWHs.

(8) 

\[
\ldots [[\&P \text{dare-ga}_1 \text{sosite nanai-o}_2] \text{t}_1 \text{t}_2 \text{tabe-ta} \text{ka} \ldots .]
\]

The example in (9) is also unexpected under the mono-clausal analysis (see Kazenin 2002 for relevant discussion). In (9), the overt pronoun which refers to **dare-ga** appears in the second conjunct.

(9) 

\[
\text{Watasi-wa} [\text{dare-ga} \text{sosite soitu-ga nani-o} \text{tabe-ta} \text{ka}] \text{siranai.}
\]

I-Top who-NOM and he/she-NOM what-ACC eat-PAST Q know-not

‘I do not know who and what he/she ate.’

3. **The Bulk Sharing Approach**

In this section, let us examine whether the bulk sharing structure approach illustrated in (3a) is plausible for Japanese CWHs. Citko and Gracanin-Yuksek (2013) use the grammaticality of CWHs with two argument **wh**-phrases as one of the diagnostics to explore which structure CWHs have in a particular given language. Argument **wh**-phrases can be coordinated in CWHs in some languages. Romanian is such a language, as illustrated in (10).

(10) 

\[
\text{Cui}_1 \text{ si ce}_2 \text{i}_1\text{-ai dat t}_2 \text{t}_1? \\
to.whom and what to.him-you have given
\]

‘What did you give and to whom?’ (Comorovski 1996:135)

This property is readily expected under the bulk sharing structure (and the mono-clausal structure) because all arguments are base-generated within a single vP. Not every language behaves like Romanian, however. English CWHs, for example, are more restricted with respect to this
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point. As (11a) shows, wh-arguments of obligatory transitive verbs cannot be coordinated in English, contrary to (10). This is unexpected under the bulk sharing structure. According to Citko and Gracanin-Yuksek (2013), English CWHs have a non-bulk sharing structure, where each of the coordinated wh-phrases is base-generated in a different clause. Under this approach, (11a) is excluded in the same way as (11b), where each conjunct misses an argument.

(11) a. * What and (to) whom did John give?
   b. * What did John give and (to) whom did John give?

(Citko and Gracanin-Yuksek 2013:10)

Keeping this in mind, let us consider Japanese CWHs. As (5) and (12) show, any wh-phrases can be freely coordinated in the language.

(12) a. Taroo-wa dare-ni sosite nani-o ageta no?
   Taroo-TOP who-DAT and what-ACC gave Q
   ‘Who and what did Taro give?’
   b. Taroo-wa dare-o sosite naze hihansita no?
   Taroo-TOP who-ACC and why criticized Q
   ‘Who and why did Taro criticize?’
   c. Taroo-wa itu sosite dokode Hanako-ni hajimete atta no?
   Taroo-TOP when and where Hanako-DAT first met Q
   ‘When and where did Taro meet first?’

One might think that a bulk sharing structure is a plausible candidate for Japanese CWHs and propose the following:

(13)

The difference between (3a) and (13) is whether movement takes place in the second conjunct or not. Note that the bulk sharing structure given in (3a) is proposed based on wh-movement languages. The movement of wh-phrases is independently motivated from the bulk sharing structure.
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Japanese is a wh-in-situ language, which does not require *nani*-o to move out of the shared phrase. Recall that shared elements are linearized in the second conjunct. *Nani*-o is linearized in the second conjunct in (13), even if it stays in-situ. In contrast, the wh-phrase in the first conjunct has to move. Otherwise, nothing would be pronounced in the first conjunct. A question arises concerning the nature of the movement taking place in the first conjunct. It is not a wh-movement but rather a scrambling such as (14), which is widely observed in Japanese.

(14)   | Ringo-ɔ₁ Taroo-ɡa t₁ tabeta.  |
       | apple-ACC Taroo-NOM eat-PAST  |
       | ‘Apples, Taroo ate t₁.’ |

There are three problems with the structure given in (13). First, recall the observation in (9) that the overt pronoun can optionally appear in the second conjunct. One might say that the grammaticality of (9) is captured by saying that the trace of *dare*-ga is realized as the resumptive pronoun *soitu*-ga. However, this possibility is not workable because clause-internal scrambling in Japanese does not leave a resumptive pronoun in the first place, as shown in (15).

(15)   | * Dare-ɔ₁ John-ɡa soitu-ɔ₁ hihanshita no?  |
       | what-ACC John-NOM he/she-ACC criticized Q  |
       | ‘Who did John criticize?’ |

The second argument comes from the unavailability of pair-list (PL) interpretation in CWHs. As discussed in Gribanova (2009), among others, CWHs do not allow PL interpretation, making a single pair interpretation the only available option.

(16)   | Kto i kakoj gorod zaxvatil?  |
       | who-NOM and which-ACC city-ACC conquered.3SG  |
       | ‘Who conquered which city?’ (Gribanova 2009:133) |

(16) allows only a single pair (SP) reading. “The Germans conquered Paris” is a possible answer for (16). Let us turn to Japanese CWHs.

(17)   a.   | Dare-ɡa dare-da ka wakaranai. (PL interpretation only)  |
       | who-NOM who-COP Q know-not  |
       | ‘(I) do not know who is who.’ |

b.   | * Dare-ɡa sosite dare-da ka wakaranai.  |
       | who-NOM and who-COP Q know-not  |
       | ‘(I) do not know who and is who.’ |

Generally speaking, Japanese multiple wh-questions can have an SP reading and a PL reading but *who-is-who* type questions such as (17a) only allow PL interpretation. SP interpretation is not
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available. For example, (17a) can be uttered under the context where the speaker of (17a), who has not been in touch with any his classmate for long time since graduation, has attended a junior high school reunion. Crucially, (17b), a CWH counterpart of (17a), is ungrammatical, which suggests that the only available interpretation for a who-is-who type question (PL interpretation) is blocked in (17b). In other words, Japanese CWHs also disallow PL interpretation.

Following Gribanova (2009) and Citko and Gracanin-Yuksek (2013), let us adopt Quantifier Absorption as the mechanism of how to obtain a PL interpretation. Quantifier Absorption turns one or more quantifiers into one binary (or n-ary) quantifier at LF (see Higginbotham and May 1981). Under the bulk sharing structure illustrated in (3a), one of the wh-phrases has to be absorbed into the other one across the conjunct to obtain a PL interpretation. Citko and Gracanin-Yuksek (2013) claim that the unavailability of the PL interpretation in CWHs is derived from the violation of the Coordinate Structure Constraint (CSC).

This explanation cannot be extended to Japanese CWHs under the bulk sharing approach. Let us see the derivation of the embedded clause of (17b), where the second wh-phrase stays in-situ. Nothing prevents Quantifier Absorption from taking place because the two wh-phrases are in the same conjunct. Thus, the analysis based on the bulk sharing structure wrongly expects that PL interpretation would be available.

\[
\text{(18)}
\]

Third, the bulk sharing approach fails to predict the grammaticality of (19).

\[
\text{(19)}
\]

As illustrated in (20), dare-no and nani-o make a complex noun phrase. Then dare-no is scrambled to [Spec, CP] in the first conjunct. Taro-ga also undergoes scrambling across dare-no.
Note that the movement of *dare-no* out of the complex noun phrase involves a violation of the Left Branch Condition (LBC). As illustrated in (21), Japanese scrambling obeys the LBC. It is wrongly expected that (19) would be excluded by the LBC.

(21) * Hanako-no1 John-ga [ t1 kaban]-o kakusita.
    Hanako-GEN John-NOM bag-ACC hid
    'Hanako's John hid t1 bag.' (Kato 2007:109)

4. The Non-Bulk Sharing Structure
In this section, let us examine whether the other multi-dominant structure, that is, the non-bulk sharing structure like (22) solves three problems which the bulk sharing structure analysis faces. Under the non-bulk sharing structure, the embedded clause of (5) would be analyzed as (22).
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The first issue concerning the grammaticality of (9) is readily explained by saying that pro in the second conjunct is replaced by the overt pronoun soitu-ga. Second, the absence of PL interpretation in CWHs, as shown in (17b), is also captured. Under the non-bulk sharing structure, two wh-phrases are in different conjuncts in the course of the derivation and thus Quantifier Absorption is blocked by the CSC. Let us also consider the third problem concerning the grammaticality of (19). On the assumption with Fukui and Takano (1998) that a case particle heads its own projection KP, (19) would involve sharing of a case particle, as illustrated in (23).

(23)  

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(23)  

It is also assumed that the first wh-phrase dare-no involves pro as the head of the noun phrase. As shown in (24), in Japanese the head of a noun phrase does not have to be overtly realized if it is preceded by a possessor. In (24), pro is postulated as a head noun.

(24)  

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However, the case sharing strategy employed in (23) cannot be extended to the following example, where dare-no-o is involved in the second conjunct:

(25)  

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As shown in (25), the case particle in the first conjunct cannot be omitted. If the case sharing strategy employed in (23) were available, the accusative case could be omitted through the case sharing strategy illustrated in (26), contrary to fact.

(26)  

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The next section will argue that an ellipsis approach captures the contrast in (19) and (25).
5. An Ellipsis Approach

In this section, an ellipsis approach is explored. Let us first consider how much of the structure is coordinated. As the first trial, let us make the assumption that CP-level coordination is involved in Japanese CWHs. (5) would be analyzed in (27), where CP undergoes ellipsis after dare-ga is scrambled.

(27) Watasi-wa [(dare-ga₁ [CP pro₃ tabeta ka]) sosite [CP pro₁ nani-o tabeta ka]] siranai.

However, there is a problem with this assumption. It is unclear why the relevant ellipsis cannot take place in a forward way, as illustrated in (28a). It is wrongly expected that (28b) would be grammatical.

(28) a. Watasi-wa [(dare-ga₁ pro tabeta ka) sosite [nani-o₂ [CP pro₁ t₂ tabeta ka]] siranai.
   b. * Watasi-wa dare-ga₁ pro tabeta ka sosite nani-o siranai.

Let us consider another possibility that vP coordination is involved, as shown in (29), where T and C are outside of the coordinate structure, with the assumption that Japanese subjects can stay in-situ (Fukui 1986).


As illustrated in (30), dare-ga undergoes movement, followed by adjoining to the vP, and finally the lower vP is deleted.


The analysis given in (30) does not suffer from the directionality problem of ellipsis, which the CP-coordination analysis given in (28) faces. If ellipsis took place in a forward way as illustrated in (31), the past tense morpheme ta would be left behind as a result of ellipsis, which violates the morphological requirement that the past tense morpheme ta should be adjacent to a verb.


The relevant morphological requirement is independently motivated by (32), where ta is stranded by VP-fronting.

(32) * [Ringo-o tabe]₁ Taroo-ga t₁ ta.
    apple-ACC eat Taroo-NOM PAST
    ‘Eat apples’, Taroo did t₁.’
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Let us examine how the proposed ellipsis analysis captures the contrast between (19) and (25), which is problematic for the non-bulk sharing analysis. First, let us consider the ungrammaticality of (25), which is repeated as (33a). As shown in (33b), in order for the accusative case particle to be omitted, *nani* moves, leaving behind the case particle *o*, which is followed by VP-ellipsis taking place in the first conjunct. The case particle heads its own projection KP in (33b).

(33)  
\[\text{a. Taroo-ga nani-y(o) sosite dare-no-o nusun-da no?} \]
\[\text{b. * Taroo-ga [VP [NP nani] \{VP [NP t-o nusumi]\}] sosite [VP dare-no-o nusun]-da} \]

One might raise a question as to why stranding a case particle is prohibited. Extending the suggestion that nominals are also phases (Chomsky 2004), let us assume that KP, which is the top node of a nominal phrase, is a phase. Abels (2003) proposes the generalization that the complement of a phase head cannot undergo movement. For example, the ungrammaticality of (34), where TP undergoes movement, falls under this generalization.

(34)  
\[\text{* [John is a fool]_1, Mary told herself that t}_1.\]

Since *nani* is a complement of the phase head K, *nani* fails to undergo movement in (33b) in the same way as (34). Next, let us consider (19). (35a), where *pro* is the head of the noun phrase, is an underlying structure for (19).

(35)  
\[\text{Taroo-TOP who-GEN-pro-ACC steal and what-ACC steal PAST Q ‘What and whose did Taro steal?’} \]
\[\text{b. Taroo-ga [KP [NP dare-no]_1] sosite [VP nani-o nusun]-da no?} \]

As discussed in (33), the complement of K cannot be moved. Thus, *dare-no pro* cannot move. However, (35a) has another option of movement. As shown in (35b), *dare-no* moves out of the ellipsis site, leaving behind *pro*. Under this option, the head noun *pro* and the case particle is stranded in the ellipsis site. This movement is legitimate in terms of Abels’ generalization, because the moved phrase is not a complement of the phase head. It is true that the movement in question violates the LBC, but LBC violation can be repaired by ellipsis, as shown in (36).

(36)  
\[\text{He wants a detailed list, but I don’t know how detailed, [he wants t}_1\text{-list].} \]
\[\text{(Merchant 2001:167)} \]

The violation of the LBC in (35b) is also repaired by ellipsis and the grammaticality of (35b) is correctly expected under the ellipsis approach. Also, the grammaticality of (9) and the ungrammaticality of (17b) are captured under the ellipsis approach in the same way as the non-bulk
sharing approach. It is thus possible to conclude that the proposed ellipsis approach is the most plausible for Japanese CWHs.

6. Summary
This paper has presented three novel observations on Japanese CWHs. First is that a pronoun which refers to the wh-phrase in the first conjunct can possibly appear in the second conjunct. Second, Japanese CWHs do not allow pair-list interpretation, like CWHs. Third, possessor wh-phrases can be coordinated with possessum wh-phrases. Based on these observations, the paper has argued that the proposed ellipsis approach is the most plausible approach for Japanese CWHs.

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