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 possessum *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
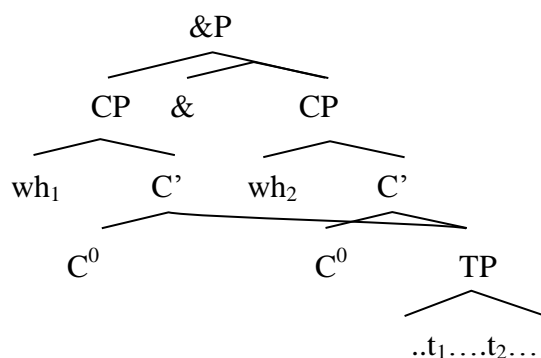
schematically illustrated in (2), each of the *wh*-phrases is base-generated within a TP, similarly to multiple-*wh*-questions, and then subsequently undergoes sideward movement into the conjunction phrase.
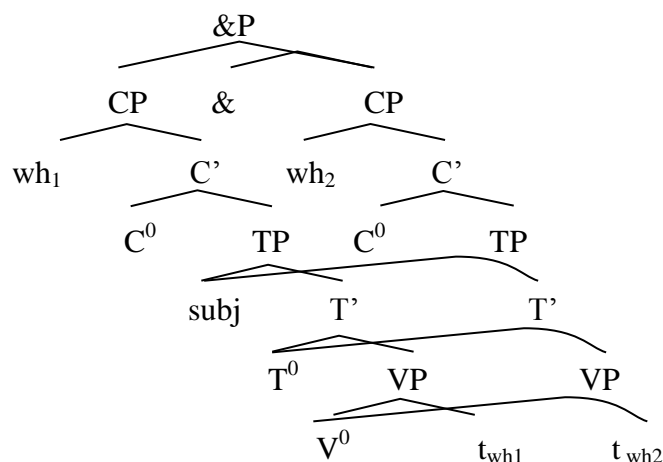
(2) $[_{CP}[_{\&P}$ wh$_1$ & wh$_2$] C $[_{TP}$ ….t$_1$ …. t$_2$]]$

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)   a.

&P: [CP [wh$_1$, C' [C^0]] & CP [wh$_2$, C' [C^0, TP [..t$_1$….t$_2$…]]]]

b.

&P: [CP [wh$_1$, C' [C^0, TP [subj, T' [T^0, VP [V^0]]]]] & CP [wh$_2$, C' [C^0, TP [T' [VP [t$_{wh1}$, t$_{wh2}$]]]]]]

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).

(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).

(5)   Watasi-wa [dare-ga   sosite nani-o   tabe-ta   ka] siranai.
             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).

(7)   a.   * Taroo-(*ga) to   Hanako-ga kekkonsita.
                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.'

c. ^{OK} Taroo-ga sosite Hanako-ga kekkonsita.
    Taroo-NOM and   Hanako-NOM get-married
    'Taroo got married and Hanako got married.'

d. ^{OK} Taroo-ga kekkonsita sosite Hanako-ga   kekkonsita.
    Taroo-NOM get-married and   Hanako-NOM get-married
    'Taroo got married and Hanako got married.'

To is employed for the coordination of non-case-marked phrases. Japanese also has another co-ordinator *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 mono-clausal 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 mono-clausal analysis illustrated in (8) is not plausible for Japanese CWHs.

(8)   ⋯..[[$_{\&P}$ dare-ga$_1$ sosite nanai-o$_2$] t$_1$ t$_2$ tabe-ta ka⋯...

        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)   Watasi-wa [dare-ga sosite soitu-ga   nani-o tabe-ta ka] 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)   Cui$_1$ şi ce$_2$ i$_1$-ai   dat t$_2$ 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 struc-ture) because all arguments are base-generated within a single *v*P. Not every language behaves like Romanian, however. English CWHs, for example, are more restricted with respect to this

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?

<div align="right">(Citko and Gracanin-Yuksek 2013:10)</div>

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
          'Whom 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)
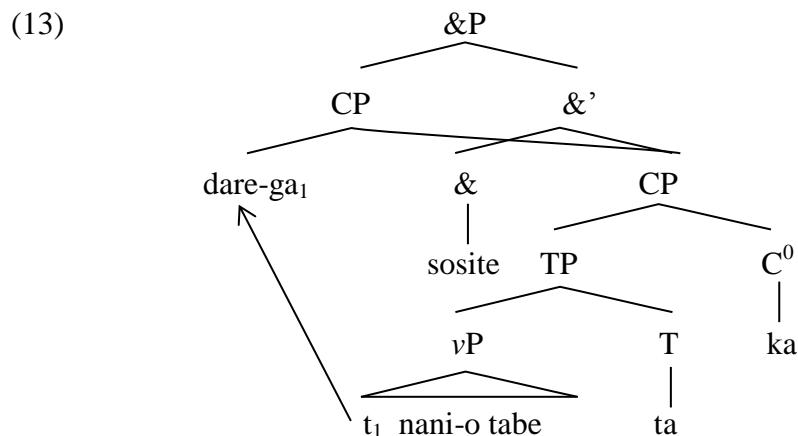
The difference between (3a) and (13) is whether movement takes place in the second conjunct or not. Note that the bulk sharing structure given in (3a) is proposed based on *wh*-movement languages. The movement of *wh*-phrases is independently motivated from the bulk sharing structure

itself. 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-o$_1$ Taroo-ga t$_1$ tabeta.
          apple-ACC Taroo-NOM   eat-PAST
          'Apples$_1$ Taroo ate t$_1$.'

        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-o$_1$ John-ga   soitu-o$_1$ 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-ga dare-da   ka wakaranai. (PL interpretation only)
            who-NOM who-COP   Q   know-not
            '(I) do not know who is who.'
      b. * Dare-ga 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

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.
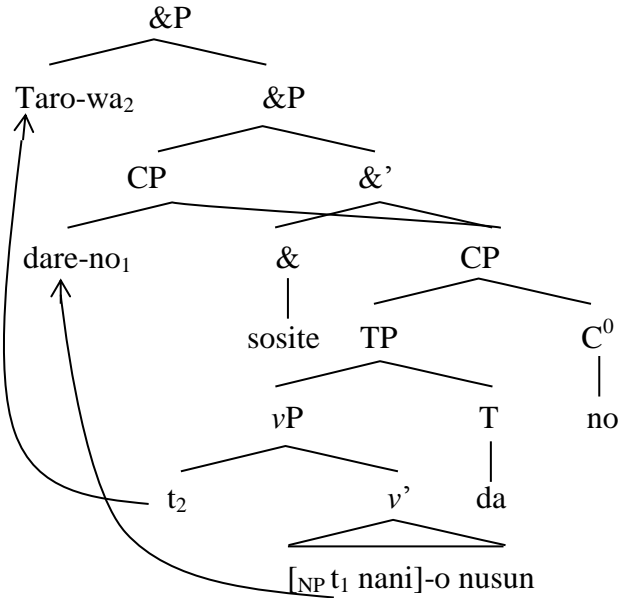
(18)
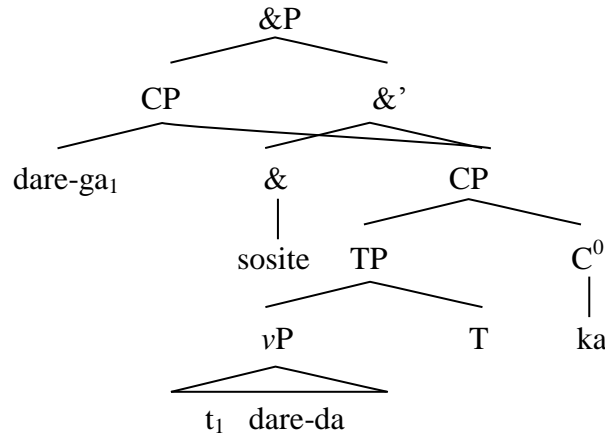
Third, the bulk sharing approach fails to predict the grammaticality of (19).

(19)   Taro-wa dare-no sosite nani-o   nusun-da no?
        Taro-TOP   who-GEN   and   what-ACC steal-PAST   Q
        'Whose and what did Taro steal?'

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*.

(20)

&P
- Taro-wa$_2$
- &P
  - CP
    - dare-no$_1$
  - &'
    - &
      - sosite
    - CP
      - TP
        - vP
          - t$_2$
          - v'
            - [$_{NP}$ t$_1$ nani]-o nusun
        - T
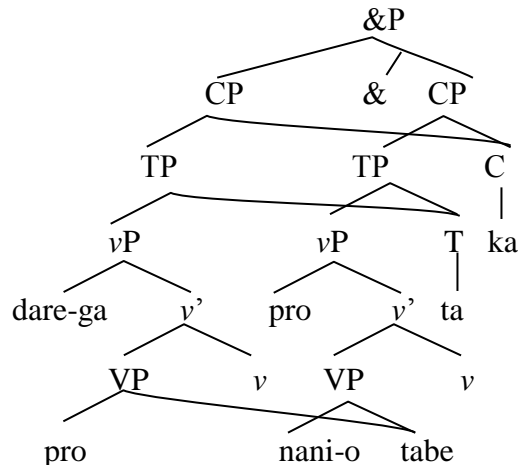   - da
      - C^0
        - no

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-no$_1$ John-ga [t$_1$ kaban]-o kakusita.
         Hanako-GEN   John-NOM   bag-ACC   hid
         'Hanako's$_1$ John hid t$_1$ 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).
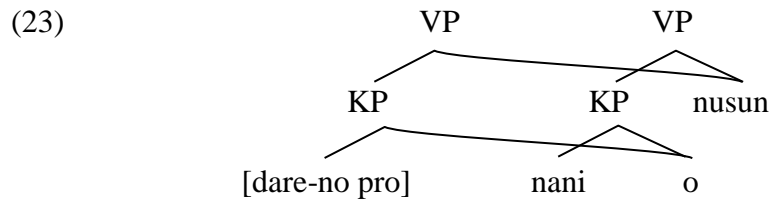
(22)

&P
- CP
  - TP
    - vP
      - dare-ga
      - v'
        - VP
          - pro
          - nani-o tabe
        - v
- &
- CP
  - TP
    - vP
      - pro
      - v'
        - VP
        - v
    - T
      - ta
  - C
    - ka

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)

```
                    VP            VP
                   /  \          /  \
                KP    KP    nusun
               / \    / \
        [dare-no pro]  nani   o
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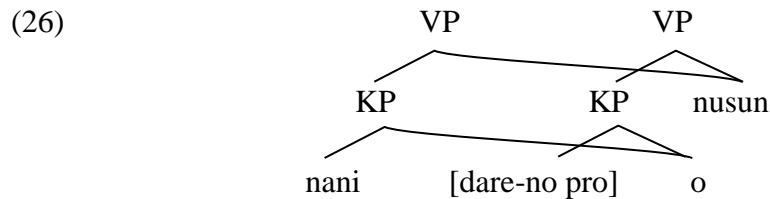
It is also assumed that the first *wh*-phrase *dare-no* involves *pro* as the head of the noun phrase. As shown in (24), in Japanese the head of a noun phrase does not have to be overtly realized if it is preceded by a possessor. In (24), *pro* is postulated as a head noun.

(24)   Taroo-ga   [dare-no pro]-o nusun-da no?
          Taroo-NOM   who-GEN-ACC   steal-PAST Q
          'Whose did Taroo steal?'

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)   Taroo-ga nani-*(o) sosite dare-no-o   nusun-da no?
          Taro-NOM what-ACC   and   who-GEN-ACC steal-PAST Q
          'What and whose did Taro steal?'

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)

```
                    VP            VP
                   /  \          /  \
                KP    KP    nusun
               / \    / \
            nani  [dare-no pro]   o
```

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-ga$_1$ [$_{CP}$ t$_1$ pro tabeta ka]] sosite [$_{CP}$ pro$_1$ 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-ga$_1$ pro tabeta ka] sosite [nani-o$_2$ [$_{CP}$ pro$_1$ t$_2$ tabeta ka]] siranai.
         b. * Watasi-wa dare-ga$_1$ pro tabeta ka sosite nani-o siranai.

Let us consider another possibility that *v*P 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).

(29)   Watasi-wa [$_{CP}$ [$_{\&P}$ [$_{vP}$ dare-ga pro tabe] sosite [$_{vP}$ pro$_1$ nani-o tabe]] ta ka] siranai.

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

(30)   Watasi-wa [$_{CP}$ [$_{TP}$ [$_{\&P}$ [$_{vP}$ dare-ga$_1$ [$_{vP}$ t$_1$ pro tabe]] sosite
                             [$_{vP}$ nani-o$_2$ [$_{vP}$ pro$_1$ t$_2$ tabe]]] ta] ka] siranai.

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.

(31)   Watasi-wa [$_{CP}$ [$_{TP}$ [$_{\&P}$ [$_{vP}$ dare-ga$_1$ [$_{vP}$ t$_1$ pro tabe]] sosite
                             [$_{vP}$ nani-o$_2$ [$_{vP}$ pro$_1$ t$_2$ tabe]]] ta] ka] siranai.

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

(32)   *   [Ringo-o   tabe]$_1$ Taroo-ga t$_1$ ta.
              apple-ACC eat   Taroo-NOM   PAST
             '[Eat apples]$_1$, Taroo did t$_1$.'

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) a. Taroo-ga nani-*(o) sosite dare-no-o nusun-da no?
      b. * Taroo-ga [$_{VP}$ [$_{NP}$ nani]$_1$ ~~[$_{VP}$ [$_{KP}$ t$_1$ -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)   * [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) a. Taroo-ga [[$_{KP}$[$_{NP}$ dare-no-pro]-o] nusumi] sosite [nani-o nusun] da no?
          Taroo-TOP   who-GEN-pro-ACC steal   and   what-ACC steal   PAST Q
          'What and whose did Taro steal?'
      b. Taroo-ga [$_{\&P}$ [$_{VP}$ [dare-no$_1$] ~~[$_{VP}$ [$_{KP}$ [$_{NP}$ t$_1$ pro]-o] nusumi]~~] 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)   He wants a detailed list, but I don't know how detailed$_1$ ~~[he wants t$_1$ list]~~.
                                                                    (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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