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Multiple Wh-interpretations

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1 Observations and Generalizations

1.1 Illusory Wh-Effects in Japanese

It probably is no exaggeration to say that there is growing concern in the field of Japanese syntax that many important and influential works on island effects in the past might not have been based upon precise empirical observations. For instance, Deguchi and Kitagawa (2002) and Ishihara (2002) challenged the claim that Wh-in-situ in Japanese exhibits Subjacency effects. Deguchi and Kitagawa pointed out: (i) that Wh-questions in Japanese are accompanied by **Emphatic Prosody** (henceforth **EPD**), which consists of an emphatic accent on the focused Wh-phrase followed by deaccenting of all lexical accents up to some COMP, and (ii) that the [+WH] CP at which EPD ends coincides with the scope domain of a Wh-phrase.[1] They reexamined many relevant examples, assigning two patterns of EPD, as in (1).[2]

(1) a. #[$_{CP1}$ John-wa [$_{CP2}$ Mary-ga **NA**'ni-o ↓ta'beta-**kado'oka**↓]
John-TOP Mary-NOM what-ACC ate-COMP$_{\mathbf{WHETHER}}$

I'mademo siritaga'tteiru-no↑]
even.now want.to.know-Q

'Lit: Does John still want to know [**whether** Mary ate **what**]?

b. [$_{CP1}$ John-wa [$_{CP2}$ Mary-ga **NA**'ni-o ↓ta'beta-*kado'oka*]
what-ACC -COMP$_{\mathbf{WHETHER}}$

i'mademo siritaga'tteiru↓-**no**↑]
-COMP$_{\mathbf{WH}}$

' Lit: **What$_1$** does John still want to know [**whether** Mary ate **t**$_1$]?'

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[1] This correlation may not necessarily hold when a certain type of presupposition is involved, which we will not discuss in this work.

[2] In our examples, an emphatic accent is indicated by **X**'x, deaccented strings by ↓x'x↓, and retention of a lexical accent by *X*'x. # placed on a sentence means that it is unacceptable with the indicated prosody.

In (1a), the sentence is accompanied by Short EPD, which requires the subordinate scope interpretation of the involved Wh-in-situ. The subordinate CP, however, is headed by *-kadooka*, which functions only as -COMP$_{\textbf{WHETHER}}$ for most speakers.[3] The subordinate CP therefore lacks any appropriate Wh-scope marker and the sentence is expected to be awkward. It was pointed out that this awkwardness is what has been recognized in the literature as Subjacency effects. Even more importantly, when the same sentence is accompanied by Long EPD as in (1b), it clearly permits a matrix scope interpretation of the embedded Wh-in-situ. With appropriate prosody, in other words, no Subjacency effects are observed in Japanese. Judgments of Subjacency effects in Japanese seem to have arisen from the misinterpretation of prosody-scope relations.

Deguchi and Kitagawa (2002) also cast doubt on the validity of the so-called Additional-Wh effect reported on a multiple-Wh-question like (2).

(2) John-wa [Mary-ga **NA**'ni-o ↓katta-kado'oka] **DA**'re-ni↓tazu'neta↓↓ -no
John-TOP Mary-NOM what-ACC bought-COMP$_{\textbf{WHETHER}}$ who-DAT asked-COMP$_{\textbf{WH}}$

'**What**$_1$ did John ask **whom** [*whether* Mary bought **t**$_1$]?'

It has been claimed that the allegedly expected Subjacency violation in (2) is ameliorated because of the addition of an extra Wh-phrase (***DA**'re-ni* 'who-DAT') outside the Wh-island (A. Watanabe (1992: 263)), and the sentence comes to yield a matrix multiple-Wh-question. Deguchi and Kitagawa (2002) point out, first, that multiple questions in Japanese generally are accompanied by a prosodic pattern they call "**Complex EPD**," in which one instance of EPD starts in the middle of another EPD. Then, both EPDs end at the same COMP, and the two Wh-phrases exhibit synchronized scope. As a multiple-Wh-question involving synchronized matrix scope, (2) must be also accompanied by a "long" instance of such Complex EPD, as indicated. (We will represent Complex EPD by nesting one box into another, indicating the nesting relations of two instances of EPD.) Crucially then, when "Long Complex EPD" is properly assigned as in (3), even the multiple Wh-phrases **within an island** can be interpreted as a **matrix** multiple-Wh-question.

(3) John-wa [***DA**'re*-ga ↓**NA**'ni-o ↓katta-***kado'oka***] to'm-ni tazu'neta↓↓ -no
who-NOM what-ACC -COMP$_{\textbf{WHETHER}}$ Tom-DAT -COMP$_{\textbf{WH}}$

'**What**$_1$ did John ask Tom [*whether* **who** bought **t**$_1$]?'

[3] See Deguchi and Kitagawa (2002) for discussion on the idiolectal variation in the use of *-kadooka*.

The Additional-Wh effect in Japanese, in other words, also seems to arise from the misinterpretation of prosody-scope relations in multiple-Wh questions.

1.2 Multiple-pair Interpretations

Another property of multiple-Wh-questions in Japanese relevant to us is that they can generally provide two distinct types of pair-wise interpretations (Miyagawa (1997), Boskovic (1998)). For instance, the question in (4A) can be asked to request an answer identifying multiple pairs as in (4B) or a single pair as in (4B').

(4) A. John-wa **DA**'re-ni ↓**NA**'ni-o ↓maka'seta↓↓-no↑?
John-TOP who-DAT what-ACC entrusted -COMP$_{WH}$

'Who did John entrust with what ?'

B. **Tom**-ni-wa **renraku**-o, **Bill**-ni-wa **kaimono**-o,
Tom-DAT-TOP contact-ACC Bill-DAT-TOP shopping-ACC

Jim-ni-wa **soozi**-o makaseta-rasii
Jim-DAT-TOP contact-ACC entrusted-seem

'It seems that he asked Tom to call around, Bill to do shopping and Jim to clean up the place."

B'. **Tom**-ni **renraku**-o makaseta-rasii
Tom-DAT contact-ACC entrusted-seem

'It seems that he asked Tom to call around.'

Thus, phonetically, multiple-Wh-questions in Japanese are accompanied by Complex EPD, and semantically they can yield two distinct types of pair-wise interpretations — a multiple-pair (or "pair-list") interpretation and a single-pair interpretation. As in the case of single Wh-questions, the two factors intersect — the domain of Complex EPD and the scope of a Wh-pair coincide.

Before turning to our main observations and proposals, we would like to establish a diagnostic test for detecting multiple-pair interpretations since their examination would require special caution, which seems to be exercised quite rarely in the literature. First, whether a multiple-Wh-question exhibits a multiple- or single-pair interpretation has been often determined based upon the way it is answered. Answerhood, however, is not a very reliable diagnostics. For instance, a discourse as in (5) has been presented in the literature as a case indicating that a multiple-pair interpretation is possible with the question involving a definite NP as in (5A) (Pritchett (1990)).

(5) A: { **What** / Which **movies** } did the boys rent last night?
B: **The boys** rented **'Casablanca' and 'Titanic'**.
B': **John** rented **'Casablanca'** and **Bill** rented **'Titanic'**.

The felicity of the answer (5B') gives us the impression that the question in (5A) is asking about multiple-pairs. Krifka (1992) and Srivastav Dayal (1992) argue, however, that the answer in (5B') is a "cooperative answer," which does not necessarily reflect a genuine multiple-pair interpretation of the question. The possibility of a cooperative answer can be eliminated if we alter the question (5A) with the use of a singular Wh-phrase as in (6A). (?# indicates infelicity.)

(6) A: Which **movie** did the boys rent last night?
B: **?#John** rented **'Casablanca'** and **Bill** rented **'Titanic'**.

Cooperative answers, though controllable, have taught us the danger of relying solely on our intuition of answerhood in detecting multiple-pair readings. We believe that what we call "list" verbs, which were originally discussed by Schwarz (1995), provide us with an appropriate device to identify the presence of multiple-pair interpretations without relying on answerhood. List verbs semantically select Wh-questions which presuppose plurality of answers. Such verbs include *list*, *enumerate* and *rattle off*. The paradigm in (7) demonstrates that while a Wh-question with a singular Wh-phrase cannot be embedded with a list verb, any of a plural Wh, a number-neutral Wh or multiple singular Whs is compatible with such a verb.

(7) a. He *listed* [{which **students** / **who** / *which **student**} left early].
b. He *listed* [**which** student greeted **which** professor].

The acceptability of (7b) indicates that the plurality in the embedded clause stems from the involvement of multiple pairs. This way, we can confidently detect a genuine multiple-pair interpretation, based on our grammaticality judgment.

Since Japanese nominals are neutral with respect to number, it is impossible to completely dissociate plurality from a Wh-phrase by controlling its head nominal. We can still eliminate pseudo multiple-pair interpretations in Japanese, however, by choosing a predicate that is pragmatically incompatible with pluralities. For example, an expression like 'a ball club selecting a player as No.1 draft pick' necessarily requires a pair of singular entities. We can thus force the involved nominals to be interpreted as singular in effect. As a result, when a list verb successfully selects a multiple-Wh-question as in (8), we can be sure that a genuine multiple-pair interpretation is involved there.

(8) [dono-kyuudan-ga dono-yuuboosensyu-o
which-ball.club-NOM which-promising.player-ACC

dorahuto-de **itii-simeesuru**-ka] ***risuto-ni-site***-mimasyoo
draft-at **pick.as.No.1**-COMP$_{WH}$ ***make.a.list***-let.us

'Let's list which ball club will select which promising player as No. 1 draft pick.'

1.3 Masked Wh-Effects in Japanese

We are now ready to present our main observations. First, when multiple Wh-phrases are embedded in a non-island (headed by *-to* 'that') and their pairwise scope is interpreted under the matrix CP as in (9a), the sentence may exhibit either single- or multiple-pair interpretation. (In this section, we will represent Complex EPD only with its emphatic accents (**X**'x) and the last portion of Eradication (↓x'x↓) for simplicity.)

(9) a. Supo-Niti-wa [**DO**'no-kyuudan-ga **DO**'no-yuuboo-sensyu-o
Japan-Sports-TOP which-ball.club-NOM which-promising-player-ACC

↓itii-si'mee-siyooto-siteiru-***to***] kanga'eteiru↓-no↑?
intend.to.select.as.No.1-***that*** think-COMP$_{WH}$

'Which ball club does Sports Nippon think will select which promising player as No. 1 draft pick?'

b. Supo-Niti-wa [**DO**'no-kyuudan-ga **DO**'no-yuuboo-sensyu-o
Japan-Sports-TOP which-ball.club-NOM which-promising-player-ACC

↓itii-si'mee-siyooto-siteiru-***kado'oka***] siritaga'tteiru↓-no↑?
intend.to.select.as.No.1-***whether*** want.to.know-COMP$_{WH}$

'With respect to which ball club does Sports Nippon want to know if it will select which promising player as No. 1 draft pick?'

When the same Wh-phrases are embedded in a Wh-island (headed by *-kado'oka* 'whether') as in (9b), however, a mysterious interpretive restriction arises. The sentence can still exhibit a single-pair interpretation but does not seem to permit a multiple-pair interpretation. The question therefore can be interpreted as seeking the identity of only a single pair of a ball club and a promising player. We are witnessing here, in other words, a type of island effects which shows up only interpretively while the sentence is still permitting the matrix scope interpretation out of a Wh-island. Taking this property into consideration, let us refer to this phenomenon as the "**Masked Island Effect**."

The Masked Island Effect can be further confirmed when we attempt to let questions like (9a-b) be selected by a list verb as in (10a-b).

(10) a. [Supo-Niti-ga-desune, [**DO**'no-kyuudan-ga **DO**'no-yuuboo-sensyu-o
Japan-Sports-NOM which-ball.club-NOM which-promising-player-ACC

↓itii-simee-siyooto-siteiru-***to***] kangaeteiru-ka↓] ***risuto-ni-site***-mimasyoo
intend.to.select.as.No.1-**that** think-$COMP_{WH}$ ***make.a.list***-let.us

'Let's list which ball club Sports Nippon thinks will select which promising player as No. 1 draft pick.'

b. #[Supo-Niti-ga-desune, [**DO**'no-kyuudan-ga **DO**'no-yuuboo-sensyu-o
Japan-Sports-NOM which-ball.club-NOM which-promising-player-ACC

↓itii-simee- siyooto-siteiru-***kadooka***] siritagatteiru-ka↓]
intend.to.select.as.No.1-**whether** want.to.know-$COMP_{WH}$

risuto-ni-site-mimasyoo.
make.a.list-let.us

'Let's list with respect to which ball club Sports Nippon wants to know if it will select which promising player as No. 1 draft pick.'

When the question embeds a non-island as in (10a), a list verb can successfully select it and a multiple-pair interpretation is still available, although computing of the entire sentence has become slightly more difficult because the sentence became longer. When the question embeds a Wh-island as in (10b), on the other hand, the sentence is simply uninterpretable, presumably because a single-pair reading as the only available interpretation of the embedded question is incompatible with a list verb. Quite importantly, when we have the embedded question in (10b) be selected by a **non**-list verb like *gozonzi-desu* 'you.know' as in (11), the sentence becomes interpretable again and yields a single-pair reading.

(11) [Supo-Niti-ga-desune, [**DO**'no-kyuudan-ga **DO**'no-yuuboo-sensyu-o
Japan-Sports-NOM which-ball.club-NOM which-promising-player-ACC

↓itii-simee-siyooto-siteiru-***kadooka***] siritagatteiru-ka↓
intend.to.select.as.No.1-**whether** want.to.know-$COMP_{WH}$

gozonzi-desu-ka?.
you.***know***-$COMP_{WH}$

'Do you know with respect to which ball club Sports Nippon wants to know if it will select which promising player as No. 1 draft pick?'

Since the length of a sentence is not significantly different between (10b) and (11), the uninterpretability of (10b) does not seem to arise from any such non-grammatical factor. Instead, since the two cases are distinct from each other only with respect to the matrix predicate, their contrast must have

originated from the interaction of the matrix predicate and the embedded clause, presumably in the way we just described.

Let us present another observation, which we will refer to as the "**Masked Additional-Wh Effect**." Its investigation starts with the "Masked **Island** Effect" we have just identified. That is, a multiple-pair interpretation becomes unavailable when the scope of multiple Wh-phrases is extracted out of a Wh-island. Interestingly, we now observe that when one of such multiple Whs is located outside the island as in (12a), a multiple-pair interpretation becomes available again under the matrix CP.

(12) a. rekidaino **DO**'no-daitooryoo-ga [**DO**'no-tosi-ni ↓sensoo-ni
past which-President-NOM which-year-in war-to

totunyuu-subeki-***kadooka***] sinkenni kentoosita↓-no↑?
go-should-***whether*** seriously considered-$COMP_{WH}$

'Which President, past or present, seriously considered whether to go to war in which year? '

b. [rekidaino **DO**'no-daitooryoo-ga [**DO**'no-tosi-ni ↓sensoo-ni
past which-President-NOM which-year-in war-to

totunyuu-subeki-***kadooka***] sinkenni kentoosita-ka↓]
go-should-***whether*** seriously considered-$COMP_{WH}$

risuto-ni-site-mimasyoo.
make.a.list-let.us

'Let's list which President, past or present, seriously considered whether to go to war in which year.'

The sentence in (12a) thus can be interpreted as a direct question seeking for the identification of either a single combination or multiple combinations of President and a specific year. We can solidify this observation once again by letting this question be selected by a list verb as in (12b). The sentence is acceptable, this time, only with a multiple-pair interpretation, as expected.

To sum up so far, we have seen that Wh-in-situ in Japanese exhibits neither Subjacency effects, a type of island effects, nor the additional-Wh effect, a case of Subjacency amelioration, in regard to Wh-scope. We have found, however, that Japanese exhibits "Masked Island Effect" and "Masked Additional-Wh Effect." That is, a Wh-island effect and the additional-Wh effects do show up interpretively. The question is how we can account for these seemingly contradictory phenomena at the same time.

2 Proposals and Arguments

2.1 Basics

We would like to offer an account for these selective Wh-effects based on a simple premise: Covert Wh-movement is subject to Wh-islands. Under a multiple-pair interpretation, one of the Whs moves to a position where it asymmetrically c-commands the remaining Wh(s). Thus, if all Whs are confined within a Wh-island at the surface, the multiple pair interpretation does not arise. It is also expected that, if one of the Whs is placed outside an island at the surface, the multiple-pair reading is possible. This prediction is correct, as we have seen earlier. As far as Wh-scope is concerned, it can be assigned without any movement. When all Whs stay in situ throughout derivation, however, only the single-pair interpretation is obtained for matrix scope. The island insensitivity under such a reading is therefore expected. While we have no new insights to add to the existing literature concerning scope of immobile Whs (cf. Reinhart's (1997) approach appealing to "choice function"), we feel compelled to elaborate on the covert Wh movement required for multiple-pair interpretations.

2.2 Drawing Analogy from Multiple-Pair Readings of Wh+QP

The starting point of our account is the multiple-pair interpretations observed in Wh-questions containing universal quantifiers. As is well-known, a question such as (13A) can be answered in three different ways — with a single answer, a functional answer and a multiple-pair (= pair-list) answer, as illustrated in (13B-D), respectively.

(13) A. Which paper did every student read?
B. Chomsky's paper
C. Only the one that was assigned to them.
D. Joe read Krifka's paper, Ken read Frege's, and Ann read Russell's.

Among a variety of analyses of this phenomenon, we model our analysis after Krifka (2001), who proposes to derive the multiple-pair readings by quantifying into speech acts. His theory can be summarized as follows. First, a speech act (*a*) is added as a basic type to the ontology. Second, a speech act operator is explicitly represented at LF and is placed over a CP. Third, a universal quantifier can move over a speech act operator. Forth, a universal quantifier is interpreted as the Boolean conjunction. With these ingredients, the interpretation of question (13A) is derived as illustrated in (14).

(14) a. LF: [[**every student**]$_1$ [[QUEST] [$_{CP}$ which paper did **t**$_1$ read?]]
↑_____|

b. ⟦every student⟧ = λP.[**&**{P(y) |student'(y)}] where **&** conjoins speech acts.

⟦[[every student] $_1$ [[QUEST] [$_{CP}$ which paper did t_1 read?]]⟧
= λP.[**&**{P(y) |student'(y)}] (λz.QUEST(λp.∃x[paper'(x) ∧ p = read'(x)(z)]))
= **&**{ QUEST(λp.∃x[paper'(x) ∧ p = read'(x)(y)]) |student'(y)}
= Which paper did Student A read, and which paper did Student B read, and which paper did Student C read?

The similarity between multiple Wh-questions and "Wh + *every*" questions has been noticed before. It has indeed been suggested (e.g., S. Watanabe (2000), E Kiss (1993), among others) that one of the Wh-phrases is interpreted as a universal quantifier in a multiple Wh-question exhibiting a multiple-pair interpretation. Although we will follow the spirit of this idea, our proposal does not involve the mysterious metamorphosis of a Wh-phrase into a universal quantifier.

2.3 Main Proposal

We propose that one of the Wh's in a multiple-Wh-question covertly moves out of the scope of the speech act QUEST in order to evoke the multiple-pair reading, just as a universal quantifier does in Krifka's (2001) system. The moved Wh is a function from individual-question act pairs to individual-question act pairs, **<<e, a>, <e, a>>**. The question as a whole denotes individual-question act pairs, which can be considered as conjoined questions. To see how this proposal works, let us consider a specific example.[4]

(15) a. Dono-kyuudan-ga dono-sensyu-o itii-simee-simasuka?
Which.ball.club-NOM which-player-ACC select-as-#1-COMP$_{\mathbf{WH}}$

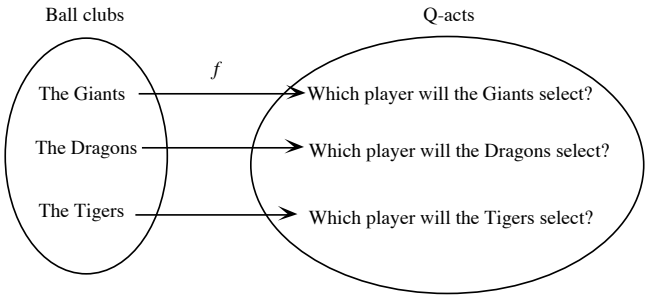
'Which ball club will select which player as its No.1 draft pick?'

b. LF:[[**which ball club**]$_1$ [[QUEST] [**t**$_1$ will select which player?]]]
↑_____|

⟦which⟧ = λP$_{<e,t>}$. λ$\mathscr{E}_{<e,a>}$. λz$_e$. [P(z)] [$\mathscr{E}$(z)]
⟦which ball club⟧ = λ$\mathscr{E}_{<e,a>}$. λz$_e$. [ball-club'(z)] [$\mathscr{E}$(z)]
⟦1 [[QUEST] [t_1 will select which player?]]]⟧
= λx. QUEST (λp. ∃y [player'(y) & p = select'(y)(x)])
⟦the whole sentence⟧ = λz$_e$ [ball-club'(z)] [QUEST (λp. ∃y [player'(y) & p = select'(y)(z)])] = the function ***f*** from ball clubs to question acts;

[4] We use the following convention. λx. [P(x)] [Q(x)] is understood as λx ∈ {y: P(y)} [Q(x)]. In other words, the first bracket corresponds to the domain of the function.

c.



This function *f* is reanalyzed as conjoined question acts: Which player will the Giants select, and which player will the Dragons select, and which player will the Tigers select?

This is the basic mechanics of our analysis of multiple-pair readings of multiple Wh-questions. The covert movement of one of the Whs is responsible for the lack of multiple-pair readings for questions in which all Whs are within a Wh-island. This part is simple enough. What is not clear is the nature of this covert movement. Since the application of this type of Wh-movement has not been explored in the literature, it may raise more questions than answers. In the following subsection, we will address some of them.

2.4 Some Questions and Answers

The first question that comes to anyone's mind may be what serves as the trigger of the covert Wh-movement over QUEST. In Krifka's (2001) analysis, the quantifier that moves out of QUEST is a topic. In a multiple Wh-question, the Wh moves to a topic position and becomes a part of the topic. In general, a topic can function as a domain restrictor (cf. Partee (1991), and it can also restrict Wh-quantification, as exemplified in (16).

(16) [{Yamada-sensee-no kenkyuusitu /$\varnothing_{\text{TOP}}$}]-wa **dare/dono-**gakusee-ga
Yamada-prof-GEN research team-TOP who/which-student-NOM

sukuranburingu-ni-tuite kenkyuu-site-imasu-ka?
Scrambling-dat-about research-do-prog-$\text{COMP}_{\textbf{WH}}$

'Speaking of Professor Yamada's research team, who/which student (in his team) is working on scrambling?'

The restriction associated with a Topic (including a phonetically null topic $\varnothing_{TOP}$) and the restrictive content of a Wh-phrase are put together so that the two constitute a combined restriction for Wh-quantification. One way to achieve such a combination is to move the Wh to the topic position. Al-

though this movement is in principle optional, we argue that it becomes obligatory when an uninterpretable feature is introduced under the head of the Topic Phrase and yields a multiple-pair interpretation. We tentatively call it "EN(umeration)-feature," and assume that this uninterpretable feature must be matched against an interpretable EN-feature, which is inherent to "enumerable" operators like Whs (cf. Deguchi (2003)). This obligatory feature matching then triggers the covert movement of a Wh-phrase to a position within a Topic Phrase (cf. Pesetsky's (2000) covert phrasal movement) and yields a multiple-pair interpretation involving the complex restrictive content of a Wh-phrase as described above. Note also that the moved Wh itself is **not a topic** (we may want to call it a *topic associate*). Hence, we do not expect the Wh to be topic-marked with *wa*.

There are several facts that point to the topicality of the moved Wh. First, Kuno (1982) noted that an overtly fronted Wh-phrase in English takes higher scope than other Wh-expressions (p.144), and that the Wh-expression taking higher scope is interpreted as the **sorting key**, which represents the key for sorting relevant pieces of information in the answer (p. 142). Usually, the discourse-anaphoric quantifiers (including Wh-phrases) take higher scope than those which are not discourse-anaphoric. The notion of discourse-anaphoricity is represented by the association with a topic.

As for more empirical matters, the behavior of the expression *ittai* suggests the asymmetry among the Wh-phrases in a multiple-Wh-question. Contrary to the popular assumption, we believe that *ittai* is not necessarily an anti-D-linking indicator. Rather, it emphasizes the total ignorance or the lack of clue on the speaker's part as to what would be a likely answer to the question. It in fact seems to be the case that *ittai* cannot be attached to the first Wh (the sorting key Wh) under the multiple pair interpretation, while there is no such restriction on the second Wh. (We must avoid letting *ittai* take scope over the entire embedded CP, which would make (17a) acceptable. A short intonation break in the position indicated by "//" helps us achieve this effect.)

(17) a. #kinoo-no paatii-de [**ittai** **DO**'no okyaku-ga] //
yesterday's party-at ITTAI which guest-NOM

DO'no-ryoori-o ↓motte-kita-ka↓ risuto-ni-site-kudasai
which dish-ACC bring-came-$COMP_{WH}$ list-dat-do-please

'Please make a list of which guest (ittai) brought which dish at yesterday's party.'

b. kinoo-no paatii-de **DO**'no okyaku-ga [**ittai** **DO**'no-ryoori-o]
yesterday's party-at which guest-NOM ITTAI which-dish-ACC

↓motte-kita-ka↓ risto-ni-site-kudasai
bring-came-COMP$_{WH}$ make.list-please

'Please make a list of which guest brought which dish (ittai) at yesterday's party.'

The NP restriction of the first Wh is a part of the domain restriction for the functional Wh. The function assigns an individual-Question Act pair to **each** of the members in the domain. In other words, the speaker is not asking to pick relevant entities out of the domain as the answer to the question. Therefore, the notion of total ignorance or lack of clue does not arise for the first Wh. The incompatibility of *ittai* and the first Wh is expected under our analysis.

Another piece of evidence comes from clefted Wh-questions. The Japanese cleft construction takes the following form:

(18) [$_{NP}$ [$_{CP}$ …] no]-wa **[$_{XP}$** … **]**-da (where *XP* is focus.)

The pre-copula XP can host both Indirect Object (IO) and Direct Object (DO), and these objects can be Wh-phrases. In such a case, however, the question does not have the multiple-pair reading, which shows a clear contrast with a non-clefted counterpart. The examples (19a-b) illustrate the contrast. (# indicates unavailability of a multiple-pair reading here.)

(19) a. #[[[Ken-ga okutta]-no]-wa **DO**'no-peepaa-*o* **DO**'no-zyaanaru-***ni***-ka]
Ken-NOM sent-NML-TOP which paper-ACC which journal-DAT-COMP$_{WH}$

risuto-ni-site-kudasai
make.list-please

'Lit: Please make a list of which paper to which journal it is that Ken sent.'

b. [Ken-ga **DO**'no-peepaa-*o* **DO**'no-zyaanaru-***ni*** ↓okutta-ka↓]
Ken-NOM which paper-ACC which journal-DAT sent-COMP$_{WH}$

risuto-ni-site-kudasai
make.list-please

'Please make a list of which paper Ken sent to which journal.'

Since the pre-copula XP position in the cleft construction is necessarily focused, neither Wh can function as the sorting key, which requires topicality. Hence, the multiple-pair interpretation is correctly predicted to be unavailable.[5]

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[5] We have noted one problem of our analysis —it incorrectly predicts that a single-Wh question has a 'conjoined-yes-no-question-acts' interpretation. For the discussion on this issue, see Kitagawa and Tomioka (To Appear).

3 Wh-reordering Effects

One of the main slogans of our proposal was that not all Wh-phrases are equal under the multiple-pair interpretation of a multiple Wh-question. One Wh-phrase is necessarily construed as the sorting key, and it receives such a status by being associated with the sentence topic. This association is done by movement of the Wh-phrase to the topic position that is beyond the scope of the speech act operator QUEST. We proposed above that this covert movement applies for the obligatory matching of the EN-feature in Topic and that in the Wh-phrase. This analysis leads us to the prediction that we can only move the Wh-phrase (hierarchically) closest to the topic position in multiple Wh-questions. This restriction can be regarded as an instance of minimality constraints (cf. *Minimal Link Condition*, *Shortest Move/Attract* (Chomsky (1995)), etc.). Generally, in fact, the Wh that comes first necessarily acts as the sorting key, as illustrated in (20a-b).

(20) a. **DO**'no↓ kyuudan-**ga** **DO**'no↓ yuuboo-sensyu-**o** itii-simee-simasita↓ ↓-ka?
which-ball.club-**NOM** **whih**-promising-player-**ACC** selected.as.No.1-**COMP$_{WH}$**
'Which ball club selected which promising player as No. 1 draft pick?'

b. **DO**'no↓ yuuboo-sensyu-**o** **DO**'no↓ kyuudan-**ga** itii-simee-simasita↓ ↓-ka?
which-promising-player-**ACC** **which**-ball.club-**NOM** selected.as.No.1-**COMP$_{WH}$**
'Which promising player did which ball club select as No. 1 draft pick?'

Here, the speaker of the first question is asking for a list organized in accordance with the ball clubs while that of the second question is asking for a list in accordance with the promising players. In this way, surface reordering of Wh-phrases results in asymmetrical interpretations of multiple Wh-questions.

As is well-known, the observation known as the Superiority Effect reports surface asymmetry of multiple Whs in the form of distinct grammaticality judgments as in (21). The examples and judgments are from Pesetsky (1987).

(21) a. ***Who***$_1$ did you persuade $\mathbf{t}_1$ to read *what*?
b. ?? ***What***$_2$ did you persuade *who*(*m*) to read $\mathbf{t}_2$?

Although the full account of the Superiority Effect goes beyond the scope of this paper, we would like to point out that our system sheds new light on certain type of Wh-reordering effects in German, French and Japanese in connection with the Superiority Effect and multiple-pair interpretations.

3.1 Wh-reordering Effects in German

It seems to be standardly assumed that, unlike in English, superiority phenomena are not observed in simplex sentences in German, and both orders of the Wh-elements allow multiple-pair interpretations (Haider (1986), Grewendorf (1988), among others).

(22) a. **Wer** liebt **wen**
Who-**NOM** loves who-**ACC**

'Who loves who(m)?'

b. **Wen** liebt **wer**?
Who-**ACC** loves who-**NOM**

'Lit: Who(m) does who love?'

We also observe that the different orders in (23) do not exhibit either overt or interpretative superiority effect, where multiple-pair interpretations are possible even with '*which* +singular N' within a subordinate clause selected by a list predicate *eine Liste machen* 'make a list':

(23) a. Machen wir eine *Liste* **welche Frau welchen Mann** liebt!
make we a *list* which-**NOM** woman which-**ACC** man loves

'Let's list which woman loves which man.'

b. Machen wir eine *Liste* **welchen Mann welche Frau** liebt!
which-**ACC** man which-**NOM** woman

'Let's list which man which woman loves.'

Let us note here, however, that semantic asymmetry obligatorily arises from the surface reordering of Whs — with the unmarked word order as in (23a), the subject Wh is interpreted as the sorting key, but the object Wh comes to be interpreted as the sorting key when it is scrambled over the subject Wh as in (23b). Thus, the speaker of the first question is asking for a list organized in accordance with the women while that of the second question is asking for a list in accordance with the men.

Wiltschko (1997, 119-121), on the other hand, presents an example like (24b), which she claims to be ungrammatical due to the Superiority Effect.

(24) [I have heard that Peter and Mary had an affair. Can you tell me:]

a. **Wer** hat **wen** verführt?
who-**NOM** has who-**ACC** seduced

'Who (= who of two) seduced who (= who of two)?'

b. *__Wen__ hat **wer** verführt?
who-**ACC** who-**NOM**

Example (24b) indeed is noticeably awkward, and we believe that Wiltschko is correct in pointing out that the crucial factor here is the involvement of only two individuals in the event expressed by the sentence. While she attempts to capture this reordering effect in terms of the notion D-linking, we can pursue an alternative account appealing to the notion sorting keys arising from our analysis argued for above. We believe the key observation is that the sentences in (24) involve the context in which sorting keys are not effectively elicited. In fact, the question asked both in (24a) and (24b) can be paraphrased as an alternative question of the form "Do you think X seduced Y, or Y seduced X?" In this "concealed alternative question" context, the notion of sorting key becomes neutralized. If surface reordering of Whs has the function of altering the sorting key in multiple-pair interpretations as we have observed above, the reordering as in (24b) in a sense has been carried out in vain. Based upon this observation, we ascribe the emergence of "superiority" in (24b) to the economy principle. Since no multiple-pair presupposition is involved in (24), there is no motivation for singling out one of the Whs as the sorting key. (24a) and (24b) therefore would yield a semantically identical multiple Wh-question, and the less economical derivation in (24b) is prohibited. In a nutshell, the movement of the lower Wh-phrase in a multiple Wh-question is discouraged when there is no need for the moved Wh to be the sorting key.

The relevance of sorting keys in surface reordering effects in German can be further demonstrated when we examine a multiple Wh-question that involves a "symmetric predicate." Consider the predicate *passen* 'match'. For any A and B, if A matches B, then, it is true that B matches A (or A and B match). If this predicate is used in a multiple Wh-question, the canonical word order is far more natural than the reordered version as shown in (25a) and (25c).

(25) a. **Welches** Teil passt zu **welchem** Teil?
which piece fits to **which** piece

'Which piece matches which piece?'

b. ≈ Which X and Y do you think match perfectly?

c. #Zu **welchem** Teil passt **welches** Teil?
to **which** piece fits **which** piece

'Which piece does which piece match?

Unlike (24a), (25a) can provide a multiple-pair interpretation and the subject Wh can act as the sorting key. The symmetrical nature of the predicate, however, eliminates the difference between the subject and the object with respect to sorting keys. Therefore, (25a) and (25c) would have the same interpretation, whether the sorting key is the subject or the object. In such a

case, the reordering by movement is less economical and is again discouraged.

The generalization that emerges from our discussion so far is that the reordering of Wh-phrases is found odd when there is no need to single out one of the Wh-phrases or when there is no effect of altering the resulting sorting key. We believe that this constraint stems from an economy principle akin to the one that Fox (2000) proposed, in which covert movement operations that do not lead to distinct semantic interpretations are prohibited.

3.2 Further Evidence for the Economy Account from French

Our economy account receives independent support from French. French is known to permit both options of Wh-in-situ and overt Wh-movement, at least in a matrix clause. In (root) multiple Wh-questions with multiple-pair interpretations, too, all Wh-phrases may remain in situ or one of them may undergo overt Wh-movement, as in (26a-b):

(26) a. Wh-in-situ: Il a donné **quoi** à **qui**?
he has given **what** to **whom**

b. Overt Wh-movement: **Qu**'a-t-il donné à **qui**?
what.has.he given to **whom**

As noted by Boskovic (1998, 2), however, overt Wh-movement in (26b) permits only a multiple-pair reading while Wh-in-situ in (26a) permits both multiple-pair and single-pair readings. Now, when we attempt to come up with a similar pair with a "concealed alternative question" as in (27a-b) below, (27b), the sentence involving movement becomes noticeably awkward even for a multiple-pair interpretation.

(27) [Context: I heard that you helped the two big names get to know each other at your party.]

a. Donc, tu as introduit **quel homme** à **quel homme**?
so you have introduced which man to which man

'Lit: So, you introduce which man to which man?'

b. #Donc, **quel homme** as tu introduit à **quel homme**?
so which man have you introduced to which man

'So, which man did you introduced to which man?'

To reiterate, in the context for (27), there is no reason for either of the Whs to be singled out as a sorting key. Our economy approach therefore predicts that, when both movement and in-situ options are available as in French, the movement option is discouraged as a less economical option of derivation. Hence, the awkwardness of (27b) naturally follows from our analysis.

3.3 Wh-reordering Effects in Japanese

It is also well-known that the Superiority effects in the form of ungrammaticality is not detected in Japanese. Hagstrom (1998, 74), however, claims that the effect emerges interpretively. He reports his informants' judgment that, while the unmarked order of the two Wh-phrases as in (28a) gives rise to both the multiple-pair and the single-pair interpretations, the marked word order as in (28b) eliminates the multiple-pair reading.

(28) a. **Dare**-ga kinoo **nani**-o katta-no?
who-**NOM** yesterday what-**ACC** bought-**COMP$_{WH}$**

'Who bought what yesterday?'

b. **Nani**$_1$-o kinoo **dare**-ga katta-no?
what-**ACC** who-**NOM**

Although we agree that a multiple-pair interpretation is somewhat harder to obtain in (28b) than in (28a), we do not believe that Hagstom's generalization holds. It is not too difficult to identify multiple Wh-questions in the marked word order that yield the multiple-pair interpretations, as in (29) and (30) below. A single-pair interpretation in fact is highly discouraged by the involved pragmatics in (29), and is prohibited by the use of a list verb in (30). (Let us here remind ourselves of the involvement of Complex EPD, as indicated by the "nested box" notation.)

(29) [Talking about a play:]

DO'no↓ yaku$_1$-**o** konkai-wa **DO**'no↓ yakusya-ga **t**$_1$ enziru-kotoni-natteru↓ ↓-no?
which role-ACC this.time which actor-NOM is.playing-COMP$_{WH}$

'Which role is which actor supposed to play this time?'

(30) **DO**'no↓ busyo$_1$-**o** itumo **DO** 'no↓ syain-**ga** **t**$_1$ tantoo-siteiru-ka↓ ↓
which division-**ACC** always which employee-**NOM** be.in.charge-COMP$_{WH}$

risuto-ni-site-kudasai
make.a.list.please

'Please make a list of which division which employee is always in charge of.'

These examples show that the distinct order of Wh-phrases does not affect the availability of multiple-pair readings. Why is it the case, then, that some native speakers find Hagstrom's example (28b) to lack the multiple-pair reading? The reason is that Wh-reordering does yield semantic asymmetry influencing our decision of interpreting which Wh to be the sorting key. Since the object Wh in (28b) appears higher than the subject Wh, the former should be interpreted as the sorting key. However, as Kuno (1982) suggests, what is a likely candidate for the sorting key Wh depends on contextual information and our world knowledge. In a case like (28b), it is less likely

(though not impossible) to use the set of purchased items as the sorting key in order to list the purchaser(s) of each item. Our examples (29) and (30), on the other hand, do not suffer from this pragmatic unnaturalness. It is sensible to make a casting list based on the roles or to sort out the employee assignment by using the positions. The use of the adverbial *kinoo* 'yesterday' in (28b) may also add unnaturalness to the multiple-pair reading involving separate shopping. Hence we conclude that the distinct order of Wh-phrases does not affect the availability of multiple-pair readings per se. On the other hand, the overt ordering does have an effect on the choice of the sorting key.

As in the German cases, we predict that when there is no point in picking out one of the Whs as a sorting key, a surface reordering effect should emerge. In a "'concealed alternative question" as in (31), we indeed find (31c), the reordered version of (31a), noticeably odd.[6]

(31) a. [I heard that they are having an affair:]

DO'tti-**ga** kimi-wa ↓[**DO**'tti-**o** ⇓sasotta-to omou⇓]↓?
which-**NOM** you-TOP which-**ACC** seduced-**COMP**$_{\textbf{THAT}}$ think-**COMP**$_{\textbf{WH}}$?

'Which do you think seduced which?'

b. = Do you think X seduced Y, or Y seduced X?

c. #**DO**'tti$_1$-**o** ↓(kimi-wa) [**DO**'tti-**ga** t_1 ⇓sasotta-to omou⇓]↓?
which-**ACC** which-**NOM** |
↑_____|

We can also see similar reemergence of surface reordering effect with a "symmetrical predicate," as shown by the contrast between (32a) and (32c).

(32) a. [Talking about a jigsaw puzzle]

DO'no ↓piisu-ga kimi-wa [**DO**'no ⇓piisu-to pittari-au-to omou⇓]↓?
which piece-**NOM** you-TOP which piece-with perfectly.fit think

'Which piece do you think fits with which piece perfectly?'

b. ≈ Which X and Y do you think fit perfectly?

c. #**DO**'no↓piisu$_1$-to kimi-wa [**DO**'no⇓piisu-ga t_1 pittari-au-to omou⇓]↓?
which.piece-with which.piece-NOM |
↑_____|

6 Since the marked word order within a single IP may not involve reordering in overt syntax (at least in Japanese), we will examine only the examples involving long-distance reordering in our discussion of the economy effect.

Sentence (32a) can provide a multiple-pair reading with the subject Wh interpreted as the sorting key. It is extremely difficult, on the other hand, to maintain a similar multiple-pair reading with the reversed sorting key in (32c) while a single-pair interpretation may be still available.

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