No Coordination after Movement in Japanese*

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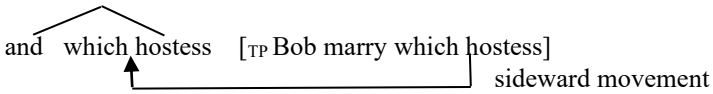
1 Introduction

The construction given in (1) has what Postal (1998) calls Interwoven Dependency, which has been abbreviated as ID in this paper.

(1) [[Which nurse]$_1$ and [which hostess]$_2$] did Fred date e_1 and Bob marry e_2, respectively? (Postal 1998: 134)

Two distinct elements appear to have been extracted out of the conjuncts in (1). Zhang (2007) proposes that each of the coordinated *wh*-phrases is originally base-generated within the conjuncts separately and then get coordinated via sideward movement in the course of the derivation (see also Bošković 2019). As illustrated in (2), *which hostess* undergoes sideward movement and gets merged with *and*.

(2)



The resulting constituent then gets merged with *which nurse*, which moves out of another TP. If the sideward movement analysis is on the right track, it follows that the target of Merge is not necessarily a root. In other words, the so-called Extension Condition (Chomsky 1993) should be relaxed. This is a very important consequence to the current syntactic theory, where investigating the nature of Merge is one of the central issues. Therefore, it is im-

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portant to examine the validity of this 'coordination-after-movement' approach. The aim of this study is to take a close look at the ID in Japanese and investigate whether the Japanese ID is also derived via sideward movement.

The rest of this paper is organized as follows. Section 2 shows that ID is available in the cleft construction in Japanese. Section 3 argues that the anti-reconstruction effect shows that Japanese ID is derived via Across-the-Board (ATB) null operator movement without recourse to sideward movement. Section 4 investigates how to guarantee that the traces left by the ATB null operator movement can be interpreted as non-identical. Section 5 summarizes the paper.

2 Japanese ID

Bošković (2019) argues that ID is available in Japanese based on the following example.[1]

(3) John-ga mikan-o$_1$ sosite banana-o$_2$ yaoya-kara
John-NOM orange-ACC and banana-ACC vegetable.store-from
(sorezore) [t_1 3-ko] to [t_2 5-hon] katta.
respectively 3-CL and 5-CL bought
'John bought three oranges and five bananas from a vegetable store.'
(Bošković 2019: 48)

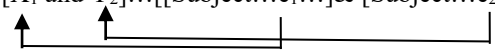
Bošković's claim that *mikan-o* and *banana-o* move out of the coordinate structure is based on the so-called stranding view of floating quantifiers in Japanese proposed by Miyagawa (1989), among others. Under this view, a quantifier and its host NP make a constituent and then the host NP undergoes movement, leaving behind the quantifier. However, the issue is controversial in Japanese syntax (see Nakanishi 2008 for an overview). Several researchers have challenged this view (e.g. Takami 1998). The literature includes another prevalent approach that treats floating quantifiers as adverbs and allows a quantifier and its associate NP to be base-generated separately. Under such a view, nothing forces *mikan-o* and *banana-o* to move out of the coordinate structure in (3): Their surface positions are base positions.[2] Alternatively, this study examines a less controversial case: the ex-

[1] The abbreviations used in this paper are as follows: ACC = accusative, C = complementizer, CL = classifier, GEN = genitive, NOM = nominative, PASS = passive, TOP = topic.

[2] Given the general assumption that *sosite* is a clausal coordinator, *mikan-o* and *banana-o* cannot be coordinated. One of the possibilities is that (3) involves clausal coordination instead

traction from the clausal conjuncts schematically illustrated in (4), where each conjunct has a gap associated with a noun involved in the coordinated NP that is dislocated.

(4) [X_1 and Y_2]…[[Subject…e_1…]& [Subject…e_2…]]



The configuration given in (4) is involved in the following cleft example.

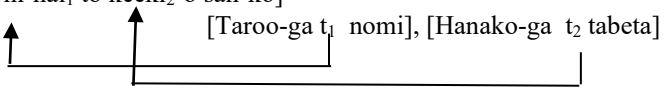
(5) [Taroo-ga e_1 nomi], [Hanako-ga e_2 tabe]-ta no wa sorezore
Taroo- NOM drink Hanako- NOM eat-PAST C TOP respectively
[koohii-o ni-hai$_1$ to keeki$_2$-o san-ko] da.
coffee-ACC 2-CL and cake-ACC 3-CL be
Lit. 'It is two cups of coffee and three pieces of cake that Taroo drank and Hanako ate, respectively.'

Hiraiwa and Ishihara (2012) propose that the focused phrase of the cleft construction in (6) directly moves to the pre-copula position, which is followed by the movement of a remnant clause. As shown in (6b), the focused phrase moves to [Spec, FocP]. The clause that is attached to the topic marker *wa* then moves to [Spec, TopP], as shown in (6c).

(6) a. Taroo-ga e_1 nonda no wa **koohii-o ni-hai$_1$** da.
Taroo-NOM drank C TOP coffee-ACC 2-CL be
'It is two cups of coffee that Taroo drank.'
b. [$_{FocP}$ **koohii-o ni-hai$_1$** [[$_{TP}$ Taroo-ga **t_1** nonda] no] da]
c. [$_{TopP}$ [[$_{TP}$ Taroo-ga t_1 nonda] no]wa**$_2$** [$_{FocP}$ koohii-o ni-hai$_1$ **t_2** da]Top]

If this strategy is adopted for (5), *koohii-o ni-hai* and *keeki-o san-ko* are supposed to move out of the coordinate structure and get coordinated via sideward movement, as shown in (7).

(7) [koohii-o ni-hai$_1$ to keeki$_2$-o san-ko]
[Taroo-ga t_1 nomi], [Hanako-ga t_2 tabeta]



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of the nominal coordination of *mikan-o* and *banana-o*. It is tentatively suggested that (3) is analyzed as (i), where three clauses are involved and the first two verbs are elided.

(i) John-ga mikan-o ~~katta~~ sosite banana-o ~~katta~~ yaoya-kara (sorezore) 3-ko to 5-hon katta.

The movement dependency involved in (5) is confirmed by the island effect. The long-distance dependency across the clause boundary is allowed, as shown in (8).

(8) John-ga [Taroo-ga e_1 nonda] to ii, Mary-ga [Hanako-ga e_2
John-NOM Taroo-NOM drank that say Mary-NOM Hanako-NOM
tabeta] to itta no wa sorezore [koohii-o ni-hai$_1$ to keeki-o
ate that said C TOP respectively coffee-ACC 2-CL and cake-ACC
san-ko$_2$] da.
3-CL be
Lit. 'It is two cups of coffee and three pieces of cake that John said that Taroo drank and Mary said that Hanako ate.'

On the other hand, the relevant construction exhibits an island effect, as shown below.

(9) *[[Taroo-ga e_1 nomi, Hanako-ga e_2 tabeta atode] John-ga okurete
Taroo-NOM drink Hanako-NOM ate after John-NOM late
kita no wa] sorezore [koohii-o ni-hai$_1$ to keeki$_2$-o
came C TOP respectively coffee-ACC 2-CL and cake-ACC
san-ko] da.
3-CL be
Lit. 'It is two cups of coffee and three pieces of cake that John came after Taroo drank and Hanako ate, respectively.'

However, it would be hasty to conclude that the Japanese ID in (5) involves sideward movement like in (2), because an alternative strategy has been proposed for Japanese cleft constructions in the literature. Hoji (1987) proposes that the focused phrase is base-generated at the pre-copula position and that invisible movement takes place within the presupposed clause, as illustrated below.[3]

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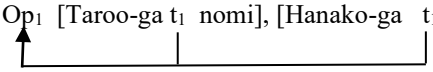
[3] Takeda (2018) points out that there are some cases that do not straightforwardly fall under Hiraiwa and Ishihara's analysis. (i) is one such example.

(i) (Taroo and Ziroo ate fruits after dinner.)
Taroo to Ziroo-ga e tabeta no wa Taroo-ga ringo-o ni-ko to Ziroo-ga
Taroo and Ziroo-NOM ate C TOP Taroo-NOM apple-ACC two-CL and Ziroo-NOM
nasi-o i-kko da.
pear-ACC one-CL be
Lit. 'What Taroo and Ziroo ate is Taroo (ate) two apples and Ziroo (ate) a pear.'
(Takeda 2018: 271)

(10) [Op$_1$ Taroo-ga t$_1$ nonda no wa] koohii-o ni-hai da.
Taroo-NOM drank C TOP coffee-ACC two-CL be
'It is two cups of coffee that Taroo drank.'

Under this approach, (5) can be derived by ATB null operator movement, as illustrated below, without appealing to the extraction of the distinct elements out of the coordinate structure.

(11) Op$_1$ [Taroo-ga t$_1$ nomi], [Hanako-ga t$_1$ tabe]-ta no wa sorezore…



The next section will address the issue of which strategy is involved in (5).

3 Anti-reconstruction effects

Let us consider (12), where the first conjunct of the focused phrase involves a bound pronoun to be bound by the subject of the first clausal conjuncts. The ungrammaticality of (12) shows that the binding in question is not available.

(12) ***Hotondo-no insei-ga$_1$** kawa-s-are, subete-no
most-GEN graduate.student-NOM buy-make-PASS all-GEN
gakubusei-ga moratta no wa sorezore [**soitu-no$_1$**
undergraduate.student-NOM be.given C TOP respectively his/her-GEN
sidookyookan-no hon-o ni-satu to Chomsky-no ronbun-o
adviser-GEN book-ACC 2-CL and Chomsky-GEN paper-ACC
ni-hon] da.
2-CL be
Lit. 'It is two books of their$_1$ adviser and two papers written by Chomsky that most of the graduate students$_1$ were forced to buy and all the undergraduate students were given, respectively.'

The ungrammaticality of (12) is surprising because if ID is not involved, a bound variable in the focused phrase can be bound, as shown in (13).

(13) Hotondo-no insei-ga$_1$ kawa-s-are-ta no wa
most-GEN graduate.student-NOM buy-make-PASS-PAST C TOP
soitu-no$_1$ sidookyookan-no hon-o da.
his/her-GEN adviser-GEN book-ACC be
Lit. 'It is their$_1$ adviser's book that most of the graduate students$_1$ were forced to buy.'

The grammaticality of (13) is naturally captured under Hiraiwa and Ishihara's analysis because the bound variable is c-commanded by its antecedent at the base position before the application of a series of movements, as shown below.

(14) Hotondo-no insei-ga**1** soitu-no**1** sidookyookan-no
most-GEN graduate.student-NOM his/her-GEN adviser-GEN
hon-o kawa-s-are-ta no da.
book-ACC buy-make-PASS-PAST C be
'Most of the graduate students$_1$ were forced to buy their$_1$ adviser's book.'

The binding failure in (12) indicates that the strategy available in (13) is not available in (12). If each of the coordinated phrases was base-generated in its object position, as illustrated in (15), then there would be no binding problem.

(15) Hotondo-no insei-ga$_1$ soitu-no$_1$ sidookyookan-no
most-GEN graduate.student-NOM his/her-GEN adviser-GEN
hon-o ni-satu kawa-sare, subete-no-gakubusei-ga
book-ACC 2-CL buy-make-PASS all-GEN-undergraduate.student-NOM
Chomsky-no ronbun-o ni-hon moratta no da.
Chomsky-GEN paper-ACC 2-CL be.given C be
'Most of the graduate students$_1$ were forced to buy two books of their$_1$ adviser, and all the undergraduate students were given two papers written by Chomsky.'

Under the null operator movement approach, on the other hand, there is no derivational point where the bound pronoun is c-commanded by its antecedent. Thus, this anti-reconstruction effect shows that the strategy proposed by Hiraiwa and Ishihara is not available to the relevant Japanese ID. This study assumes that the strategy proposed by Hiraiwa and Ishihara is available to the cleft construction as well as the null operator movement strategy to capture the reconstruction effect in (13). Why the former strategy is not available to (5) is a question left to future research.

As shown in (16), ID is available with scrambling as well, although it is slightly marginal compared to the cleft counterpart.

(16) [Koohii-o ni-hai$_1$ to keeki-o san-ko$_2$] sorezore [Taroo-ga e_1
coffee-ACC 2-CL and cake-ACC 3-CL respectively Taroo-NOM
nomi], [Hanako-ga e_2 tabe]-ta.
drink Hanako-NOM eat-PAST

Lit. 'Taroo drank two cups of coffee and Hanako ate three pieces of cake.'

One might argue that the grammaticality of (16) is problematic to the proposed analysis under the assumption that scrambled phrases directly undergo movement from their theta positions. However, an alternative strategy has been proposed by Ueyama (2003) on independent grounds. Her proposal is that scrambled phrases can be base-generated at the surface position and that null operator movement takes place, as schematically illustrated in (17).

(17) XP [Op_1 … t_1] (XP = scrambled phrase)

This study extends the null operator strategy to cases such as (16), which makes it possible to derive (16) without appealing to the relevant sideward movement strategy. As shown in (18), ID with scrambling also exhibits the anti-reconstruction effect like (12).

(18) *Soitu-no$_1$ sidookyookan-no hon-o nisatu to Chomsky-no
his/her-GEN adviser-GEN book-ACC two-CL and Chomsky-GEN
ronbun-o ni-hon sorezore hotondo-no insei-ga$_1$
paper-ACC 2-CL respectively most-GEN graduate.student-NOM
kawa-s-are, subete-no gakubusei-ga moratta.
buy-make-PASS all-GEN undergraduate.student-NOM be.given
Lit. 'Two books of their$_1$ adviser and two papers written by Chomsky, most of the graduate students$_1$ were forced to buy and all the undergraduate students were given, respectively.'

4 On the non-identity effect

It is often claimed that ATB movement such as shown in (19) follows an identity requirement: The variables left by the ATB movement are interpreted as identical.

(19) What did John recommend and Mary read?

Recall that, as illustrated in (11) and repeated below, the relevant construction involves null operator movement in an ATB fashion.

(20) Op_1 [Taroo-ga t_1 nomi], [Hanako-ga t_1 tabe]-ta no wa sorezore…

Notably, the variables left by the operator movement in (20) are supposed to be interpreted as non-identical. What Taroo drank is different from what Hanako ate. Let us consider how the non-identity is guaranteed in (20).

As observed in Munn (1992) and Munn (1999), ATB movement is not necessarily subject to the relevant identity requirement. Let us consider (21a) under the context given in (21b).

(21) a. Which man did Bill kill on Tuesday and Fred kill on Wednesday?
b. Bill and Fred are both hit men for the Mafia and they each have a respective list of targets. (Munn 1999: 422)

The following are felicitous answers to (21a).

(22) a. Bill killed his first victim and Fred killed his second.
b. Bill killed Bruno and Fred killed Arno. (Munn 1999: 422)

(22a) can be represented in terms of a function from hit men to victims. (22a) is an instance of the so-called functional reading of a question. In order to capture the answers in (21), Munn adopts the idea that the trace left by *wh*-movement can be functionally interpreted, a view that is originally due to Chierchia's (1993) analysis of (23).

(23) a. What did everyone bring to the party? (pair-list or individual)
b. Who brought every dish to the party? (only individual)

Let us consider Chierchia's informal logical forms for (23), given in (24), with the annotated LFs given in (25), where the functional traces have an argument that is denoted by a superscripted index.

(24) a. For which *f*: everyone$_x$ [x brought *f*(x) to the party]
b. For which *f*: every dish$_x$ [*f*(x) brought x to the party]
(Munn 1999: 423)

(25) a. [What$_1$ did [$_{IP}$ everyone$_2$ [t_2 bring t_1^2 to the party]]]
b. [Who$_1$ [$_{IP}$ every dish$_2$ [$_{IP}$ t_1^2 brought t_2 to the party]]]
(Munn 1999: 423)

In (24a), *everyone* undergoes Quantifier Raising and adjoins to IP. It licitly binds the individual variable in the functional *wh*-element denoted by *f(x)*. On the other hand, in (24b), the quantifier crosses over the individual variable that it binds because the relevant variable is in the functional *wh*-

element in the subject position. This is the configuration of the so-called weak crossover. Thus, the pair–list answer is not available in (23b).

Extending Chierchia's analysis, Munn proposes that the following LF is available to (21a).

(26) Which man$_1$ did Bill$_x$ kill t_1^x on Tuesday and Fred$_y$ kill t_1^y on Wednesday? (Mun 1999: 423)

In (26), the traces left behind by ATB movement are functional traces that contain arguments. Given that the indexing of the argument of the function must arise under c-command by an appropriate binder, *Bill* and *Fred* are qualified as appropriate binders. The representation in (26) thus yields the paired reading in question.

Munn's analysis nicely captures the absence of a paired reading in (27a).

(27) a. #Which man did John murder on Monday and kill on Wednesday?
b. Which man did John ^{x} murder t^x on Monday and kill t^x on Wednesday? (Munn 1999: 423)

The only c-commanding binder for the functional trace is *John*. As illustrated in (27b), the argument index of the second trace should be the same index as that of the first trace. (27b) is identical to the non-functional reading. (27a) is anomalous because it indicates that John killed the same person twice. The unavailability of a paired reading in the following example is similarly due to the absence of distinct binders.

(28) Which man murdered Sam and killed Bill? (Munn 1999: 424)

This study extends Munn's analysis to (20), as illustrated below.

(29) Op$_1$ [Taroo-ga$_x$ t^x_1 nomi], [Hanako-ga$_y$ t^y_1 tabe]-ta no wa sorezore…

The functional traces left by null operator movement are bound by *Taroo* and *Hanako*, respectively, which allows the variables left by the ATB movement of a single null operator to be interpreted as non-identical. Keeping this in mind, let us consider (30a), where the subjects are apparently dislocated out of the coordinate structure.

(30) a. *Koohii-o nomi, keeki-o tabe-ta no wa sorezore dansei-ga
coffee-ACC drink cake-ACC eat-PAST C TOP respectively man- NOM
huta-ri to zyosei-ga san-nin da.

two-CL and woman-NOM 3-CL be
Lit. 'It is two men and three women who drank coffee and ate cake, respectively.'

b. Two men drank coffee and three women ate cake.

The distributive reading in (30b) seems to be difficult to obtain for (30a) compared to a case like (5), where the objects are apparently dislocated. This is due to the absence of distinct binders for the variables left by operator movement, similar to (28).[4]

5 Summary

This study has investigated whether Japanese ID is derived by sideward movement. Based on the anti-reconstruction effect, the relevant dislocated phrase is base-generated at the surface position and the movement dependency is created by null operator movement in an ATB fashion. The gaps created by the relevant ATB movement are supposed to be interpreted as non-identical. It has been suggested that the non-identity interpretation can be guaranteed by adopting Munn's (1999) proposal that ATB movement can leave a functional trace.

References

[4] The following example is apparently a counterexample to the proposed analysis.

(i) Taroo-ga manga-o 100en de uri, zassi-o tada de age-ta no wa
Taroo-NOM comic-ACC 100.yen at sell magazine-ACC free for give-PAST C TOP
sozrezore dansigakusei huta-ri-ni to zyosigakusei san-nin-ni da.
respectively male.student 2-CL-DAT and female.student three-CL-DAT be
Lit. 'It is to two male students and three female students that Taroo sold a comic for 100 yen and gave a magazine for free.'

Under the assumption that the base position of a goal argument is higher than that of a theme argument in Japanese (Hoji 1985), there will be no distinct binder that c-commands each of the variables, as shown below.

(ii) Op_1 Taroo-ga [t_1 manga-o 100en de uri], [t_1 zassi-o tada de age]-ta no wa…

One possible solution is that, as Miyagawa (1997) proposes, both the theme–goal order and the goal–theme order are base orders, which allows the theme arguments to c-command the variables left by ATB movement, as shown below.

(iii) Op_1 Taroo-ga [manga-o t_1 100en de uri], [zassi-o t_1 tada de age]-ta no wa…

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