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Abstract

In this paper, I provide a set of data which is problematic for the movement theory of control (MTC) where claims that the distribution of Obligatory Control (OC) PROs is assimilated to that of NP-traces (cf., e.g., Hornstein 1999, 2001, 2003, Boeckx and Hornstein 2003, 2004, 2006). We observe Takano (2009) and Fujii (2006) which are captured under the MTC. Then I will show the problematic data for Takano (2009), and hence I propose that the MTC is problematic in Japanese. Instead, I propose an alternative analysis of control, an Equi NP Deletion analysis (cf., e.g., Rosenbaum 1967). This analysis can capture the problematic data for the MTC. Therefore, the Equi analysis is superior to the MTC empirically.

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Scrambling out of a control clause in Japanese: An argument against the Movement Theory of Control

Ako Imaoka

1 Introduction

In this paper, I provide a set of data which is problematic for the movement theory of control (MTC) where claims that the distribution of Obligatory Control (OC) PROs is assimilated to that of NP-traces (cf. e.g., Hornstein 1999, 2001, 2003, Boeckx and Hornstein 2003, 2004, 2006). Then, I propose an alternative analysis of control, an Equi NP Deletion analysis. This analysis can capture the problematic data for the MTC. Therefore, the Equi analysis is superior to the MTC empirically.

The rest of the paper is organized in the following way. In Section 2, we observe Takano (2009) which claims that scrambling out of a control clause reveals interesting asymmetries in binding effects that have previously been unnoticed. Takano explains these asymmetries under the MTC. In Section 3, we observe Fujii (2006), which proposes that split control is allowed in Japanese, and that it can be captured under the MTC. In Section 4, however, I will show the problematic data for Takano (2009), and hence I propose that the MTC is problematic in Japanese. Instead, in Section 5, I propose the alternative analysis of control, that is, "Equi NP Deletion analysis." Section 6 concludes the paper.

2 Scrambling out of a control clause in Japanese (Takano 2009)

It is widely believed that clause-internal scrambling can produce a new binding relation, whereas long-distance scrambling out of a finite clause fails to produce a new binding relation. (cf. e.g., Saito 1992, Tada 1993, among others). Relevant examples are the following:

(1) [[Mittu-izyoo-no daigaku]$_1$-ni]$_i$ soko$_1$-no sotugyoosei-ga t_i syutugansita.
three or more-GEN university-DAT it-GEN graduate-NOM applied
"Their$_1$ graduates applied to [three or more universities]$_1$."

(2) *[[Mittu-izyoo-no daigaku]$_1$-ni]$_i$ soko$_1$-no sotugyoosei-ga Aya-ni
three or more-GEN university-DAT it-GEN graduate-NOM Aya-DAT
[$_{CP}$ Ken-ga t_i syutugansita to] itta.
Ken-NOM applied that told
"Their$_1$ graduates told Aya that Ken applied to [three or more universities]$_1$."
(Takano 2009:76–77)

A necessary condition on bound pronoun binding is to be c-commanded by a Quantificational Phrase (QP). In (1), the QP in the object position undergoes scrambling to the sentence initial position. The condition on bound pronoun binding is satisfied, and thus the example (1) is acceptable. This observation indicates that clause-internal scrambling as shown in (1) can create a new binding relation. On the other hand, it is believed that the long-distance scrambled QP as shown in (2) cannot bind the bound pronoun. This observation shows that in (2), the long-distance scrambled phrase cannot remain in its surface position, and is reconstructed obligatorily.

Takano (2009) argues that scrambling out of an OC clause in Japanese reveals interesting asymmetries in binding effects that have previously been unnoticed. Consider (3) and (4) below:

(3) [[Mittu-izyoo-no daigaku]$_1$-ni]$_i$ Ken-ga [soko$_1$-no sotugyoosei]$_2$-ni
three or more-GEN university-DAT Ken-NOM it-GEN graduate-DAT
[$_{CP}$ PRO$_2$ t_i syutugansuru yoo(ni)] susume-ta.
apply C recommended
"Ken recommended [their$_1$ graduates]$_2$ [$_{CP}$ PRO$_2$ to apply to [three or more universities]$_1$]."

(4) *[[Mittu-izyoo-no daigaku]$_1$-ni]$_i$ [soko$_1$ -no sotugyoosei]-ga Ken$_2$-ni
three or more-GEN university-DAT it-GEN graduate-NOM Ken-DAT
[$_{CP}$ PRO$_2$ t_i syutugansuru yoo(ni)] susume-ta
apply C recommended
"Their$_1$ graduates recommended Ken$_2$ [$_{CP}$ PRO$_2$ to apply to [three or more universities]$_1$]. "
(Takano 2009:78–79; the indexes are original).

These examples involve control clauses and hence subject positions in the embedded clauses are occupied by null subjects, PROs. PROs are obligatorily controlled by the matrix indirect object, and the sentence-initial QP, which undergoes scrambling from the embedded clause, can bind the bound pronoun in the matrix clause, in (3) but not in (4). Surprisingly, (4) does not allow the bound variable reading, although a c-commanding condition on variable binding seems to be satisfied. Hence, the behavior of scrambling out of a control clause cannot be reduced to the behavior of clause-internal scrambling or that of long-distance scrambling out of a finite clause (contra, e.g., Nemoto 1993[1]). The generalization Takano draws from the asymmetry in (3) and (4) is that scrambling out of a control clause allows variable binding only if the bound pronoun is contained in the controller as in (3).

Takano proposes to capture this generalization based on the following assumptions in (5):

(5) a. Scrambling out of a control clause, like scrambling out of a finite clause, fails to produce a new binding relation.
b. Long distance scrambling is composed of shorter scramblings.
c. OC is derived by the MTC.

(5a) indicates that Takano assumes that a new binding relation is satisfied only in clause-internal scrambling, and that bound pronoun binding is not a LF condition. This assumption comes from the proposal in Saito (2003, 2005), which is based on Chomsky's (1995) proposal for the formation of operator-variable structures by deletion of parts of chains. As to an interpretation, Saito proposes that movement chains are interpreted cyclically by means of deletion of features, and that this operation which is called as "chain interpretation" deletes all features that are not selected from a position of a chain. For example, examine the example in (6a). This has a structure in (6b) under the copy theory of movement:

(6) a. Who did John see?
b. [$_{CP}$ who did John see who]
{P, O, A} {P, O, A}
c. [$_{CP}$ who did John see who]
{P, O, ~~A~~} {~~P~~, ~~O~~, A} (Takano 2009:89)
<"P", "O" and "A" refer to a Phonological-feature, an Operator-feature, an Argument-feature, respectively.>

On the assumption that each syntactic object has a set of features, Saito claims that *who* has the set of a P(honological)-feature, an O(perator)-feature and an A(rgument)-feature, and that an A-feature is crucial in forming a binding relation. (6b) demonstrates that *who* undergoes *wh*-movement, and then the feature set of *who* is copied and forms a chain. (6c) exhibits the structure where "chain interpretation" is applied. Under Saito's theory, first, the P-feature is retained in the head of the chain and is deleted in the tail of the chain. It is because overt movement selects this feature in the head of the chain. Second, the O-feature is selected and retained in the head of the chain since it enters into checking with C, and third, the A-feature is selected and retained in the tail of the chain since the object is θ-marked in the object position. As a result, the P-feature and the O-feature are located in [Spec, CP] and the A-feature is located in the object position as shown in (6c).

[1] Nemoto (1993) proposes that the behavior of scrambling out of a control clause patterns with that of clause-internal scrambling. However, Takano (2009) shows the problematic data as shown in (4).

Saito claims that "chain interpretation" analysis is also applied to scrambling. Let us consider the cases of scrambling. The relevant example of clause-internal scrambling is shown in (7):

(7) a. [sono daigaku-ni]$_i$ Ken-ga t_i syutugansita.
that university-DAT Ken-NOM applied
"Ken applied to that university."
b. [$_{IP}$ [sono daigaku-ni] Ken-ga [sono daigaku-ni] syutugansita]
{P, A} {P, A}
c. [$_{IP}$ [sono daigaku-ni] Ken-ga [sono daigaku-ni] syutugansita]
{P, ~~A~~} {~~P~~, A} (Takano 2009:91)

Saito assumes that scrambling does not involve an O-feature among the feature set, and that "chain interpretation" deletes an A-feature from the head of the chain. (7b) shows that *sono daigaku-ni* 'that university-DAT' undergoes scrambling, and the feature set is copied and forms a chain. (7c) is a structure where "chain interpretation" is applied. Under Saito's assumption, the A-feature is selected in the tail of the chain and then deleted in the head of the chain, and the P-feature is retained in the head of the chain. On Saito's assumption that binding requires an A-feature, clause-internal scrambling in (7) allows variable binding. It is because the scrambled phrase has the A-feature right after clause-internal scrambling as in (7b) even though this A-feature is deleted eventually as in (7c).

In addition, Saito proposes that long-distance scrambling fails to produce a new binding relation. It is because Saito assumes that, long movement proceeds through the embedded C-projection, and therefore, *sono daigaku-ni* 'that university-DAT' undergoes scrambling within an internal clause, and the feature set is copied and forms a chain. The internal scrambled phrase has the only P-feature eventually as shown in (7c), and therefore the following movement does not have the A-feature which is needed for binding. As a result of it, Takano adopts Saito's analysis that a new binding relation is satisfied only in clause-internal scrambling.

Takano's proposal in (5) shows that (3) and (4) are derived as in (8).

(8) a. SUBJECT [$_{CP}$ CONTROLLER QP V] V
→ b. SUBJECT [$_{CP}$ QP CONTROLLER t_{QP} V] V
→ c. SUBJECT CONTROLLER [$_{CP}$ QP $t_{CONTROLLER}$ t_{QP} V] V
→ d. QP SUBJECT CONTROLLER [$_{CP}$ t_{QP} $t_{CONTROLLER}$ t_{QP} V] V

Under the MTC, the controller originates from the subject of the embedded clause as in (8a) and checks a θ-role feature of the embedded verb. In the first step as in (8b), on the assumption shown in (5b) which follows from Saito (2003, 2005), the embedded object QP scrambles to a position at which the QP c-commands the controller. The second operation is movement of the controller to the matrix clause to check a θ-role feature of the matrix verb, as in (8c). Finally, as in (8d) the QP scrambles to the sentence-initial position. The important step for a bound variable interpretation is (8b). (8b) shows clause-internal scrambling which produces a new binding relation under Takano's assumption based on Saito (2003, 2005). Since in (3) the controller contains the bound pronoun, the bound variable reading is allowed. In contrast, this step has no effects on binding in (4), where the bound pronoun is not contained in the controller. A further step does not influence on producing a new binding relation under the assumption (5a), and therefore the sentence-initial QP in (4) cannot bind the bound pronoun. As a result, example (4) does not allow the bound variable interpretation.

Takano's proposal can capture the asymmetry between (3) and (4). What is crucial in this analysis is that a controller originates from the embedded clause, and that the bound variable reading is allowed only when the intermediate scrambling within the embedded clause have effects on a binding relation. Therefore, Takano's proposal argues strongly for the MTC.

3 Split control in Japanese (Fujii 2006)

The ban on split control has been considered to be a diagnostic property of OC as shown in (9) (cf. e.g., Bouchard 1984, Hornstein 2003, Hornstein and Lightfoot 1987, Koster 1984, Lebeaux 1984, Williams 1980). [2]

(9) *John$_1$ told Mary$_2$ [PRO$_{1+2}$ to leave together /each other]. (Hornstein 2003:13)

Predicates like *leave together* or *leave each other* require plural subjects. The unacceptability of example (9) shows that OC PROs cannot have two singular antecedents as their antecedents.

However, Fujii (2006) proposes that split control is allowed in Japanese when embedded clauses contain the exhortative particle *–(y)oo* as seen in (10), and he proposes the analysis for it appealing to the MTC.

(10) John$_1$-wa Bill$_2$-ni [$_{CP}$ Δ_{1+2} otagai -no kao-o sikame -yoo -to] itta.
John-TOP Bill-DAT each other-GEN face-ACC screw up exhortative YOO C] said
lit. "John$_1$ said to Bill$_2$ [Δ_{1+2} to screw up their face]. "
= "John said to Bill: "Let's screw up our own face. " " (Fujii 2006:120)

He observes that (10) involves OC, where the null subject in the embedded clause is controlled by both the matrix subject and the matrix indirect object. Under the MTC, the derivation of (10) proceeds as shown in (11):

(11) a. [$_{CP}$ [$_{MoodP}$ [NP$_1$+NP$_2$] V *(y)oo*] C°] V
→ b. [$_{VP}$ [NP$_2$ (+NP$_{1\ (pied\text{-}piping)}$)] [$_{CP}$ [$_{MoodP}$ [t_{NP1}+t_{NP2}] V *(y)oo*] C°] V
→ c. [$_{vP}$ NP$_1$ [$_{VP}$ NP$_2$ (+$t_{NP1\ (pied\text{-}piping)}$) [$_{CP}$ [$_{MoodP}$ [t_{NP1}+t_{NP2}] V *(y)oo*] C°] V

Under the MTC, NP$_1$ and NP$_2$ are conjoined, and the conjoined element is in [Spec, MoodP] as seen in (11a). In this position, it checks the embedded verb's θ-role feature. Then, as shown in (11b), one of the conjuncts, NP$_2$, moves to the indirect object position of the matrix clause to check the θ-role feature of the matrix verb, pied-piping the other conjunct, NP$_1$. Finally, NP$_1$ moves to [Spec, vP] to check the external θ-role feature of v as shown in (11c).

Here, consider the PRO-based analysis for split control. Fujii proposes that this analysis cannot capture split control because of the Principle of Minimal Distance (PMD) violation (cf. e.g., Rosenbaum 1970). It is considered that the distribution of PROs generally conforms to the PMD. The PMD selects "the NP closest in the tree in the infinitival" as a controller, as shown in (12):

(12) *John told Mary [Δ to wash himself]. (Fujii 2006:95)

In (12), the PMD requires the null subject in the embedded clause not to be bound by *John*, since *Mary* intervenes between *John* and *himself*. Under the PRO-based analysis, the derivation of (10) proceeds as shown in (13):

(13) NP$_1$ NP$_2$ [$_{CP}$ [$_{MoodP}$ PRO$_{1+2}$ V *(y)oo*] C°] V

The PRO in the embedded clause is controlled by the antecedent that is not closest, as well as the closest antecedent. Therefore, the distribution of the split control PRO violates the PMD, and hence the PRO-based analysis for split control is not adopted in Fujii (2006). Fujii's proposal is

[2] Landau (1999) claims that split control is allowed in English as shown in (i):
(i) John$_1$ proposed to Mary$_2$ [PRO$_{1+2}$ to meet each other at 6.] (Landau 2000:53)
Fujii (2006) claims that Landau's proposal for split control is independent from the grammatical nature of OC PROs. Also, Hornstein (2003:footnote 13) argues against Landau (2000), and claims that split control is not allowed in English.

the only analysis for split control in Japanese, which is currently proposed.

4 An Issue

Takano does not discuss split control. However, Takano's theory is problematic in cases of scrambling out of a split control clause. This observation may indicate that the MTC which Takano adopts is problematic in Japanese.

Consider (14) and (15).

(14) [[Mittu-izyoo-no daigaku]$_1$ -ni]$_i$ Ken$_2$-ga [soko$_1$-no sotugyoosei]$_3$-ni
three or more-GEN university-DAT Ken-NOM it-GEN graduate-DAT
[$_{CP}$ Δ_{2+3} t_i syutugansi-yoo- to] susumeta.
apply exhortative YOO C recommended
lit."Ken$_2$ recommended [their$_1$ graduates]$_3$ [$_{CP}$ Δ_{2+3} to apply to [three or more universities]$_1$]."
="Ken recommended their$_1$ graduates: "Let's apply to [three or more universities]$_1$" "

(15) *[[Mittu-izyoo-no daigaku]$_1$ -ni]$_i$ [soko$_1$ -no sotugyoosei]$_2$-ga Ken$_3$-ni
three or more-GEN university-DAT it-GEN graduate-NOM Ken-DAT
[$_{CP}$ Δ_{2+3} t_i syutugansi- yoo- to] susumeta.
apply exhortative YOO C recommended
lit. "[Their$_1$ graduates]$_2$ recommended Ken$_3$ [$_{CP}$ Δ_{2+3} to apply to [three or more universities]$_1$]."
="Their$_1$ graduates recommended Ken: "Let's apply to [three or more universities]$_1$." "

These examples contain the exhortative particle *-(y)oo*, and therefore they involve a split control clause. So, the null subjects in the embedded control clauses are controlled by both the matrix subject and the matrix indirect object at the same time. In these examples, the QP undergoes scrambling out of a split control clause, and the variable binding reading is allowed in (14), but it is not allowed in (15).

However, Takano's theory predicts wrongly that the variable binding reading is available in both examples. Let us consider how the derivation proceeds in the problematic example (15). Here, as to split control, we adopt Fujii's analysis of split control which we observed in the preceding section. The derivation of (15) proceeds as shown in (16):

(16) a. [$_{CP}$[$_{MoodP}$ [NP$_2$(b.p.) +NP$_3$] QP V *(y)oo*] C°] V
→ b. [$_{CP}$[$_{MoodP}$ QP [NP$_2$(b.p.)+NP$_3$] t_{QP} V *(y)oo*] C°] V]
→ c. [$_{VP}$ [NP$_3$ (+NP$_2$(b.p.)$_{(pied\text{-}piping)}$)] [$_{CP}$[$_{MoodP}$ QP [$t_{NP2(b.p.)}$+t_{NP3}] t_{QP} V*(y)oo*] C°] V]
→ d. [$_{vP}$ NP$_2$(b.p.) [$_{VP}$ [NP$_3$+$t_{NP2(b.p.)}$][$_{CP}$[$_{MoodP}$ QP [$t_{NP2(b.p.)}$+t_{NP3}] t_{QP} V *(y)oo*] C°] V] v]
→ e. QP [$_{vP}$ NP$_2$(b.p.) [$_{VP}$ [NP$_3$+t_{NP2}][$_{CP}$ [$_{MoodP}$ t_{QP} [$t_{NP2(b.p.)}$+t_{NP3}] t_{QP} V *(y)oo*]C°] V] v]
<(b.p.) refers to a bound pronoun.>

Under the MTC, the controller originates from the subject of the embedded clause as in (16a). In (16b), the embedded object QP scrambles to a position at which the QP c-commands the controller. One of the controllers, NP$_1$, contains the bound pronoun in (15), and hence the QP can bind the bound pronoun unexpectedly.[3] As a result, the data which we examined in this section indicates

[3] Obviously, the availability of the bound variable interpretation in (14) can be captured. The derivation is shown in (i):

that Takano's theory is problematic in the cases of scrambling out of a split control clause. The data in Takano (2009) are captured on the assumption that OC is derived by the MTC, and thus Takano argues for the MTC. Accordingly, the problematic data for Takano (2009) indicate that the MTC has problems in Japanese.

5 An Equi NP Deletion Analysis of Control Constructions

Alternatively, I propose that this problem can be explained under the view that control involves "Equi NP Deletion," which was proposed in the Standard Theory (cf. e.g., Rosenbaum 1967). It is an operation which deletes a coreferent subject of an embedded complement in the course of derivation. This analysis can provide an explanation for the problematic data in (15).

Before going into the consideration of the data under the Equi analysis, we need to modify the assumptions in (5) which is repeated below:

(5) a. Scrambling out of a control clause, like scrambling out of a finite clause, fails to produce a new binding relation.
b. Long distance scrambling is composed of shorter scramblings.
c. OC is derived by the MTC.

Firstly, consider (5a) assumption. It shows that only clause-internal scrambling can produce a new binding relation, and it comes from Saito's chain interpretation analysis. Contrary to this assumption, I propose that every scrambling generally fails to produce a new binding relation, that is, it is A'-scrambling. This follows from Saito (2003, 2005) with some modifications. I propose that if the A-feature is deleted eventually in the head of the chain, a new binding relation is not allowed. That is, a new binding relation is satisfied only if the A-feature is retained in the head of the chain. I assume that retaining the A-feature in the head of the chain is a costly operation, and then that all scrambling generally does not retain the A-feature in the head of the chain. As a result of it, all scrambling generally fails to produce a new binding relation. However, I propose that the A-feature is retained in the head of the chain, that is, scrambling enters into a new binding relation, only if the element undergoes scrambling over the elements which have effects on binding, such as a bound pronoun. This analysis is illustrated in (17) and (18):

(17) a.[[Mittu-izyoo-no daigaku]$_1$-ni]$_i$ soko$_1$-no sotugyoosei-ga t_i syutugansita.
three or more university-DAT it-GEN graduate-NOM applied
"Their$_1$ graduates applied to [three or more universities]$_1$."
b. [[Mittu-izyoo-no daigaku]$_1$-ni]$_i$ soko$_1$-no sotugyoosei-ga
{P, A}
[[mittu-izyoo-no daigaku]$_1$-ni] syutugansita.
{~~P~~, A}

(18) a. [[Mittu-izyoo-no daigaku]$_1$-ni]$_i$ Ken-ga t_i syutugansita.
three or more university-DAT Ken-NOM applied
"Ken applied to three or more universities."
b. [[Mittu-izyoo-no daigaku]$_1$-ni]Ken-ga[mittu-izyoo-no daigaku]$_1$-ni] syutugansita.
{P, ~~A~~} {~~P~~, A}

In (17), the QP undergoes scrambling over the bound pronoun, and thus the A-feature is retained in the head of the chain. In contrast, in (18) it undergoes scrambling over *Ken* which does not have effects on binding, and hence the A-feature is not retained in the head of the chain. In addition, in this case, further movement does not have the A-feature.

(i)a. [$_{CP}$ [$_{MoodP}$ [NP$_2$+NP$_3$(b.p.)] QP V *(y)oo*] C°] V
→b.[$_{CP}$ [$_{MoodP}$ QP [NP$_2$+NP$_3$(b.p.)] t_{QP} V *(y)oo*] C°] V]
→c. [$_{VP}$ [NP$_3$(b.p.) (+NP$_{2(pied\text{-}piping)}$)] [$_{CP}$ [$_{MoodP}$ QP [t_{NP2}+$t_{NP3(b.p.)}$] t_{QP} V *(y)oo*] C°] V]
→d. [$_{vP}$ NP$_2$[$_{VP}$ [NP$_3$(b.p.)+t_{NPj}] [$_{CP}$ [$_{MoodP}$ QP [t_{NP2}+$t_{NP3(b.p.)}$] t_{QP} V *(y)oo*] C°] V] v]
→e. QP[$_{vP}$ NP$_2$ [$_{VP}$ [NP$_3$(b.p.)+t_{NP2}] [$_{CP}$ [$_{MoodP}$ t_{QP} [t_{NP2}+$t_{NP3(b.p.)}$] t_{QP} V *(y)oo*] C°] V] v]
In the step (ib), the QP can bind the bound pronoun and then the variable binding relation is allowed.

Secondly, as to the (5b) assumption, I assume that if long distance scrambling is composed of shorter scramblings, much shorter scramblings are preferred. For example, the position between a subject and an indirect object may be a possible intermediate landing position. For example, in (19a), *hon-o* 'a book-ACC' undergoes scrambling as shown in (19b):

(19) a. [hon-o]$_i$ Taro-ga Jiro-ni [Δ t_i kau yoo(ni)] susumeta.
book-ACC Taro-NOM Jiro-DAT buy C recommended
"Taro recommended Jiro to buy a book."
b. [hon-o]$_i$ Taro-ga t_i Jiro-ni [t_i Δ t_i kau yoo(ni)] susumeta.

The third assumption (5c) which Takano adopts is that OC is derived by the MTC. Instead, we adopt the Equi analysis.

To sum up, Takano's assumption is modified as shown in (20).

(20) a. Assumption 1:
Scrambling generally fails to produce a new binding relation, that is, it is A'-scrambling. However, scrambling enters into a new binding relation, only if the element undergoes scrambling over the elements which have effects on binding, such as a bound pronoun.
b. Assumption 2:
Long distance scrambling is composed of shorter scramblings. Since much shorter scrambling is preferred, the position between a subject and an indirect object may be a possible intermediate landing position.
c. Assumption 3:
OC involves Equi NP Deletion.

Keeping these assumptions in mind, consider the examples of split control which are repeated below:

(14) [[Mittu-izyoo-no daigaku]$_1$ -ni]$_i$ Ken$_2$-ga [soko$_1$-no sotugyoosei]$_3$-ni
three or more-GEN university-DAT Ken-NOM it-GEN graduate-DAT
[$_{CP}$ Δ_{2+3} t_i syutugansi-yoo- to] susumeta.
apply exhortative YOO C recommended
lit."Ken$_2$ recommended [their$_1$ graduates]$_3$ [$_{CP}$ Δ_{2+3} to apply to [three or more universities]$_1$]."
="Ken recommended their$_1$ graduates: "Let's apply to [three or more universities]$_1$" "

(15) *[[Mittu-izyoo-no daigaku]$_1$ -ni]$_i$ [soko$_1$ -no sotugyoosei]$_2$-ga Ken$_3$-ni
three or more-GEN university-DAT it-GEN graduate-NOM Ken-DAT
[$_{CP}$ Δ_{2+3} t_i syutugansi- yoo- to] susumeta.
apply exhortative YOO C recommended
lit. "[Their$_1$ graduates]$_2$ recommended Ken$_3$ [$_{CP}$ Δ_{2+3} to apply to [three or more universities]$_1$]."
="Their$_1$ graduates recommended Ken: "Let's apply to [three or more universities]$_1$." "

(15) cannot be captured by Takano's theory under the MTC, but the Equi analysis with the modified assumptions can capture both (14) and (15).

First, consider the derivation of the problematic example (15). The derivation of (15) proceeds as in (21) under the Equi analysis of control:

(21) a. SUBJECT$_{2(b.p.)}$ IO$_3$ [$_{CP}$ [SUBJECT$_{2(b.p.)+}$ SUBJECT$_3$] QP V *(y)oo* C] V
→ b. SUBJECT$_{2(b.p.)}$ IO$_3$ [$_{CP}$ QP [SUBJECT$_{2(b.p.)+}$ SUBJECT$_3$] t_{QP} V*(y)oo* C]V
→ c. SUBJECT$_{2(b.p.)}$ QP IO$_3$ [$_{CP}$ t_{QP} [SUBJECT$_{2(b.p.)+}$ SUBJECT$_3$] t_{QP} V*(y)oo* C]V
→ d. QP SUBJECT$_{2(b.p.)}$ t_{QP} IO$_3$ [$_{CP}$ t_{QP} [SUBJECT$_{2(b.p.)+}$ SUBJECT$_3$] t_{QP} V*(y)oo* C]V
→ e. QP SUBJECT$_{2(b.p.)}$ t_{QP} IO$_3$ [$_{CP}$ t_{QP} [~~SUBJECT$_{2(b.p.)+}$ SUBJECT$_3$~~] t_{QP} V*(y)oo* C]V

<(b.p.) refers to a bound pronoun, and IO refers to an indirect object.>

In (21a), the subject and indirect object in the matrix clause stay overtly under the Equi analysis, and in the case of (15), the bound pronoun is contained in the matrix subject and the embedded subject, and both bound pronouns have to be c-commanded by the QP for the bound variable reading. In the step of (21b), the QP scrambles over the bound pronoun, and therefore this scrambling produces a new binding relation. Then a variable binding reading is successfully allowed in the embedded subject. In the step of (21c), the QP scrambles over the indirect object which does not include the element which has effects on binding. Hence, this scrambling fails to produce a new binding relation. The assumption (20a) indicates that once the QP fails to produce a new binding relation, it never produces them afterwards. Thus in (21d), the QP cannot bind the bound pronoun in the matrix subject. As a result, a bound variable reading in (15) is not available. The application of "chain interpretation" is illustrated in (22).

(22) QP SUBJECT$_2$(b.p.) QP IO$_3$ [$_{CP}$ QP [SUBJECT$_2$(b.p.)+ SUBJECT$_3$] QP V*(y)oo* C]V
{P} { ~~P~~ } {~~P~~ ,A} {~~P~~ ,A}

In the final step of (21e), based on the argument that the ellipsis site can have split antecedents, as argued by Elbourne (2001, 2008), the subject in the embedded clause is deleted. The relevant example in Elbourne (2001, 2008) is the following:

(23) a. Mary needs a hammer. John needs a mallet. They're going to borrow Bill's.
b. They're going to borrow Bill's hammer and mallet.
(Elbourne 2001:277–278, 2008:214)

In example (23a), *a hammer* and *a mallet* are deleted in *Bill's* as shown in (23b). Therefore, the ellipsis site can have two antecedents at the same time. In sum, the derivation under the Equi analysis as in (21) can exhibit the unavailability of the variable binding reading in (15).[4] As a result, scrambling out of a split control clause can be captured under the Equi analysis.

Let us consider other types of scrambling. They can be captured under the Equi analysis of control with my modified assumptions. The first type of scrambling is scrambling out of a control clause which Takano observed. The second type is clause-internal scrambling and long-distance scrambling out of a finite clause.

First of all, an asymmetry of scrambling out of a control clause in example (3) and (4) can be captured without any problem. The derivation of these examples proceeds as shown in (24):

(24) a. SUBJECT IO$_2$ [$_{CP}$ SUBJECT$_2$ QP V C] V
→ b. SUBJECT IO$_2$ [$_{CP}$ QP SUBJECT$_2$ t_{QP} V C] V
→ c. SUBJECT QP IO$_2$ [$_{CP}$ t_{QP} SUBJECT$_2$ t_{QP} V C] V
→ d. QP SUBJECT t_{QP} IO$_2$ [$_{CP}$ t_{QP} SUBJECT$_2$ t_{QP} V C] V
→ e. QP SUBJECT t_{QP} IO$_2$ [$_{CP}$ t_{QP} ~~SUBJECT$_2$~~ t_{QP} V C] V
<IO refers to an indirect object.>

[4] The availability of the variable binding reading in example (14) can be explained under the Equi analysis without any problem. The derivation is shown in (i):

(i) a. SUBJECT$_2$ IO$_{3(b.p.)}$ [$_{IP}$ [SUBJECT$_{2+}$ SUBJECT $_{3(b.p.)}$] QP V *(y)oo* C] V
→ b. SUBJECT$_2$ IO$_{3(b.p.)}$ [$_{IP}$ QP [SUBJECT $_{2+}$ SUBJECT $_{3(b.p.)}$] t_{QP} V*(y)oo* C]V
→ c. SUBJECT$_2$ QP IO$_{3(b.p.)}$ [$_{IP}$ t_{QP} [SUBJECT $_{2+}$ SUBJECT $_{3(b.p.)}$] t_{QP} V*(y)oo* C]V
→ d. QP SUBJECT$_2$ t_{QP} IO$_{3(b.p.)}$ [$_{IP}$ t_{QP} [SUBJECT $_{2+}$ SUBJECT $_{3(b.p.)}$] t_{QP} V*(y)oo* C]V
→ e. QP SUBJECT$_2$ t_{QP} IO$_{3(b.p.)}$ [$_{IP}$ t_{QP} [~~SUBJECT$_{2+}$~~SUBJECT$_{3(b.p.)}$] t_{QP} V*(y)oo* C]V
<IO refers to an indirect object.>

In example (3), the bound pronoun is contained in both the matrix indirect object and the embedded subject. In step (24b), the QP scrambles over the embedded subject which contains the bound pronoun. Then, this scrambling produces a new binding relation, and the variable binding reading for the embedded bound pronoun is allowed. In step (24c), the QP scrambles over the matrix indirect object which contains the bound pronoun. Therefore, again, this scrambling produces a new binding relation, and then the bound variable reading for the matrix bound pronoun is allowed. That is to say, both bound pronouns can be bound by the QP. As a result, the availability of the bound variable reading in example (3) can be explained under the Equi analysis. In contrast, in (4) the bound pronoun is contained in only the matrix subject. The unavailability of the bound variable reading is revealed from the step (24b). The QP scrambles over the embedded subject *Ken* which does not have any effects on binding, and therefore this scrambling fails to produce a new binding relation. Once the QP fails to produce new binding relations, it never produces them afterwards. Thus, in (4) the matrix bound pronoun is not bound by the QP, and hence this example is unacceptable. In sum, the Equi analysis can capture the asymmetry of scrambling out of a control clause.

The second type of scrambling which we need to consider is the well-known asymmetry of clause-internal scrambling and long-distance scrambling out of a finite clause. The relevant examples are (1) and (2). This asymmetry can be easily captured under my modified analysis here. The derivation of (1) is shown in (25):

(25) a. [SUBJECT$_{(b.p.)}$ QP V]
→ b. [QP SUBJECT$_{(b.p.)}$ t_{QP} V]

In this example, the QP undergoes scrambling over the bound pronoun and then this scrambling produces a new binding relation. Therefore, the bound variable reading is allowed, and then this example is acceptable. In addition, the derivation of (2) proceeds as shown in (26):

(26) a. SUBJECT$_{(b.p.)}$ IO [$_{CP}$SUBJECT QP V C] V
→ b. SUBJECT$_{(b.p.)}$ IO [$_{CP}$ QP SUBJECT t_{QP} V C] V
→ c. SUBJECT$_{(b.p.)}$ QP IO [$_{CP}$ t_{QP} SUBJECT t_{QP} V C] V
→ d. QP SUBJECT$_{(b.p.)}$ t_{QP} IO [$_{CP}$ t_{QP} SUBJECT t_{QP} V C] V

In this example, the bound pronoun is contained in the matrix subject. In step (26b), the QP undergoes scrambling over the embedded subject *Ken*, and therefore this scrambling fails to produce new binding relations. Once the QP fails to produce a new binding relation, it never produces them afterwards. Then, the bound pronoun which is contained in the matrix subject cannot be bound by the QP. As a result, the asymmetry of these two scramblings can be captured under my analysis.

Furthermore, we need to consider whether the MTC is really problematic. In the beginning of this section, I proposed to make modifications of Takano's assumptions. Therefore, if we can capture the data which we observed here under the MTC plus my modified assumptions, we cannot claim that the MTC is problematic. As a result, the MTC cannot capture these data, even if my assumptions are adopted, and therefore this observation reinforces the claim that the MTC is problematic.

6 Conclusion

In this paper, I made two proposals: the first proposal is that OC involves an operation "Equi NP Deletion," and the second proposal is that the MTC is problematic in Japanese. On the assumption that the MTC is problematic, we can capture the data in Takano (2009) and the problematic data which we observed. Therefore, this observation supports the assumption that the MTC is problematic in Japanese.

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