Articles

The Availability of Parasitic Gaps and the Presence of Syntactic Movement in Japanese Headed Relative Clauses

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1. Introduction

The question of whether relativization in Japanese involves syntactic movement is an on-debate topic in generative linguistics.[1] Most of the research works that support a syntactic movement of the relative head (Hasegawa 1985, Ishii 1991, Honda 2002, Hoshi 2004a-c, Kitao 2005, 2007, 2009, 2011, Morita 2006, 2013, among others) have examined weak crossover (WCO) effects (1a-b), and reconstruction/connectivity effects (2a-b) to validate their analysis.

(1) a. [[e_i [soitu$_i$-ga e_j hihan-sita] onna$_j$]-o nagutta] otoko$_i$
he-NOM criticized woman-ACC hit man
'the man$_i$ who$_i$ t_i hit the woman he$_i$ criticized'

b. ?*[[[soitu$_i$-ga e_j hihan-sita] onna$_j$]-ga e_i nagutta] otoko$_i$
he-NOM criticized woman-NOM hit man
'the man$_i$ who$_i$ the woman he$_i$ criticized hit t_i'

(Ishii 1991: 41)

(2) a. Katie-wa [[Paul$_i$-ga e_j egaita] [kare-zisin$_i$-no e]$_j$]-o
-TOP -NOM drew himself-GEN picture-ACC
taisoo hosigatta.
very wanted
'(lit.) Katie wanted himself$_i$'s picture that Paul$_i$ drew very much.'

b. Raibaru-wa [[John-ga mizukara e_i hotta] boketu$_i$]-o
rival-TOP -NOM himself dug grave-ACC

totemo yorokonda.

very happy

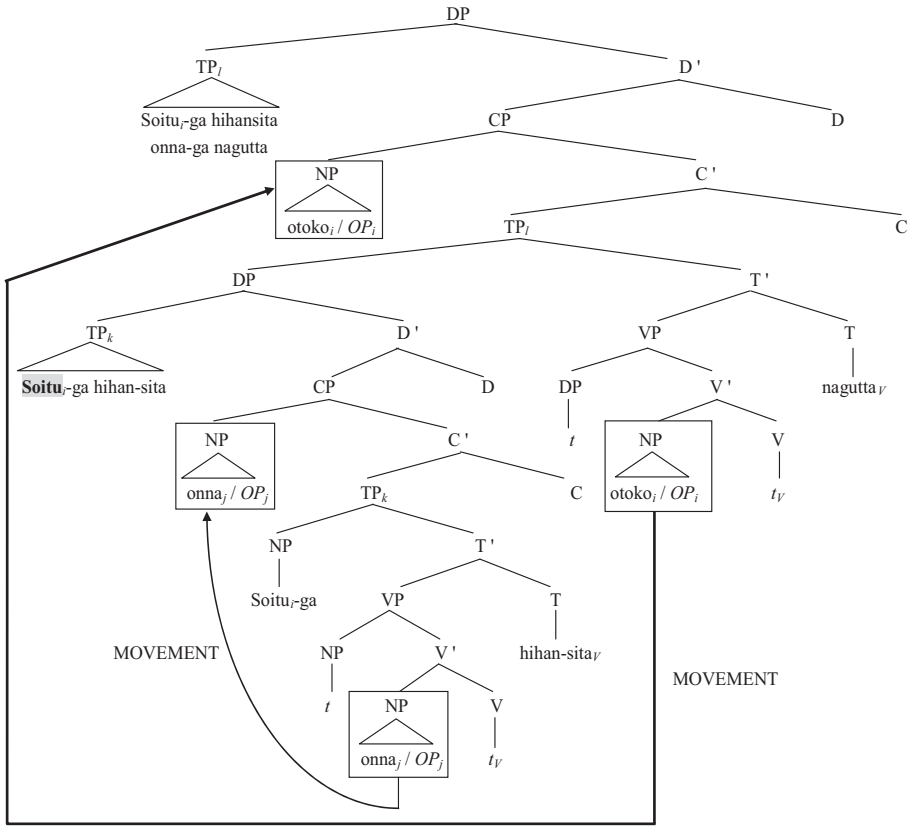
'(lit.) The rival was very happy about the grave that John himself dug.'

(The ruin John himself brought about made his rival happy.)

(Kitao 2011: 318-319)

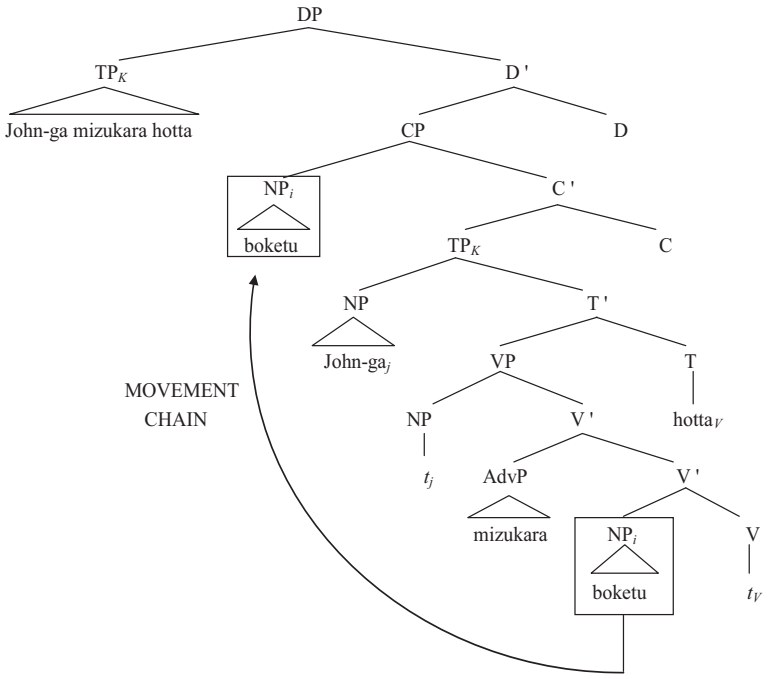
Let us first consider (1a, b), which demonstrate WCO effects. WCO effects, giving rise to degradation in acceptability, are produced by A'-movement of a *wh*-phrase or a quantificational NP in a configuration where the moved element crosses over a coindexed pronominal that does not c-command[2] the extraction site (see Wasow 1972/1979).[3] In (1b), given that the relative head *otoko* 'man' undergoes movement and it crosses over the coindexed pronoun *soitu* 'he,' as represented in (3), the ungrammatical outcome of (1b) can be explained from the perspective of WCO effects, and it signifies that movement of relative head is involved.[4]

(3)



Next let us consider (2a, b), which indicate reconstruction/connectivity effects. In (2a), the anaphor *kare-zisin* 'himself' occurs in the external relative head and can take the subject of the relative clause as its antecedent. This indicates that the external head is reconstructed into the gap position in the relative clause. (2b) retains the idiomatic interpretation *boketu-o horu* 'bring about the ruin.' Given that the external relative head *boketu* is reconstructed into the gap position in the relative clause, it can make a constituent with the verb *hotta* 'dug' and create the idiomatic interpretation. Thus reconstruction/connectivity effects demonstrate that there is a movement chain between the gap position of the relative head and the external relative head position, as indicated in (4).

(4)



Thus WCO effects and reconstruction/connectivity effects demonstrate that syntactic movement is involved in relativization in Japanese. Researchers claiming the presence of syntactic movement of the relative head, however, differ somewhat in respect of the nature of that movement: some scholars argue that null/empty operator movement occurs in the relative clause while others claim that the movement involves promotion/head-raising. The research presented in this paper addresses the availability of parasitic gaps

in Japanese relative clauses, which is regarded as a crucial piece of evidence for the presence of A'-movement in the derivation, and demonstrates that syntactic movement of the relative head is involved in relativization in Japanese from the perspective of parasitic gaps.

This paper is organized as follows: In Section 2, I will examine linguistic data involving parasitic gaps, which are the main theme of this paper, and clarify the characteristics of those gaps. In Section 3, I will demonstrate the presence of parasitic gaps in Japanese by investigating some constructions involving topicalization and clefting. In Section 4, I will examine the availability of parasitic gaps in Japanese headed relatives on the basis of the discussion in Section 3. In Section 5, I will claim that the availability of parasitic gaps in Japanese relative clauses adds to the evidence for the lack of A-scrambling of the relative head in relativization in Japanese, as is argued in Miyamoto (2007) and Kitao (2009, 2011). Section 6 concludes the paper.

2. The Properties of Parasitic Gaps

A parasitic gap is a gap that is dependent on the existence of another gap, which is a trace of a *wh*-type movement, namely a variable. Observe the following examples:

(5) a. Which articles$_i$ did John file t_i without reading e_i? (Chomsky 1982: 38)
b. Which colleague$_i$ did John slander t_i because he despised e_i? (Engdahl 1983: 11)
c. Which boy$_i$ did Mary's talking to e_i bother t_i most? (*op. cit.*, p. 5)

The sentences in (5a-c) contain gaps both in the matrix clause and in an adjunct clause/phrase, and both gaps are coindexed with the displaced *wh*-phrase. The trace in the object position of the matrix verb is a real gap/trace; that is, the dislocated *wh*-phrase occurs in this position and undergoes movement to the sentence-initial position. On the other hand, the gap in the adjunct is dependent on the real gap. As evidence of this, the gap in the adjunct is not licensed, if a trace of the *wh*-phrase does not occur in the matrix clause. Consider (6a, b) :

(6) a. *John filed a bunch of articles$_i$ without reading e_i.

b. *Mary's talking to e_i bothered John$_i$ a lot.

(Engdahl 1983: 12)

In (6a, b), the element coindexed with the gap does not undergo syntactic movement throughout the derivation, and hence no traces of displacement exist in the sentence. Since no syntactic objects license the gap, (6a, b) are ungrammatical.

The following data demonstrate that a resumptive pronoun occurring in the gap position of a displaced element does not license a gap in the adjunct in English.[5] Thus, the trace of *wh*-movement must be left as is, and should not be replaced with a resumptive pronoun.

(7) a. *Which articles$_i$ did John file **them**$_i$ without reading e_i?

b. *Which colleague$_i$ did John slander **her**$_i$ because he despised e_i?

c. *Which boy$_i$ did Mary's talking to e_i bother **him**$_i$ most?

Thus, licensing of the gap in the adjunct, which we have discussed above, is dependent on the trace of displacement in the matrix clause. Considering this property, such gaps in the adjunct are called "parasitic gaps."

Parasitic gaps are not licensed by A-movement like DP-movement. Let us examine (8a, b):

(8) a. *John$_i$ was killed t_i by a tree falling on e_i.

b. *Mary$_i$ seemed t_i to disapprove of John's talking to e_i.

(Engdahl 1983: 13)

In (8a), the DP *John* is passivized and the gap in the adjunct is coindexed with this DP. The ungrammaticality of (8a) indicates that passivization, namely DP-movement, cannot license a parasitic gap in the adjunct PP. In (8b), the DP *Mary* is raised to the matrix subject position. The gap in the adjunct is coindexed with this raised DP, and the sentence is deemed ungrammatical. Since these representations are the same as those in (5a-c), it can be concluded that parasitic gaps are not licensed by A-movement.

Taking the nature of parasitic gaps into consideration, Chomsky (1982) defines the system of licensing of parasitic gaps as in (9):

(9) A parasitic gap is licensed by a variable that does not c-command it.

(Chomsky 1982: 40)

As defined in (9), parasitic gaps must be licensed by variables created by A'-movement, and the variables are required to occur in a position where they cannot c-command parasitic gaps.

The examples in (10a-c) below demonstrate that (9) is correct.

(10) a. *Who$_i$ t_i met you before you recognized e_i? (Chomsky 1986: 54)

b. *Who$_i$ t_i resigned before we could fire e_i? (Lasnik and Uriagereka 1988: 75)

c. *Which boy$_i$ t_i expected me to talk to e_i? (Engdahl 1985: 5)

In (10a-c), traces of *wh*-movement, represented as *t*, occur in the matrix subject position. Since these traces are created by *wh*-movement, that is, A'-movement, they are regarded as variables. However, these traces c-command the parasitic gap in the adjunct, shown as *e*, and hence the variable cannot license the parasitic gap.

Furthermore, the derivational level of A'-movement is strongly related to licensing of parasitic gaps. Let us examine (11a, b):

(11) a. *Who filed which article$_i$ without reading e_i?

b. *Someone filed every article$_i$ without reading e_i?

(Engdahl 1985: 38)

In (11a), the *wh*-phrase *which article* does not move in the S-structure, but undergoes syntactic movement at LF. Since the trace of the LF *wh*-movement does not c-command the gap coindexing with it in the adjunct, there are no conflicts with the definition of parasitic gaps shown in (9) — a parasitic gap is licensed by a variable that does not c-command it. Yet, (11a) yields an ungrammatical outcome. This indicates that LF *wh*-movement cannot license parasitic gaps. (11b) also demonstrates this fact. The QP *every article* does not undergo movement in the S-structure, but does undergo quantifier raising (QR) at LF. The trace of the QR does not c-command the parasitic gap, and hence it meets the licensing requirement of parasitic gaps defined in (9). However, (11b) is

deemed ungrammatical. This demonstrates that QR, a movement that occurs in the LF, cannot license parasitic gaps.

Thus, a parasitic gap can occur in an adjunct clause/phrase only if A'-movement occurs in the S-structure and the trace of the movement does not c-command the parasitic gap. Hence, the availability of parasitic gaps strongly demonstrates that A'-movement occurs in the S-structure and a variable created by the moved element licenses the parasitic gap.

3. The Properties of Parasitic Gaps in Japanese

Taking account of the characteristics of parasitic gaps that we have seen in the previous section, let us now examine the same kind of structures in Japanese and ascertain whether parasitic gaps can occur there.

The availability of parasitic gaps in Japanese was first discussed in Hasegawa (1985). Hasegawa considers a number of constructions to examine the characteristics of null elements in Japanese. Among these, let us now consider the cases in which topicalization, namely a type of A'-movement, is involved in the derivation.

(12) Sono hon$_i$-wa [[t_j e_i hirotta] hito$_j$-ga keisatu-ni t_i todoketa].
that book-TOP found person-NOM police-DAT reported
'That book, the person who found *e* reported *t* to the police.'
(Hasegawa 1985: 304)

In (12a), the NP *sono hon* 'that book' occurs as the object of the matrix verb *todoketa* 'reported' and it is topicalized to the left-edge of the sentence. The NP with a relative clause [[t_j e_i *hirotta*] *hito*$_j$] contains the gap of this topicalized NP, which is represented as e_i. The trace of the topicalized NP, which is represented as t_i, does not c-command the e_i gap, namely, a parasitic gap. This is a typical parasitic gap representation on the basis of the definition in (9) — the trace of an A'-moved element does not c-command a gap in an adjunct that is coindexed with this A'-moved element.

Let us next consider cases in which clefting occurs, which are discussed by Takahashi (2006) and Abe (2011).[6]

(13) a. [[t_j Hazimete e_i atta] hito$_j$-ga t_i kenasita] no-wa
for-the-first-time saw person-NOM criticized NL-TOP
dare$_i$-o desu ka?
who-ACC be Q
'Who was it that a person who saw *e* for the first time criticized *t*?'

b. [[t_j e_i yonda] gakusei$_j$-ga t_i unzarisita] no-wa
read student-NOM got-bored NL-TOP
dono ronbun$_i$-ni desu ka?
which paper-DAT be Q
'Which paper was it that a student who read *e* got bored with *t* ?"

(Abe 2011: 196)

In (13a, b), the gap marked as t_i is a real gap/trace of the clefted NP (*dare-o* 'who' in 13a and *dono ronbun-ni* 'which paper' in 13b). The gap in the relative clause attaching to the subject NP, which is represented as e_i, is coindexed with the clefted *wh*-phrase and its trace t_i. The e_i gap is not c-commanded by t_i, the trace of the clefted NP; it is considered to be a parasitic gap. Thus, the grammaticality of (13a, b) supports the view that the occurrence of parasitic gaps is also permitted in Japanese.

The following also demonstrates that the e_i gap is parasitic. Consider (14a-c) :

(14) a. ?? [t_j e_i hirotta] hito$_j$-ga keisatu-ni sono hon$_i$-o todoketa.
found person-NOM police-DAT that book-ACC reported
'The person who found e_i reported the book$_i$ to the police.'

(Hasegawa 1985: 305)

b. ?* [t_j Hazimete e_i atta] hito$_j$-ga dare$_i$-o
for-the-first-time saw person-NOM who-ACC
kenasita no desu ka?
criticized NL be Q
' (lit.) A person who saw e_i for the first time criticized who$_i$?'

c. ?* [t_j e_i yonda] gakusei$_j$-ga dono ronbun$_i$-ni unzarisita no
read student-NOM which paper-DAT got-bored-with NL
desu ka?
be Q
‘ (lit.) A student who read e_i got bored with which paper$_i$?”
(Abe 2011: 197)

In (14a), the gap e_i in the relative clause is coindexed with the object NP in the matrix clause *sono hon-o* ‘that book,’ which does not undergo movement throughout the derivation. Since there are no variables of A'-movement that license the e_i gap, (14a) is deemed ungrammatical. In (14b, c), the e_i gap in the relative clause is coindexed with the in-situ *wh*-phrase and the *wh*-phrase undergoes movement at LF, but does not move in the S-structure. Hence, (14b, c) have the same type of structure as (11a, b) — LF *wh*-movement cannot license parasitic gaps. Therefore, there are no variables that can license the e_i gap in the S-structure. From this, it is appropriate to regard the e_i gap as parasitic.

The unavailability of an overt pronoun in the e_i gap position also supports the idea that the e_i gap is parasitic. Consider (15a-c):

(15) a. * Sono hon$_i$-wa [[t_j **sore$_i$-o** hirotta] hito$_j$-ga keisatu-ni t_i
that book-TOP that-ACC found person-NOM police-DAT
todoketa].
reported
‘That book$_i$, the person who found **it**$_i$ reported t_i to the police.’

b. * [[t_j Hazimete **soitu$_i$-ni** atta] hito$_j$-ga t_i kenasita]
for-the-first-time him-DAT met person-NOM criticize
no-wa dare$_i$-o desu ka?
NL-TOP who-ACC be Q
‘Who$_i$ was it that a person who saw **him**$_i$ for the first time criticized t_i?’

c. * [[t_j **sore**$_i$**-o** yonda] gakusei$_j$-ga t_i unzarisita] no-wa
it-ACC read student-NOM got-bored NL-TOP
dono ronbun$_i$-ni desu ka?
which paper-DAT be Q
'Which paper$_i$ was it that a student who read **it**$_i$ got bored with t_i?"
(Abe 2011: 196)

In (15a-c), the e_i gap in the adjunct is replaced by an overt pronoun, and (15a-c) are deemed ungrammatical. This means that an overt pronoun cannot appear in the position of a null/empty gap, and hence the gap does not have the character of a pronoun. Hence, it is appropriate to argue that the e_i gap is parasitic.

Thus, parasitic gaps can occur in Japanese, when a trace of an A'-moved element does not c-command the parasitic gap.

4. The Availability of Parasitic Gaps in Japanese Relative Clauses

In Section 3, we observed that parasitic gaps can occur in Japanese, when A'-movement is involved in derivation. Let us then examine whether structures involving parasitic gaps can occur in Japanese headed relative clauses. If a gap coindexed with the relative head and its trace can occur, this demonstrates that the relativization has the nature of A'-movement. Let us examine structures in which a parasitic gap occurs in an adjunct and is not c-commanded by a trace of the movement of a relative head. First, let us consider (16a, b) :

(16) a. [[[Titi$_j$-ga e_i kau-mae-ni] *pro*$_j$ t_i sisyoku-sita] udon$_i$]-wa
Father-NOM buy-before sampled noodle-TOP
Sanuki-san desu.
Sanuki-origin is
' (lit.) The noodle$_i$ [that Father$_j$ sampled t_i [before (he$_j$) bought e_i]] is of *Sanuki* origin.'

b. [[[Musuko-ga e_i yoma-nai-node] hahaoya-ga huruhon'ya-ni
son-NOM read-NOT-because Mother-NOM used bookstore-to
t_i utta] hon$_i$]-wa zituwa kityoo-na mono datta.
sold book-TOP in fact invaluable thing was
'(lit.) The book$_i$ [[that Mother sold t_i to a used bookstore [because (her) son didn't read e_i]] was in fact an invaluable one.'

In (16a, b), there is a gap of the relative head in the matrix clause, which is represented by t_i, and the gap in the adjunct, shown as e_i, has the same index as the external relative head and its gap in the relative clause marked by t_i.[7] Given that the relative head undergoes an operator movement in the S-structure, as shown in (17a, b), (16a, b) have similar representations to (5a-c); that is, A'-movement takes place in the matrix clause, and the gap in the adjunct is licensed by the variable created by the movement. The grammaticality of (16a, b) indicates that Japanese relative clauses have this structure, and this means that the e_i gap should be regarded as parasitic.

(17) a. [[udon$_i$/*OP*$_i$ [Titi$_j$-ga e_i kau-mae-ni] *pro*$_j$ t_i sisyoku-sita] ...

b. [[hon$_i$/*OP*$_i$ [Musuko-ga e_i yoma-nai-node] hahaoya-ga huruhon'ya-ni t_i
utta] ...

Next, let us examine cases in which there are no variables of A'-moved phrases to license a parasitic gap. Consider (18a, b):

(18) a. ?? [[[Titi$_j$-ga e_i kau-mae-ni] *pro*$_j$ **udon$_i$-o** t_k sisyoku-sita]
Father-NOM buy-before noodle-ACC sampled
depaato$_k$]-wa itumo konde-imasu.
department store-TOP always be crowded
'(lit.) The department store$_k$ [that Father sampled **noodle**$_i$ at t_k [before (he) bought e_i]] is always crowded.'

b. ?? [[[Musuko-ga e_i yoma-nai-node] hahaoya-ga **hon**$_i$**-o** t_j
son-NOM read-NOT-because Mother-NOM book-ACC
utta] huruhon'ya$_j$]-wa kono mati-no sinise desu.
sold used bookstore-TOP this town-GEN long-established shop is
'(lit.) The used bookstore$_j$ [that Mother sold **a book/books**$_i$ to t_j [because (her) son didn't read e_i]] is a long-established shop in this town.'

In (18a, b), the gap in the adjunct is coindexed with the NP in the relative clause, which does not undergo syntactic movement throughout the derivation. This representation is the same as (6a, b) —there are no variables to license a parasitic gap. Since a parasitic gap must be licensed by a variable of an A'-moved element, the ungrammaticality of (18a, b) indicates that the gap in the adjunct (e_i) should be regarded as parasitic.[8]

Let us next consider whether the e_i gap in the adjunct can be replaced by an overt pronoun. Witness (19a, b) :

(19) a. * [[[Titi$_j$-ga **sore**$_i$**-o** kau-mae-ni] *pro*$_j$ t_i sisyoku-sita] udon$_i$]-wa
Father-NOM it-ACC buy-before sampled noodle-TOP
Sanuki-san desu.
Sanuki-origin is
'(lit.) The noodle$_i$ [that Father$_j$ sampled t_i [before (he$_j$) bought **it**$_i$]] is of *Sanuki* origin.'

b. * [[[Musuko-ga **sore**$_i$**-o** yoma-nai-node] hahaoya-ga huruhon'ya-ni
son-NOM it-ACC read-NOT-because Mother-NOM used bookstore-to
t_i utta] hon$_i$]-wa zituwa kityoo-na mono datta.
sold book-TOP in fact invaluable thing was
'(lit.) The book$_i$ [that Mother sold t_i to a used bookstore [because (her) son didn't read **it**$_i$]] was in fact an invaluable one.'

In (19a, b), the e_i gap in the adjunct is replaced by the overt pronoun *sore* 'it,' and (19a, b) are deemed ungrammatical. As we have seen in (15a-c) in the previous section, this

means that an overt pronoun cannot appear in the position of a null/empty gap, and hence the gap does not have the character of a pronoun. Therefore, it is appropriate to argue that the e_i gap is parasitic.

Thus, the examples we have seen in this section support the view that the e_i gap in an adjunct, which is not in the c-command domain of a coindexed variable, should be regarded as a parasitic gap. This also strengthens the idea that relativization in Japanese has the nature of A'-movement, since variables are required to license parasitic gaps.[9]

5. The Lack of A-scrambling in Relativization in Japanese

Thus far, we have discussed how parasitic gaps can occur in Japanese relative clauses and this demonstrates that A'-movement is involved in relativization in Japanese. In this section, I will argue that this claim provides another piece of evidence for the lack of A-scrambling in relativization in Japanese, which is argued by Miyamoto (2007) and Kitao (2009, 2011).

The following data reveal that A-scrambling does not occur in the movement of the relative head.

(20) a. * [[Kare-zisin$_i$-no tan'nin-no sensei-ga e_i hometeita]
himself-GEN homeroom teacher-NOM praised-ASP
seito$_i$]-wa zenkoku sakubun konkuuru-de syoo-o totta.
student-TOP national composition contest-in award-ACC got
'(lit.) The student$_i$ that himself$_i$'s homeroom teacher praised got a prize in the national composition contest.'

(Kitao 2011: 329)

b. ?* [[soitu$_i$-ga t_j hihan-sita] onna$_j$]-ga t_i nagutta] otoko$_i$
he-NOM criticized woman-NOM hit man
'the man$_i$ who$_i$ the woman he$_i$ criticized hit t_i'

(Ishii 1991: 41)

In (20a), the antecedent of the anaphor *kare-zisin* 'himself' is the relative head *seito* 'student.' The relative head in the external position, namely the surface position, c-commands the anaphor within the subject NP, but does not occur in the local domain of

the anaphor. Therefore, the anaphor is not locally bound by the relative head in the external position. Hence, if the relative head undergoes A'-movement to Spec-CP, as represented in (21), the fact that the anaphor in (20a) is not governed by the relative head is correctly captured.

(21) [$_{CP}$ seito$_i$ /*OP*$_i$ [$_{TP}$ kare-zisin$_i$-no tan'nin-no sensei-ga t_i hometeita ...

However, if the relative head undergoes A-scrambling before landing in Spec-CP, the relative head, namely the antecedent of the anaphor within the subject NP in the relative head, can bind the anaphor, as demonstrated in (22), and this is not a desirable result.

A-bind

(22) [$_{CP}$ seito$_i$ /*OP*$_i$ [$_{TP}$ t'_i [$_{TP}$ **kare-zisin**$_i$-no tan'nin-no sensei-ga t_i hometeita ...

(20b) shows that relativization in Japanese demonstrates WCO effects. The trace of the relative head *otoko* 'man' does not c-command the pronoun coindexed with it, and hence it induces WCO violation, as indicated in (23).

(23) [$_{CP}$ otoko$_i$ /*OP*$_i$ [$_{TP}$ [soitu$_i$-ga t_j hihan-sita] onna$_j$]-ga nagutta t_i ...

If the relative head directly moves to Spec-CP, it can cross the coindexed pronoun and explain the fact that WCO effects are revealed. However, if the head is A-scrambled to a TP-adjoined position, it can A-bind the pronoun *soitu* and remedy the WCO, as represented in (24). This is not a desirable result, either.

A-bind

(24) [$_{CP}$ otoko$_i$ /*OP*$_i$ [$_{TP}$ t'_i [$_{TP}$ [**soitu**$_i$-ga t_j hihan-sita] onna$_j$]-ga nagutta t_i ...

Considering this fact, Kitao (2009, 2011) claims that the relative head does not undergo A-scrambling in the relative clause in Japanese.

I argue that the fact of parasitic gaps observed above reveals that this analysis is correct—the relative head cannot A-scramble to a TP-adjoined position in its relativization. As we have observed, parasitic gaps are licensed by variables of A'-movement. To form this configuration, the relative head must be raised to Spec-CP without landing in a TP-adjoined position. The following examples indicate that this analysis is correct.

(25) a. * [[[Ryoosin-ga e_i sikaru-mae-ni] kare-zisin$_i$-no tan'nin-no
parents-NOM scold-before himself-GEN homeroom
sensei-ga t_i sikatta] seito$_i$]-wa mattaku hansei-site-inai.
teacher-NOM scolded student-TOP not at all be sorry for-NEG
'(lit.) The student$_i$ [(who) [himself$_i$'s homeroom teacher scolded t_i [before (his) parents scolded e_i]]] is not sorry (for what he did) at all.'

b. [[[Ryoosin-ga e_i sikaru-mae-ni] tan'nin-no sensei-ga t_i sikatta]
parents-NOM scold-before homeroom teacher-GEN scolded
seito$_i$]-wa mattaku hansei-site-inai.
student-TOP not at all be sorry for-NEG
'(lit.) The student$_i$ [(who) [(his) homeroom teacher scolded t_i [before (his) parents scolded e_i]]] is not sorry (for what he did) at all.'

(25a, b) contain a parasitic gap in the adjunct, which is represented as e_i. (25a) contains the anaphor *kare-zisin* 'himself' in the subject NP of the relative clause, whereas (25b) does not contain an anaphor. Although the parasitic gap is not c-commanded by the trace of the relative head, marked by t_i, (25a) is deemed ungrammatical. However, (25b), which does not involve an anaphor, is grammatical. This signifies that the ungrammaticality of (25a) is due to the fact that the anaphor in the subject NP in the relative clause is not bound by its antecedent. That is, the relative head does not undergo A-scrambling in the relative clause.[10]

Thus, the availability of parasitic gaps in Japanese relative clauses provides strong support for the lack of A-scrambling in relativization.[11]

6. Conclusion

In this paper, I have argued that parasitic gaps can appear in Japanese headed relative clauses, which have been debated regarding the presence or absence of syntactic movement of the relative head in relativization. I have claimed that the availability of parasitic gaps indicates that those gaps are licensed by variables of A'-movement of the relative head in Japanese relative clauses. On that basis, I propose that linguistic data that demonstrate the presence of parasitic gaps provide additional strong support for the presence of syntactic movement in relativization in Japanese.[12] I have also demonstrated that an anaphor licensing fact and WCO effects support the view that the movement of the relative head is in an A'-movement fashion, and hence the head does not A-scramble in the relative clause.[13]

Footnotes

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1 Kuno (1973), Murasugi (1991, 2000a, b) and Ochi (1997), among others, advance the view that no movement is involved in Japanese relative clauses.

2 C-command is defined as follows:

(i) Node A c(onstituent)-commands node B if neither A nor B dominates the other and the first branching node which dominates A dominates B. (Reinhart 1976: 32)

3 The examples in (i) illustrate WCO effects:

(i) a. ?* Who$_i$ did Mary talk about his$_i$ sister to t_i?
b. ?* Who$_i$ did the woman he$_i$ loved betray t_i?
(Wasow 1972: 136, 143)

c. ?* Soitu$_i$-no hahaoya-ga dare$_i$-o aisiteiru no?
he/she-GEN mother-NOM who-ACC love Q
'Who$_i$ does his$_i$/her$_i$ mother love?'
(Yoshimura 1992: 14)

d. ?* Soitu$_i$-no joosi-ga dare$_i$-o sikat-ta no?
he/she-GEN boss-NOM who-ACC scolded Q
'Who$_i$ did his$_i$/her$_i$ boss scold?'

In (i c-d), the *wh*-phrase *dare-o* 'who' crosses the pronoun *soitu* 'he/she' when it undergoes covert movement. If the *wh*-phrase does not cross the coindexed pronoun as in (ii a-b), WCO effects do not arise:

(ii) a. Dare$_i$-ga soitu$_i$-no hahaoya-o aisiteiru no?
who-NOM he/she-GEN mother-ACC love Q
'Who$_i$ loves his$_i$/her$_i$ mother?'

(Yoshimura 1992: 14)

b. Dare$_i$-ga soitu$_i$-no buka-o sikat-ta no?
who-NOM he/she-GEN subordinate-ACC scolded Q
'Who$_i$ scolded his$_i$/her$_i$ subordinate?'

This shows that WCO phenomena also exist in Japanese sentences involving *wh*-extraction.

4 Here, following Kayne (1994: 94), I assume that Japanese headed relatives, i.e., N-final relatives, have structures with no overt D^0 for external heads and C^0 for relative clauses.

5 According to Engdahl (1985), resumptive pronouns can license parasitic gaps in Swedish. In (i) below, the resumptive pronoun *han* 'he' occurs in the gap position of the displaced *wh*-phrase, and a gap in the adjunct has the same index as the moved *wh*-phrase and the pronoun in its gap position. The grammaticality of (i) indicates that the resumptive pronoun of the moved *wh*-phrase licenses the parasitic gap in the adjunct.

(i) Vilken fånge$_i$ var det läkarna inte kunde avgöra om **han**$_i$ verkligen
which prisoner was it the-doctors not could decide if he really
var sjuk utan att tala med e_i personligen
was ill without to talk with in person
'Which prisoner was it the doctors couldn't determine if he really was ill without talking to in person?'

(Engdahl 1985: 8)

6 Abe (2011) gives the example of (13a, b) with slight modification of Takahashi (2006: 7).

7 A reviewer pointed out that the example in (16a) may also have the structure given in (i):

(i) [[Titi$_j$-ga [*pro*$_j$ e_i kau-mae-ni] t_i sisyoku-sita] udon$_i$]-wa *Sanuki*-san desu.

However, the choice between the structure given in (16a) and the one represented in (i) does not affect the author's argument. (ii a-b) can be taken as evidence of this idea.

(ii) a. [[Titi-ga [haha-ga e_i kau-mae-ni] t_i sisyoku-sita] udon$_i$]-wa
Father-NOM Mother-NOM buy-before sampled noodle-TOP
Sanuki-san desu.
Sanuki-origin is
'(lit.) The noodle$_i$ [that Father sampled t_i [before Mother bought e_i]] is of *Sanuki* origin.'

b. [[[Titi-ga e_i kau-mae-ni] haha-ga t_i sisyoku-sita] udon$_i$] - wa
Father-NOM buy-before Mother-NOM sampled noodle-TOP
Sanuki-san desu.
Sanuki-origin is
' (lit.) The noodle$_i$ [that Mother sampled t_i [before Father bought e_i]] is of *Sanuki* origin.'

In (ii a-b), the null pronoun (*pro*) is replaced with an overt pronoun, and the sentences are deemed grammatical. This indicates that the existence of two possible structures is irrelevant to the availability of a parasitic gap in (16a).

8 Some native speakers of Japanese whom I asked for grammatical judgment of the sentences in this paper deemed (18a, b) to be acceptable. I think that those speakers unconsciously add the object NP in the gap position and elide it. However, even those native speakers agreed that there is a clear difference in acceptability between (16a, b), where a variable of the movement of a relative head occurs in the relative clause, and (18a, b). Hence, it is sufficient to say that the grammaticality clearly differs between (16a, b) and (18a, b).

9 Adgar and Ramchand's (2005) research supports the idea that relativization in Japanese involves movement. They claim that parasitic gaps are not licensed by base-generated dependencies. As shown below, parasitic gaps are disallowed in Gaelic relative clauses.

(i) *Seo a' chaileag a phòg thu gun a bhith air bruidhinn ris.
this the girl C-REL kissed you without to be after talking to-3M.SG
'This is the girl that you kissed without talking to.'
(Adger and Ramchand 2005: 184)

Adgar and Ramchand (2005) claim that the unacceptability of (i) is due to the fact that the relative head is base-generated and cannot license a parasitic gap in the adjunct.

10 The English example below demonstrates that parasitic gaps cannot be licensed by a passive subject even if that subject moves further to an A'-position. Thus, A-position is not available for parasitic gap licensing.

(i) *Which house$_i$ was sold t_i [before we could demolish e_i] ? (Legate 2003: 511)

11 A reviewer raised the question as to why relativization in Japanese does not allow A-scrambling of the relative head to the TP-adjoined position before it lands in Spec-CP. In Kitao (2011: 330), I showed that an overtly A-scrambled object can c-command an anaphor within the subject NP by providing the following example:

(i) ? [$_{TP}$ (Sono) Seito$_i$-o [$_{TP}$ kare-zisin$_i$-no tan'nin-no sensei-ga t_i
(the) student-ACC himself-GEN homeroom teacher-NOM
hometeita/hometa]]
was praising/praised
' (lit.) the student$_i$, himself$_i$'s homeroom teacher was praising/praised.'
(Kitao 2011: 330)

If the relative head undergoes promotion/head-raising in the sense of Vernaud (1974)/Kayne (1994), it is unclear why a relative head cannot A-scramble to a TP-adjoined position but an overt NP object can. One possibility is that not an overt NP but a null/empty operator is involved in relativization in Japanese, and hence the relative head cannot A-scramble to a TP-adjoined position. On the assumption that Takahashi's (2001) analysis is correct, null/empty operators are unable to undergo A-scrambling unlike their lexical counterparts. Takahashi shows that overtly-moved elements can bind an anaphor and a bound pronoun, while null/empty operators cannot. The contrast between the examples in (ii) and those in (iii) exemplifies this:

(ii) a. *Hanako-wa [otagai$_i$-no gakusei-ga [dare to dare] $_i$-ni aitagatteiru to]
Hanako-TOP each other-GEN student-NOM who and who-DAT want-to-see COMP
iimasita ka?
said Q
'[Who and who] $_i$ did Hanako say that each other$_i$'s students wanted to see?'

b. *Hanako-wa [soitu$_i$-no gakusei-ga dare$_i$-ni aitagatteiru to] iimasita ka?
Hanako-TOP he-GEN student-NOM who-DAT want-to-see COMP said Q
'Who$_i$ did Hanako say that his$_i$ student wanted to see?'

(Takahashi 2001: 50-51)

(iii) a. [Dare to dare]$_i$-ni Hanako-wa [[t'_i [otagai$_i$-no gakusei-ga t_i aitagatteiru]]
who and who-DAT Hanako-TOP each other-GEN student-NOM want-to-see
to] iimasita ka?
COMP said Q
'[Who and who]$_i$ did Hanako say that each other$_i$'s students wanted to see?'

b. Dare$_i$-ni Hanako-wa [[t'_i [soitu$_i$-no gakusei-ga t_i aitagatteiru]] to]
who-DAT Hanako-TOP he-GEN student-NOM want to see COMP
iimasita ka?
said Q
' Who$_i$ did Hanako say that his$_i$ student wanted to see?'

(*op. cit.*, pp. 50-51)

Suppose that null/empty operators must form an operator-variable relation, unlike overt NPs that undergo optional scrambling. In this case, it is quite appropriate to argue that the null/empty operator must move to Spec-CP without landing in a TP-adjoined position and create the operator-variable relation. Given that relativization in Japanese does not demonstrate any A-scrambling behavior of relative heads, we might argue that it involves null/empty operator movement and that promotion/head-raising does not take place in the formation of relative clauses. However, as we have seen in (2a, b), Japanese relative clauses show reconstruction/connectivity effects, which are regarded as crucial evidence for promotion/head-raising (Schachter 1974, Vernaud 1974, Kayne 1994, Bianchi 1999, Sauerland 2000, Aoun and Li 2003, Cecchetto 2006, to name a few). This may imply that relativization in Japanese can be done by either null/empty operator movement or promotion/head-raising, as some scholars argue for English restrictive relative clauses (Sauerland 2000, Aoun and Li 2003, Cecchetto 2006, Hulsey and Sauerland 2006, Cecchetto and Donati 2015, etc.). It has been argued that English restrictive relatives show reconstruction/connectivity

effects with regard to Condition A of the binding theory as in (iv a-c) while they do not show them regarding Condition C as in (v a-c).

(iv) a. The portrait of himself$_i$ that John$_i$ painted is extremely flattering. (Schachter 1973: 32)
b. We admired the picture of himself$_i$ (that) John$_i$ painted in art class. (Aoun and Li 2003: 111)
c. The interest in each other$_i$ that John and Mary$_i$ showed was fleeting. (Schachter 1973: 32)

(v) a. the picture of Bill$_i$ that he$_i$ likes (Munn 1994: 402)
b. The accident of John$_i$'s that he$_i$ will never forget is the one that affected him$_i$ first. (Cecchetto 2006: 26)
c. The pictures of Marsden$_i$ which he$_i$ displays prominently are generally the attractive ones. (Safir 1998)

It is argued in the literature that promotion/head-raising of the relative head creates a movement chain between the relative head and its gap and this makes reconstruction of the head possible, while a null operator moves to the left-edge of the relative clause, namely Spec-CP, and MATCHING, a semantic operation, relates the external relative head and the operator. The *Matching Structure* is given in (vi). An empty/null operator movement in the relative clause creates semantically an open λ-predicate. This is then intersected with the predicate the head expresses (Sauerland 2000: 356).

(vi) a. the book that we read
b. the book λ_x. we read t_x

Since the relative head is not directly moved to the external head position under the matching analysis, relativization does not show reconstruction/connectivity effects as shown in (v a-c).

I leave a thorough analysis of the choice between null operators and promotion/head-raising in relativization in Japanese for future research.

12 A reviewer pointed out the fact that the "long-distance" reconstruction effect with respect to anaphoric binding is not tenable, as argued in Kizu (2005).

(i) a. [Hanako to Taroo$_i$-ga *e* atta] otagai$_i$-no yuujin
Hanako and Taroo-NOM met each other-GEN friend
'(lit.) each other$_i$'s friend that [Hanako and Taro]$_i$ met'

b. [Hanako to Taroo$_i$-ga [sensei-gata$_j$-ga *e* atta to] omotteiru]
Hanako and Taroo-NOM teachers-NOM met COMP think
otagai$_i$/*$_j$-no yuujin
each other-GEN friend
'(lit.) each other$_i$/*$_j$'s friend that [Hanako and Taro]$_i$ think that teachers$_j$ met'

(ii) a. [[Toyota to Mazda]$_i$-ga *e* izonsiteiru] soko$_i$-no keiretu-gaisya
Toyota and Mazda-NOM count-on it-GEN subsidiary
'(lit.) its$_i$ subsidiary that each of [Toyota and Mazda]$_i$ counts on'

b. [subete-no sinbunsya$_i$-ga [[Toyota to Mazda]$_j$-ga *e* izonsiteiru to]
all-GEN newspaper office-NOM Toyota and Mazda-NOM count-on COMP
hoodoo-sita] soko$_i$/*$_j$-no keiretu-gaisya
reported it-GEN subsidiary
'(lit.) its$_i$/*$_j$ subsidiary that all newspaper offices$_i$ reported that each of [Toyota and Mazda]$_j$ counted on'

(Kizu 2005: 151)

The relative clauses of (i-a) and (ii-a) are instances of local relativization, and those of (i-b) and (ii-b) involve the long-distance movement of the relative head. These data demonstrate that the anaphoric pronoun in the relative head position can be coindexed with the highest subject but not with the lower subject. Kizu (2005) calls this effect "highest clause sensitivity."

Since some research has shown that *otagai* is not a pure anaphor (e.g., Hoji 2003), let us create similar examples by using the anaphor *kare-zisin* 'himself.' The examples in (iii) below, which are based on the reconstruction/connectivity example of (2a), reveal that an anaphor in the relative head cannot have the local subject as its antecedent, as Kizu (2005) claims.

(iii) a. ?? [[Katie-ga [[Paul$_i$-ga *e*$_j$ egaita] to] omotteiru] [kare-zisin$_i$-no e]$_j$]-o
Katie-NOM Paul-NOM drew COMP think himself-GEN picture-ACC
taisoo hosigatta.
very wanted
'(lit.) Katie wanted himself$_i$'s picture$_j$ that (she) thought that Paul$_i$ drew *e*$_j$ very much.'

b. [[Katie-ga [[Paul-ga *e*$_i$ egaita] to] omotteiru] [Einstein-no e]$_i$]-o
Katie-NOM Paul-NOM drew COMP think Einstein-GEN picture-ACC
taisoo hosigatta.
very wanted
'(lit.) Katie wanted the picture of Einstein$_i$ that (she) thought that Paul drew *e*$_i$ very much.'

If the anaphor *kare-zisin* does not occur in the relative head, the sentence yields a grammatical outcome, as represented in (iii-b). This means that anaphor licensing makes the sentence ungrammatical.

The reviewer also pointed out that the example in (iv) shows that a "parasitic gap" can occur in long-distance relativization:

(iv) [[Taroo-ga [[ryoosin-ga *e*$_i$ sikaru-mae-ni] tan'nin-no sensei-ga *t*$_i$ sikatta] to
Taroo-NOM parents-NOM scold-before homeroom teacher-NOM scolded COMP
itta]] seito$_i$]-wa mattaku hansei-site-inai.
said student-TOP not at all be sorry for-NEG
'(lit.) The student [(who) Taro said that [(his/their) homeroom teacher scolded *t*$_i$ [before (his) parents scolded *e*$_i$]]] is not sorry (for what he did) at all.'

Since this sentence is acceptable with a parasitic gap, represented as e_i, it must involve long-distance null/empty operator movement if the analysis presented in this paper is correct.

Given that long-distance relativization shows different behavior with regard to anaphor licensing compared to short-distance relativization, and also that parasitic gaps are available in long-distance relativization, I draw a tentative conclusion that null/empty operator movement, but not promotion/head-raising, occurs in long-distance relativization in Japanese, while both strategies of relativization are possible in short-distance relativization as discussed in Footnote 11.

Considering the data of anaphor licensing and parasitic gaps and the difference in syntactic behavior between null/empty operators and promotion/head-raising, long-distance relativization in Japanese may occur in the MATCHING fashion, namely through null/empty operator movement. Clearly more research is necessary to establish the validity of this proposal.

13 A reviewer raised a question as to whether the proposed analysis of parasitic gaps in Japanese headed relatives can account for the ungrammaticality of long-distance "adjunct" relativization in Japanese. It is hoped that my future investigation can provide an explanation for this issue.

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