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Optional Movements Derive Japanese Relative Clauses*

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This paper aims to show that relative clauses in Japanese are derived through two types of movements: scrambling and quantifier floating. Both of them are optional operations in Japanese. After presentation of evidence for movement in Japanese relative clauses, the paper will point out similarities between scrambling and relative clauses, and will claim that movement to CP (complemetizer phrase), spec is scrambling in the derivation of a relative clause in Japanese. Then it will be shown that DP (determiner phrase), spec must be empty for relativization as well as quantifier floating in Japanese, which is necessary in order for NP (noun phrase), not DP, to go through A'-movement via scrambling, and to be reused as the head noun of a relative clause. The present paper, if correct, is significant because it supports movement proposals for Japanese relative clauses and Chomsky's (2007) claim that A'-movement does not involve Agree. Specifically, certain constructions such as relative clauses can be derived via optional movements such as scrambling and quantifier floating.

Keywords: scrambling, quantifier floating, scope interaction, reconstruction effects, the head-raising or promotion analysis

Introduction

The analysis of relative clauses in Japanese has been controversial, because one cannot observe movement or its trace in the constructions. Naturally, there are two kinds of analyses. One is a non-movement analysis, proposed by Perlmutter (1972), Takeda (1999), Murasugi (1991, 2000a, 2000b), Miyamoto (2006, 2007), among others. The other type is a movement analysis. Within the movement analysis, there are two subtypes: one is an operator movement (or matching) analysis proposed by Chomsky (1977) and the other is a promotion (or head-raising) analysis argued by Brame (1968), Schachter (1973), Vergnaud (1974), Åfarli (1994), Kayne (1994), Bianchi (2000a, 2000b), Bhatt (2002), and for Japanese, Hoshi (2004), Kitao (2005, 2009, 2011), Morita (2006, 2008, 2012).

The difference between the two types of movement account is the following. Examine the following sentences first (see Examples (1)-(2)).

Example (1) John talked to the girl who$_i$ he saw t_i yesterday.

Example (2) John talked to the [girl]$_i$ he saw t_i yesterday.

According to the operator movement analysis, a *wh*-expression is an operator and goes through

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A'-movement as in Example (1). In contrast, according to the promotion analysis, the head noun, *girl*, serves as an operator and goes through movement. Thus, in the operator movement analysis, different lexical items are needed for a head noun and an operator, whereas in the promotion analysis, the head noun serves as an operator too. The promotion analysis will be defended and assumed for Japanese relative clauses in the present paper.

This paper will make three new claims. First, A'-movement of a head noun is involved to derive relative clauses in Japanese supporting the movement analysis. Second, the A'-movement is not Agree-based but scrambling. Finally, the same operation as quantifier floating is applied to NP (noun phrase) inside the DP (determiner phrase) so that the NP will be reused as the head noun of a relative clause. This paper is organized as follows. Section "Evidence for Movement" will briefly introduce evidence for and against the movement proposals. Section "Comparison With Scrambling" will compare relative clauses with scrambling. Section "The Quantifier Floating Mechanism in Relative Clauses" will examine how the same mechanism employed for quantifier floating is utilized in the derivation of Japanese relative clauses. Section "The Derivation of a Relative Clause in Japanese" will illustrate a derivation of a relative clause in Japanese and concludes the paper.

Evidence for Movement

In this section, evidence against the movement proposals will be reviewed and refuted first, and then evidence for the movement proposals will be presented.

Data Against the Movement Proposals

(Seemingly) no island effects. The first type of evidence against the movement proposal is apparent lack of island effects. Examine Example (3):

Example (3) [$_{DP}$ [$_{DP}$ [$_{CP}$ e_i e_j kiteiru] [yoohfuku]$_j$]-ga yogoreteiru][sinsi]$_i$]
wearing.is suit-Nom dirty.is gentleman
"(Lit.) a gentleman who the suit that (he) is wearing is dirty" (Kuno, 1973, p. 239, adapted).

Suppose an operator is generated in e_i and goes through A'-movement in Example (3). Then violation of the subjacency condition should follow, but the example is grammatical. Hence, this type of example has been regarded as evidence against the movement proposals.

However, there is an alternative way to derive Example (3), because Japanese allows an additional subject called a major subject in addition to a logical subject. Suppose the operator or *sinsi* ("gentleman") is generated as a major subject as in Example (4a) and goes through relativization as in Example (4b), as argued by Hoshi (2004).

Example (4a) [$_{TP}$ (sono) sinsi$_i$-ga [$_{DP}$ [*pro*$_i$ t_j kiteiru] [yoohuku]$_j$]-ga yogoreteiru].
that gentleman-Nom wearing.is suit-Nom dirty.is
"(that) gentleman is such that the suit that he is wearing is dirty."

Example (4b) [$_{DP}$ [$_{TP}$ t_i [$_{DP}$ [*pro*$_i$ t_j kiteiru] [yoohuku]$_j$]-ga yogoreteiru][sinsi]$_i$].
wearing.is suit-Nom dirty.is gentleman
"(Lit.) a gentleman who the suit that (he) is wearing is dirty" (Hoshi, 2004, p. 117, adapted).

In this case, *sinsi* is not generated within a relative clause, so its movement does not cause violation of the subjacency condition. Hence, Example (3) may not count as evidence against the movement proposals.

(Seemingly) no reconstruction of anaphoric elements. The second type of evidence against the movement proposals is no reconstruction effect of *zibun* (see Example (5)):

Example (5) [1][$_{DP}$[John$_i$-ga e_j taipusita] [<u>zibun$_i$</u>-no ronbun]$_j$]
-Nom typed self-Gen paper
"(Lit.) self$_i$'s paper (that) John$_i$ typed" (Hasegawa, 1988, p. 59).

In Example (5), *zibun* ("oneself") cannot refer to the subject in the relative clause, *John*, so reconstruction of the head noun, *zibun-no ronbun* ("oneself's paper"), is blocked there; hence, no movement of the head noun. However, if another type of anaphoric elements is employed, a reconstruction effect is observed as in Example (6):

Example(6) Mary-wa [[John$_i$-ga e_j taipusita] [<u>karezisin$_j$</u>-no ronbun]$_j$]-o mottekita.
-Top -Nom typed kimself-Gen paper-Acc brought
"Mary brought himself$_i$'s paper that John$_i$ typed" (Ishii, 1991, p. 29).

Zibun will be discussed in detail later.

WCO (Weak crossover). The third type of evidence is WCO. Compare the following pair (see Examples (7a)-(7b)):

Example (7a) [e_1 [soitu$_1$-ga hihansita onna]-o nagutta] otoko$_1$
he-Nom criticized woman-Acc hit man
"the man$_1$ who hit the woman he$_1$ criticized"

Example (7b) *[[soitu$_1$-ga hihansita onna]-ga e_1 nagutta] otoko$_1$
he-Nom criticized woman-Nom hit man
"the man$_1$ who$_1$ the woman he$_1$ criticized hit" (Ishii, 1991, p. 41).

Suppose *otoko* is generated in e_1. Then Example (7b) is expected to result in a case of WCO, because the bound pronoun, *soitu*, c-commands e_1. Nonetheless, Japanese allows A-scrambling. If *otoko* is A-scrambled and placed in front of *soitu* before relativization, it should be grammatical contrary to the fact, which Miyamoto (2007) treats as evidence against the movement accounts.

However, there are two problems with the view. First, although it is a problem to the movement approaches, Example (7) is also a problem to the non-movement approaches. If the head noun *otoko* were base-generated outside the clause in Example (7b), it is in A-position and c-commands *soitu*, so that its bound interpretation should be possible contrary to the fact.

As argued by Morita (2012), the second problem is that if another bound pronoun, *soko*, is used, a different contrast is observed as in Example (8).

Example (8a) [e_i soko$_i$-no juugyoin-o kaikosita] kaisha$_i$-ga tubureta (compared with Example (7a))
there-Gen employee-Acc fired company-Nom went.bankrupt
"a company which$_i$ fired its$_i$ employees went bankrupt"

Example (8b) [soko$_i$-no jugyooin-ga e_i uttaeta] kaisha$_i$-ga tubureta (compared with Example (7b))
there-Gen employee-Nom sued company-Nom went.bankrupt
"*a company which$_i$its$_i$ employees sued went bankrupt" (Morita, 2012, p. 82).

Both Example (8a) and Example (8b) are grammatical as the movement accounts predict. Moreover, there is a reason to believe that *soitu* is not a proper bound pronoun. Consider Example (9):

[1] The asterisk in front of a sentence indicates that the sentence is ungrammatical.

Example (9) Q: Dare-ga soitu-no hahaoya-o aisiteiru no?
who-Nom he-Gen mother-Acc love Q
"Who loves his mother?"
A_1: John desu.
John be
"It's John."
A_2: *John to Taroo desu.
John and Taro be
"It's John and Taro."

As Example (9) shows, it is possible for *soitu* to be bound by *dare* "who", so *soitu* appears to be a bound pronoun. However, it cannot present more than one answer as in A_2, which is not the case in the English counterpart. In contrast, *soko* does not have such a restriction on answers as follows (see Example (10)):

Example (10) Q: Doko-ga soko-no shachoo-o kaikosita no?
Where-Nom there-Gen president-Acc fired Q
"Where fired its president?"
A_1: A-sha desu.
A-company be
"It's A."
A_2: A to B-sha desu.
A and B-company be
"It's A and B."

Accordingly, although the ungrammaticality of Example (7) remains to be explained, the grammaticality of Example (8), which employs a proper bound pronoun unlike Example (7), supports the movement proposals.

Peculiar behaviors of reason/manner adjunct PPs. As Murasugi (1991) discussed, reason and manner adjuncts cannot go through long-distance relativizationas follows:

Example (11a) *[Mary-ga [John-ga t_i okorareta to] omotteiru] riyuu$_i$-o osiete. (Reason PP)
-Nom -Nom was.scolded C think reason-Acc tell.me
"Tell me the reason$_i$ that Mary thinks [that John was scoldedt_i]"

Example (11b) *[[Mary-ga [John-ga t_i sono mondai-o toketa to] itteiru] hoohoo$_i$]
-Nom -Nom that problems-Acc could.solve C say method
-to-wa nan desu ka? (Manner PP)
-P-Top what copula Q
"What is the method$_i$ with which$_i$ Mary says [that John managed to solve the problem t_i]?"

The head nouns, *riyuu* "reason" and *hohoo* "method", cannot be related to the verbs in the embedded clauses, which Murasugi (1991) explained by arguing that the operators for reason and manner never move from their base-generated positions. However, examples against her proposal will be presented later.

Data for the Movement Proposal

Next let us turn to data for the movement proposals. Four types of evidence will be introduced here.

Reconstruction of anaphoric elements. The first type is that *zibun* is actually reconstructed under a certain circumstance as in Example (12):

Example (12) [Mary-ga e_i totta] [zibun$_j$-no shasin]$_i$-ga soko-ni aru (compared with Example (5))
-Nom took self-Gen picture-Nom there-at is
"[Pictures of herself$_j$]$_i$ that Mary$_j$ took t_i are there" (Morita, 2012, p. 77).

As will be discussed in detail in section "The Quantifier Floating Mechanism in Relative Clauses", *zibun* can be reconstructed if it is complement to the head noun.

Scope interaction. Another reason to promote the movement approaches is that scope reconstruction effects are observed in relative clauses in Japanese. Examine Examples (13)-(14):

Examples (13) [kinoo minna-ga t_i zibun-no ie-de mita] eiga$_i$-no namae-o (zenbu) osiete
yesterday everyone-Nom self-Gen home-at saw movie-Gen name-Acc all tell.me
"Tell me all the names of movies that everyone$_j$ watched in his$_j$ house"
"every" >> "names of movies"; "names of movies" >> "every" (Morita, 2006, p. 122)

Examples (14) [$_{CP}$ t_i minna-o tataita] futari-no shoonen$_i$-ga tukamatta
everyone-Acc hit two-Gen boy-Nom was.caught
"The two boys who hit everyone were caught"
only "two boys" >> "every" (Morita, 2006, p. 123)

In Example (13), the universal quantifier *minna* can take either wide or narrow scope with respect to the head noun *eiga* "movie". The fact that the universal quantifier can take wide scope suggests that the head noun is first base-generated in t_i, and then is raised to the surface position. In contrast, Example (14) is unambiguous; that is, the head noun has to take scope over the universal quantifier. This fact is easily accounted for because the base-generated position, t_i, is higher than the universal quantifier in Example (14). Therefore, even after reconstruction of the head noun into t_i, the universal quantifier cannot take wide scope. This type of evidence indicates movement.

Idiom chunks. One of the reasons why the promotion rather than the operator movement approach has been supported in certain cases of English relatives is the existence of relative constructions with idiom chunks. Examine Examples (15a)-(15c), which are due to Schachter (1973, pp. 31-32):

Example (15a) The careful track that she's keeping of her expenses pleases me.

Example (15b) The headway that we made was impressive.

Example (15c) I was offended by the lip service that was paid to civil liberties at the trial.

The head nouns in the examples above are part of idiom chunks: *keep track of*, *make headway*, and *pay lip service to*. Since idioms are supposed to form constituents after their composing items have merged, it is reasonable to assume that the head nouns are first base-generated within the relative clauses and then are raised out of them.

Japanese relative clauses too can be formed with idiom chunks (see Examples (16)-(18)):

Example (16) [[Karera-ga magarinarinimo e_i tuketa] kettyaku$_i$]-wa amari yorokobarenakatta
they-Nom somehow came.to settlement-Top not.so pleasing
"(Lit.) The settlement that they somehow came to was not so pleasing"
"The conclusion that they reached was not so pleasing" (Inoue, 1973, p. 214).

Example (17) Sono eiga-wa [Mary-ga e_i watatta] abunai hasi$_i$-o migotoni saigensita.
that movie-Top -Nom crossed dangerous bridge-Acc elegantly reconstruct
"(Lit.) That movie elegantly reconstructed the dangerous bridge Mary crossed"

"That movie elegantly reconstructed the dangerous action Mary committed" (Morita, 2006, p. 120).

Example (18) Raibaru-wa [[John-ga mizukara e_i hotta] boketu$_i$]-o totemo yorokonda.
rival-Top -Nom himself dug grave-Acc 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, 2009, p. 33).

The relative clauses above are made from idiom chunks such as *kettyaku-o tukeru* (settlement-Acc come.to) "reach a conclusion", *boketu-o horu* (grave-Acc dig) "bring about one's ruin", and *abunaihasi-o wataru* (dangerous bridge-Acc cross) "take a dangerous action". Since these data indicate that nouns themselves go through movement as operators, they argue for the promotion analysis.

Reason/manner adjunct relativization. In section "Peculiar Behaviors of Reason/Manner Adjunct PPs", we have seen that long-distance relativization of reason and manner adjuncts is disallowed, which is in turn used against the movement proposals. However, it is possible if numerals or deictic expressions are added to the head nouns as follows (see Examples (19)-(20)):

Example (19) [Mary-ga [John-ga t_i okorareta to] omotteiru] mittsu-no riyuu$_i$-o osiete. (compared with Example (11a))
-Nom -Nom was.scolded C think three-Gen reason-Acc tell.me
"Tell me the three reasons$_i$ that Mary thinks [that John was scoldedt_i]"

Example (20) [[Mary-ga [John-ga t_i sono mondai-o toketa to] itteiru] rei-no hoohoo$_i$]
-Nom -Nom that problems-Acc could.solved C say that-Gen method
-to-wa nan desuka? (compared with Example (11b))
-P-Top what copula Q
"What is the aforementioned method$_i$ with which$_i$ Mary says [that John managed to solve the problem t_i]?" (Morita, 2012, p. 89).

Although it is not clear why addition of numerals or deictic expressions makes relativization possible, the examples above support the movement proposals.

Comparison With Scrambling

This section will compare relativization and scrambling to show their commonality in terms of reconstruction effects, scope interaction, and reason adjuncts.

First, both constructions allow reconstruction of anaphoric elements as follows (see Examples (21a)-(21b)):

Example (21a) [$_{DP}$ zibunzisin-no shasin-o]$_i$ daremo-ga t_i totta. [scrambling (henceforth, SCR)]
oneself-Gen picture-Acc everyone-Nom took
"(Lit.) Pictures of themselves, everyone took."

Example (21b) [$_{CP}$ daremo-ga t_i totta] [$_{DP}$ zibunzisin-no shasin]$_i$ [relative clause (henceforth, RL)]
"Pictures of themselves that everyone took"

As both Example (21a) and Example (21b) exhibit, the anaphoric element, *zibunzisin*, can refer to subject although the latter is c-commanded by the former, which argues for reconstruction of the anaphoric element.

Second, scope interaction is observed in both constructions as follows (see Examples (22a)-(22b)):

Example (22a) [$_{DP}$ go-satu-izyoo -no hon-o]$_i$ daremo-ga sorezore t_i yonda. [SCR]

five-CL-more.than-Gen book-Acc everyone-Nom individually read

"More than five books, everyone read." more than 5 >> every; every >> more than 5

Example (22b) [$_{CP}$ daremo-ga sorezore t_i yonda] [$_{DP}$ go-satu-izyoo-no hon]$_i$. [RL]

"More than five books that everyone read." more than 5 >> every; every >> more than 5

Japanese does not exhibit scope interaction in canonical order, but it shows scope interaction in the case of scrambling as in Example (22a). As mentioned above, scope interaction is observed in relative clauses as in Example (22b). Moreover, what can be raised in relative clauses is not limited to bare nouns but nouns with numerals as in scrambling. Therefore, both constructions show scope interaction.

Finally, both scrambling and relativization express an interesting similarity in the case of reason adjuncts. Specifically, short-distance operations are allowed in both constructions as follows (see Examples (23a)-(23b)):

Example (23a) [riyuu-mo -naku]$_i$ Mary-ga t_i okotteiru. [SCR]

reason-even-without -Nom angry

"Without a reason, Mary is angry."

Example (23b) [Mary-ga t_i okotteiru] riyuu$_i$ [RL]

-Nom angry reason

"The reason why Mary is angry"

In contrast, long-distance operations are disallowed in both constructions as in Examples (24a)-(24b):

Example (24a) *[riyuu-mo -naku]$_i$ Mary-ga [John-ga t_i sono setu-o sinziteiru to] omotteiru. [SCR]

reason-even-without -Nom -Nom that theory-Acc believe C think

"Without a reason$_i$, Mary thinks [that John believes that theory t_i]" (Saito, 1985, p. 175).

Example (24b) *[Mary-ga [John-ga t_i sono setu-o sinziteiru to] omotteiru] [$_{DP}$ riyuu]$_i$. [RL]

-Nom -Nom that theory-Acc believe C think reason

"The reason$_i$ [that Mary thinks [that John believes that theory t_i]]"

More significantly, addition of numerals makes both types of long-distance operations possible as follows (see Examples (25a)-(25b)):

Example (25a) [$_{PP}$ ikutuka-no riyuu-de]$_i$ Mary-ga [John-ga t_i sono setu-o sinjiteiru to] omotteiru. [SCR]

several-Gen reason-at -Nom -Nom that theory-Acc believe C think

"For several reasons$_i$, Mary thinks [that John believes that theoryt_i]."

Example (25b) [Mary-ga [John-ga t_i sono setu-o sinjiteiru to] omotteiru] [$_{DP}$ ikutuka-no riyuu]$_i$. [RL]

-Nom -Nom that theory-Acc believe C think several-Gen reason

"Several reasons$_i$ [that Mary thinks [that John believes that theory t_i]]"

On the basis of the similarities above, it is plausible to consider that the same type of movement operation is involved in scrambling and relativization in Japanese.

The Quantifier Floating Mechanism in Relative Clauses

The Mechanism of Quantifier Floating

This section will show that the same mechanism for quantifier floating is needed to initiate relativization in Japanese. Let us discuss the mechanism for quantifier floating in Japanese first. Compare the following examples (see Examples (26a)-(26c)):

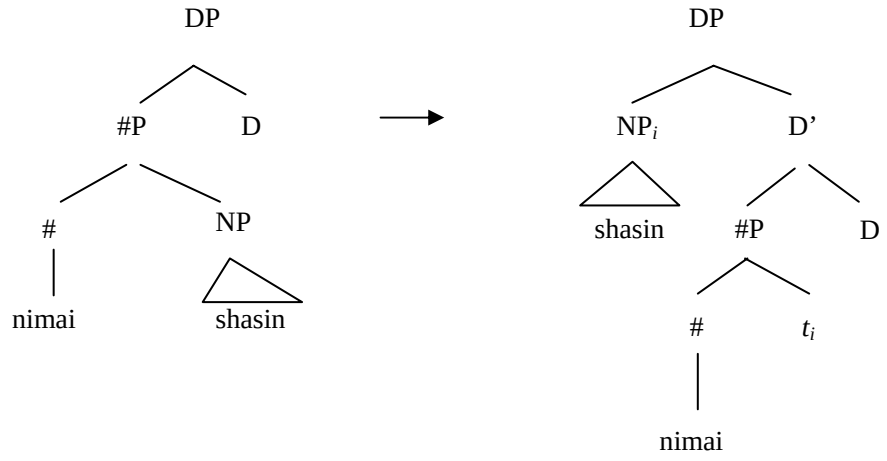
Example (26a) Ken-ga [$_{DP}$nimai-no shasin-o] totta.

-Nom two-Gen pictures-Acc took

Example (26b) Ken-ga [$_{DP}$ shasin-o$_i$ nimai t_i] totta.
-Nom pictures-Acc two took
Example (26c) shasin-o$_i$ Ken-ga [$_{DP}$ t_i nimai] totta.
pictures-Acc -Nom two took
"Ken took two photos."

According to Watanabe (2008), Example (26b) is derived from Example (26a) through movement within DP. Abstracting from his analysis, the derivation is described in the following manner, where case is omitted (see Example 27):

Examples (27)



The movement of NP to DP, spec leads to Example (26b). The NP is subject to further operations and can be scrambled further as in Example (26c). If this analysis of quantifier floating is correct, the spec position of DP must be empty before the movement of NP.

Next, compare the cases when reconstruction of *zibun* is impossible and when it is possible. The relevant examples are repeated below:

Example (5) *[$_{DP}$[John$_i$-ga e_j taipusita] [<u>zibun$_i$</u>-no ronbun]$_j$]
-Nom typed self-Gen paper
"(Lit.) self$_i$'s paper (that) John$_i$ typed" (Hasegawa, 1988, p. 59).
Example (12) [Mary-ga e_i totta] [zibun$_j$-no shasin]$_i$-ga soko-ni aru
-Nom took self-Gen picture-Nom there-at is
"[Pictures of herself$_j$]$_i$ that Mary$_j$ took t_i are there" (Morita, 2012, p. 77).

Let us consider another set of examples (see Examples (28a)-(28b)):

Example (28a) *[$_{CP}$ daremo$_i$-ga t_j totta] [$_{DP}$ zibun$_i$-no nanmaika-no shasin]$_j$
everyone-Nom took self-Gen some-Gen pictures
"Some of their pictures that everyone took"
Example (28b) [$_{CP}$ daremo$_i$-ga t_j totta] [$_{DP}$ nanmaika-no zibun$_i$-no shasin]$_j$
everyone-Nom took some-Gen self-Gen pictures
"Some of their pictures that everyone took"

Example (28a) shows that if *zibun* precedes a numeral expression, *nanmaika* "some", its relativization is blocked. In contrast, if *zibun* does not head DP, its relativization is possible as in Example (28b).

Next, let us examine the examples before relativization to consider their interpretations (see Examples (29)-(30)):

Example (29a) daremo$_i$ -ga [$_{DP}$ zibun$_i$-no nanmaika-no [$_{NP}$ shasin-o]] totta. (compared with Examples (28a))
everyone-Nom self-Gen some -Gen picture-Acc took
*"Everyone took some pictures of themselves."
"Everyone took some pictures which belonged to them."

Example (29b) *daremo$_i$-ga [$_{DP}$[$_{NP}$ shasin-o]$_j$ zibun$_i$-no nanmaika t_j] totta. (Quantifier-floated)

Example (30a) daremo$_i$-ga [$_{DP}$ nanmaika-no [$_{NP}$ zibun$_i$-no shasin-o]] totta. (compared with Examples (28b))
"Everyone took some pictures of themselves."

Example (30b) daremo$_i$-ga [$_{DP}$ [$_{NP}$ zibun$_i$-no shasin-o]$_j$ nanmaika t_j] totta. (Quantifier-floated)
"Everyone took some pictures of themselves."

If *zibun* precedes a numeral as in Example (29a), it is interpreted as a possessive DP such as *their*; thus, it means that everyone took several pictures which belong to them. Furthermore, quantifier floating of *nanmaika* is disallowed as in Example (29b). According to the analysis in Example (27), spec of DP must be empty for quantifier floating to go through. Thus, it is natural to consider that *zibun* in Example (29) is in DP, spec. In contrast, if a numeral precedes *zibun* as in Example (30a), it is interpreted as a complement of *shasin* "pictures"; hence, the sentence means that everyone took some pictures of themselves. Moreover, quantifier floating is possible as in Example (30b), because spec of DP was initially empty.

Coming back to relative clauses of Example (28), it is now clear that quantifier floating and relativization have one aspect in common: DP, spec must be empty. That is to say, *zibun* in Examples (28a) and Example (29) is base-generated in DP, spec, so relativization and quantifier floating are impossible. If this reasoning is correct, the difference of grammaticality between Example (5) and Example (12) follows: The former causes ungrammaticality, because *zibun* is base-generated at DP, spec.

The Reason for Vacating DP, Spec

There are two possibilities why DP, spec must be empty before relativization. One is to assume that a covert operator must be generated there. The other is to claim that NP must be moved to DP, spec for relativization as is the case of quantifier floating in (27).The second possibility seems to be correct, as Example (31) shows:

Example (31) [$_{CP}$ daremo$_i$-ga t_j nanmaika/nimai totta] [$_{DP}$ zibun$_i$-no shasin]$_j$
everyone-Nom some/two took self-Gen pictures
"Some/two of their pictures that everyone took"

The example above shows that relativization and quantifier floating are compatible. As suggested above, spec of DP must be empty for quantifier floating, so if a covert operator is generated in DP, spec for relativization, Example (31) should be ungrammatical contrary to fact. Accordingly, NP must be moved to DP, spec for relativization in Japanese.

Nevertheless, the question of why NP must be raised to DP, spec remains. One way to explain the obligatory movement is to assume that DP is a phase. Then due to Chomsky's (2001) PIC (Phase-Impenetrability Condition), the spec position of DP is visible to the next higher phase. Accordingly, the movement of NP to DP, spec makes it possible for the derivation to notice the existence of NP and scramble and reuse it as the head noun.

Actually, there is another way to account for the movement of NP within DP. When a syntactic operation such as internal Merge and scrambling applies to DP, it normally does so to the whole DP, not NP inside DP, due to its minimal search constraint. In other words, an operation tries to find the closest target in terms of c-command domain (Chomsky, 2008). Since D c-commands NP, DP as a whole is subject to syntactic operations, so NP alone will not be a target for syntactic operations. However, if NP is raised to DP, spec, NP c-commands D and can be subject to operations, which is something akin to the notion of equidistance (Chomsky, 1995). The present proposal is compatible with the second or the third possibility.

The Derivation of a Relative Clause in Japanese

This section will illustrate how a Japanese relative clause is derived and will discuss why Japanese does not employ *wh*-expressions to derive its relative clauses unlike English.

Let us first consider the derivation of Example (32):

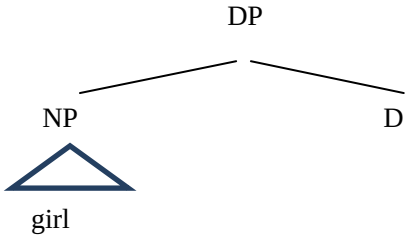
Example (32) John-ga mita shozyo

-Nom saw girl

"A girl that John saw"

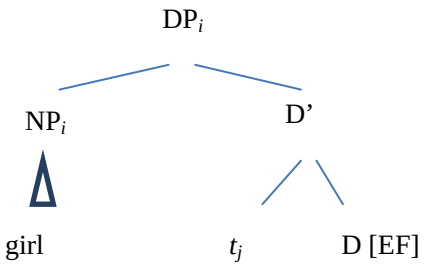
Example (32) is derived as follows, where English words are used:

Step 1: the structure of DP



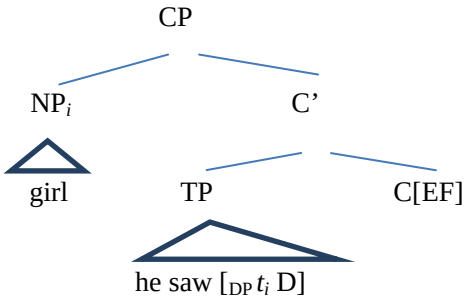
In the case of the DP structure in Japanese, the author assumes an ordinary DP. Thus, there is one NP in complement of D. The DP merges with *saw* and gets its Case feature checked, which is omitted above.

Step 2: quantifier floating in DP (or movement of NP to DP, spec)



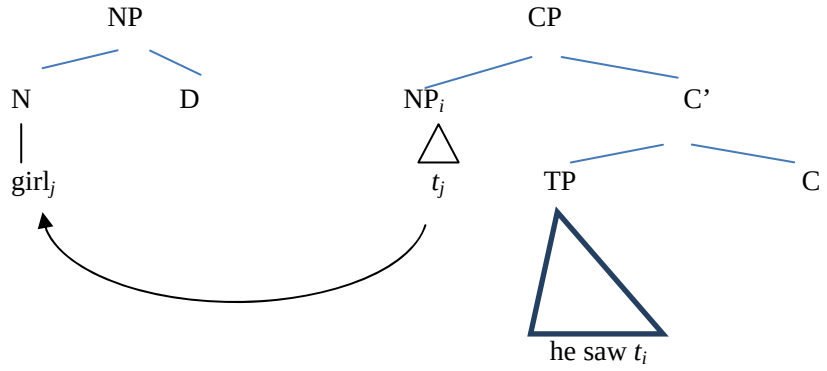
In step 2, NP is raised to DP, spec, which is the same mechanism for quantifier floating. The author assumes the movement is due to an *EF* feature in D following Chomsky (2007). Due to this movement, NP is now subject to further syntactic operations while CP (complemetizer phrase) is being derived.

Step 3: scrambling of NP to CP spec



In step 3, NP is scrambled to CP, spec, which is due to an *EF* feature in C[2]. This operation is possible because NP and DP are equidistance from C, so NP alone can be raised to CP, spec. Moreover, NP is now in spec of CP, so the NP is available for the next phase, *v*P, of the matrix clause. Therefore, in the next step, the NP is still visible for the derivation, and hence can go through sideward movement to merge with a new D.

Step 4: sideward movement and merge with a new D (following Hornstein, 2001).



In step 4, *girl* merges with a new D and forms NP[3].

Step 5: adjunction of CP with DP

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[2] One may wonder whether step 3 (scrambling) can precede step 2 (movement within DP). It seems that the order is forbidden. Compare Eaxmples (a)-(b):

Example (a) [$_{CP}$ *t'*$_j$ daremo$_i$-ga t_j nimaitotta] [$_{DP}$ shasin]$_j$.
everyone-Nom two took pictures

Example (b) ??[$_{CP}$ *t'*$_j$ nimai daremo$_i$-ga t_j totta] [$_{DP}$ shasin]$_j$.
"Two pictures that everyone took."

As observed in Example (31), it is possible to do both quantifier floating and relativization. Thus, a numeral, *nimai* "two", can be left behind as in Example (a). However, it is awkward to leave the numeral at CP, spec, and hence, it is NP, not DP, that goes through A'-movement in Japanese relative clauses.

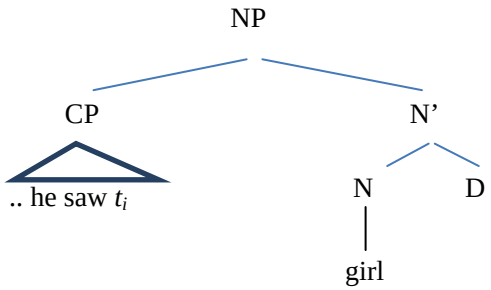
[3] Normally, DP rather than NP is expected to be formed in this case. However, if DP is formed there, CP must adjoin to DP rather than NP, which is not a correct representation as the following contrast shows (see Examples (a)-(c)):

Example (a) The girl John saw came.

Example (b) The one John saw came.

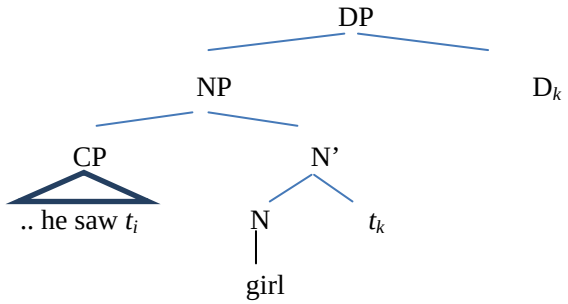
Example (c) The one came.

Examples (a)-(c) illustrate how *one*-replacement is possible in relative clauses. As Example (c) indicates, *girl* and *John saw* make a constituent. Accordingly, CP must adjoin to NP, not DP.



In step 5, CP merges with (or adjoins to) the new NP.

Step 6: excorporation of D (following Saito, 2012)



In step 6, following Saito (2012), D is excorporated and forms DP. This is how the relative clause is derived in Japanese.

Conclusions

Japanese relative clauses are different from English ones at least in terms of two respects. One is that Japanese allows a quantifier floating mechanism, which moves NP to DP, spec. Due to this mechanism, NP rather than DP can be a target of syntactic operations. The second difference is that movement of NP to CP, spec is achieved via scrambling in Japanese, which English does not allow. Due to the PIC, the spec of CP is visible to the next phase, so the noun will go through sideward movement and be reemployed as the head noun of a relative clause. What is important in Japanese relative clauses is that both scrambling and quantifier floating are considered to be optional movements. If so, it is possible to claim that Japanese relative clauses are derived through optional movements, which independently supports Chomsky (2007), who claims that every A'-movement is derived without Agree.

Furthermore, the present account naturally explains why Japanese does not employ *wh*-expressions to derive relative clauses. The reason is that Japanese is a *wh-in-situ* language, so its *wh*-movement is covert. Since a head noun needs to be overtly raised (i.e. the promotion proposal) in Japanese relative clauses, use of covert *wh*-movement is unsuitable[4]. This is why Japanese does not take advantage of *wh*-expressions to derive relative clauses. However, this conclusion does not exclude the use of *wh*-expressions in relative clauses in other *wh-in-situ* languages. For example, Chinese, which is another *wh-in-situ* language, may allow *wh*-expressions under certain circumstances as in Examples (33a)-(33b), which is from Aoun and Li (2003, p. 183):

[4] It remains to see whether Japanese relative clauses allow operator (or matching) operations as in English.

Example (33a) ?zhe jiu shi [[ta juede [ni inggai *ruhe/zenme*$_i$ xiu che] de] fangfa$_i$]
this exactly is he feel you should how fix car DE method
"This is the way$_i$ (how$_i$) he feels you should fix the car t_i."

Example (33b) zhe jiu shi [[women yiwei [ta *weishenme*$_i$ mei lai] de] yuanyin$_i$]
this exactly is we thought he why not come DE reason
"This is the reason$_i$ (why$_i$) we thought he did not come t_i."

Examples (33a)-(33b) show that *wh*-expressions are employed to derive reason and manner adjunct relative clauses. Nonetheless, these examples do not argue against the present paper, because the operator movement (or matching) method, not the promotion analysis, is utilized in the examples, in which case covert movement of *wh*-expressions poses no problem because the head nouns are base-generated in the matrix clauses.

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