

Notes on Head-final Relative Clause Structures

Michio Wada

0. Introduction

This note will consider an Antisymmetric approach to Relative clause structures and some of its consequences in terms of the probe-goal Agree system of Chomsky's (2000,2001) Minimalist syntax. Among other things we will consider the problems of how the Nominative and Genitive-Cases are distributed inside prenominal Relative clauses (so-called *ga-no* conversion phenomena) and why the scope of negation in the DP-domain shows radically different behaviors from that of the CP-domain. We will argue that our system of the prenominal modification structures developed below can shed new light on these problems from the viewpoints of the economy of linguistic computation.

1. Basic Analysis We Propose

Kayne's (1994) Antisymmetry hypothesis assumes the following basic complementation structure for Relative clauses.

(1) $D_0 [_{CP} \text{Spec } C_0 [_{IP} \dots DP/NP \dots$

The Relative head will be derived via the promotion of DP/NP embedded in IP to the Spec of CP. To form a head-final Relative structure, the residual IP will be further raised to the Spec of D_0 . The type of derivation Kayne assumes correctly predicts the lack of Relative complementizers and Relative pronouns in languages with head-final Relative clauses.

In Chomsky's (2000,2001) probe-goal Agree system, syntactic operations are driven by uninterpretable features. Translating Kayne's ideas into Chomsky's probe-goal Agree system, we will assume that C_0 has an uninterpretable Relative feature (Chomsky's (2000) P-feature) and an uninterpretable EPP-feature among other features. We will further assume that DP/NP has an interpretable Relative feature (henceforth R-feature) and some uninterpretable feature, the latter corresponding to uninterpretable Case-features activating DP/NP in the case of A-movement. C_0 probes

for a matching goal in its search domain. Suppose that C_0 and DP/NP match with respect to R-feature. Operation Agree deletes respective uninterpretable features of C_0 and DP/NP. The EPP-feature of C_0 is satisfied by attracting DP/NP to the Spec of C_0 , thus creating the Kaynean promotion head of the Relative clause.

Simpson (2000) argues that Japanese question particles such as *ka* have the syntactic status of expletive particles. Essentially adopting his idea, let us assume that Japanese nominalizing particle *no* is also an expletive particle. Suppose that, instead of DP/NP, this nominalizing expletive particle *no* is merged to C_0 of the schema (1) to delete the EPP-feature of C_0 . Chomsky's (2001) system of Agree has the following requirement:

- (2) α must have a complete set of ϕ -features to delete uninterpretable features of the paired matching element β .

If Chomsky's ϕ -complete thesis of Agree is correct, the nominalizing expletive particle no merged to C_0 deletes the EPP-feature of C_0 , voiding the creation of the Kaynean Relative head in the Spec of CP, but it cannot delete the uninterpretable R-feature of C_0 , since expletives typically lack a complete set of probing features (a complete set of R-features in this case). The R-feature of C_0 then deletes under Agree with DP/NP. The computation will converge, producing a long distance agreement between C_0 and DP/NP, which is basically parallel to the long distance agreement observed in *there*-expletive constructions in English and quirky-subject constructions in Icelandic (Chomsky (2000, 2001)). We claim that the resulting structure essentially underlies both headless and head-internal Relatives on the one hand, and pure nominalization complement clauses on the other, as shown below:

(3) a. Headless Relatives

[_{IP} John-ga pro kat-ta][_C -no]-wa ringo da
 J.-Nom buy-Pst-Nom-Part-Top apple be
 What John bought was (an) apple.

b. Head-internal Relatives

[_{IP} John-ga ringo-o kat-ta][_C -no]-o (minna-de) tabe-ta
 J.-Nom apple-Acc buy-Pst-Nom-Part-Acc everybody eat-Pst
 We all ate apple(s) (which) John bought.

c. Nominalization Complement

[_{IP} John-ga ringo-o kat-te-iru][_C -no]-o mi-ta

J.-Nom apple-Acc buy-be-Nom-Part-Acc mi-ta
 (We) saw John buying apple(s)

To recapitulate, we propose that given the configuration (1), (i) XP-Merge/Move of DP/NP to the Spec of CP derives the headed Relative clause structures, and (ii) X₀-Merge to C₀ of nominalizing expletive particle *no* produces varieties of non-headed Relatives and nominalization complement clauses.

Turning next to the D₀-head of the structure (1), we assume that the D₀-head of the head-final languages possesses multiple specifier positions and the positions are encoded in the EPP-features associated with the D₀-head of the relevant languages. Suppose further that the EPP-feature of D₀-head of head-final languages is satisfied by designated elements such as clausal IPs. Then one of the realizations of the EPP-feature of the D₀-head of these languages will be the Kaynean IP-raised structure, which underlies varieties of prenominal modification structures. The relevant derived structures will be as follow (irrelevant details are omitted):

(4) a. Headed Relatives

[DP [IP ... t_{DP/NP} ...] D₀ [CP DP/NP C₀ t_{IP} ...]

b. Non-headed Relatives (i.e. headless and head-internal Relatives)

[DP [IP ... DP/NP/pro ...] D₀ [CP Spec [C no] t_{IP} ...]

c. Nominalization complement clauses

[DP [IP ...] D₀ [CP [Spec [C no] t_{IP} ...]

In the following sections we will consider some of the consequences and ramifications of our analysis of head-final Relative clause structures proposed above.

2. Immediate Consequences

One of the immediate consequences of our proposed analysis of head-final Relative clauses is the complementary distribution of the Relative head and the nominalizing expletive Relative particle *no*. Consider the next paradigm:

(5) a. [DP [IP John-ga kat-ta] [CP ringo C₀ t_{IP} ...]

J.-Nom buy-Pst apple

(the) apple (which) John bought

b. [DP [IP John-ga kat-ta] [CP [C no] t_{IP} ...]

- J.-Nom buy-Pst-Nom-Part
 what John bought
- c. [DP [IP John-ga ringo-o kat-ta] [CP [c -no] tIP ...
 J.-Nom apple-Acc buy-Pst-Nom-Part
 (the) apple (which) John bought
- d. *[DP [IP John-ga kat-ta] [CP [c -no] ringo tIP ...
 J.-Nom buy-Pst-Nom-Part apple
 (the) apple (which) John bought
- e. *[DP [IP John-ga kat-ta] [CP ringo [c -no] tIP ...
 J.-Nom buy-Pst apple Nom-Part
 (the) apple (which) John bought

(5d) is excluded automatically, given our structure (4) of head-final Relative clauses. The order of *no* and the Relative head *ringo* is simply impossible, since *no* is necessarily merged to the immediate right of the Spec of CP, the position of the Relative head in our system, as assumed in (4b). (5e) is also excluded. The EPP-feature of C_0 is deleted by either the XP-Merge/Move of *ringo* into the Spec of CP or the X_0 -Merge of the particle *no* to C_0 -head, so the chance of simultaneous application of XP-Merge/Move and the X_0 -Merge does not exist in the first place in our model. Note that Japanese is not a language with multiple CP-Spec positions, but a language associated with multiple DP-Spec positions, as we assumed above.

Another immediate prediction our system makes is related to the graded grammatical facts concerning the dependency which obtains across island barriers between the DP/NP in IP and the Spec of CP of (1). Observe the following examples:

- (6) a. *? [DP [IP [Wh-island kodomo-ga t_{present} yorokobu-kadooka] -o shiri-tai] [CP present C_0 tIP] -wa
 kore da
 child-Nom like-whether-Acc know-want present-Top this be
 The present (which) I'd like to know whether (the) child likes is this.
- b. [DP [IP [Wh-island kodomo-ga pro yorokobu-kadooka] -o shiri-tai] [CP [c -no] tIP] -wa
 kono present da
 child-Nom like-whether-Acc know-want-Nom-Part-Top this
 present be
 What I'd like to know whether (the) child likes is this present.

Recall that in the case of the headed Relative (6a), we essentially adopt Kayne's promotion analysis of the Relative head. Thus, to promote to the Spec-position of CP, the Relative head of *present* of (6a) has to move across the wh-island barrier, incurring familiar mild wh-island violations. On the contrary, our system derives (6b) via the direct X₀-Merge of *no* into C₀, involving no movement operation: note that we are assuming that in the case of the headless Relative (6b), *pro* is base-generated inside IP and that semantic construals of *pro* and the position of nominalizing expletive particle *no* invokes no wh-island violation due to their non-movement character (see Wada (in progress)).

Third, our claim that varieties of Relative clause structures and nominalization complement clauses are both derived essentially in the same way will lead us to expect that they are to share some non-accidental syntactic properties. This expectation is also fulfilled. Consider the following contrast:

- (7) a. [DP [IP John-ga/no kat-ta] [CP hon C₀ t_{IP} ...
 J.-Nom/Gen buy-Pst book
 (the) book (which) John bought
- b. [DP [IP John-ga/no ki-ta] [CP [C -no] t_{IP}] -o shiranakat-ta
 J.-Nom/Gen come-Pst-Nom-Part-Acc know-not-Pst
 (We) didn't know that John came
- c. [DP [IP John-ga/*no hon-o kat-ta] [CP mise C₀ t_{IP} ...
 J.-Nom/Gen book-Acc buy-Pst shop
 (the) shop (where) John bought (a) book
- d. [DP [IP John-ga/*no hon-o kat-ta] [CP [C -no] t_{IP}] -o shiranakat-ta
 J.-Nom/Gen book-Acc buy-Pst-Nom-Part-Acc know-not-Pst
 (We) didn't know that John bought (a) book

In (7a, b), *ga* and *no* attached to the subject *John* freely alternate, while in (7c, d) the alternation is barred. The apparent generalization seems to be that the *ga-no* alternation is blocked in case that the raised IP contains an object position. This curious constraint seems to hold both in Relative clause structures and Nominalization complement structures as shown in the contrast between (7a, b) and (7c, d). Apart from the true syntactic nature of the constraint, which we will examine in the next section, the parallel grammatical behaviors of Relative clause structures and Nominalization complement clauses are naturally expected to follow from our uniform syntactic approach (4) to the structures of varieties of Relative clauses and

nominalization complement clauses.

3. *Ga-No* Conversion

As we saw in the previous section, *ga*-Nominative and *no*-Genitive in Japanese freely alternate when the relevant containing clause appears prenominally (i.e. in the Spec-position of D_0 in our framework), insofar as the clause lacks an object position. We repeat (7a) below as (8) for convenience:

- (8) [DP [IP John-ga/no kat-ta] [CP hon C₀ t_{IP} ...
J.-Nom/Gen buy-Pst book
(the) book (which) John bought

What is really puzzling here is that only languages with prenominal modifier clauses show *ga-no* conversion type of phenomena. Languages with postnominal modifier clauses such as English never show the alternation. We will show below that our system we are developing here is to shed new light on the nature of the alternation.

Remember from section 1 that in our system the prenominal IP of (8) sits in the Spec of D_0 due to IP-raising triggered by EPP-feature of D_0 . We will show below a more articulated structure of (8):

- (9) [DP [IP John-ga/no [v kat] [_I-ta]] D₀ [CP hon C₀ t_{IP} ...
J.-Nom/Gen buy-Pst book
(the) book (which) John bought

Suppose that the V-I complex *kat-ta* further raises/merges to D_0 to form a syntactic amalgamate. Hiraiwa (2000) also hypothesizes a raise/merge of V-I complex, not to D_0 but to C_0 , under completely different assumptions from ours. We will consider in the next section why the raise/merge of this type exists in prenominal modifier languages in the first place. Note that the raise/merge of the V-I complex to D_0 targets the head of an extended projection which is non-canonical to the complex category (DP in this case). Let us assume that formal syntactic properties of a functional category get canceled (i.e. become inert) when the category finds itself in a projection which is not a canonical extended projection of the category: for a related idea from the perspective of language change, see Simpson's (2000b) horizontal grammaticalization. Given Chomsky's (2001) assumption that the probe-goal relation is evaluated at the strong phase level after the

relevant syntactic operations are over, the mechanism of the syntactic property cancellation proposed here might be considered to prevent the evaluation of the syntactic relation between the probe V-I complex *kat-ta* and the goal *John* at the stage of the strong phase DP.

If our assumptions are tenable, the structure (9) will change into (10) after the raise/merge of the V-I complex.

- (10) [DP [IP John-ga/no tv-I] [D [v kat] [I -ta] D₀] [CP hon C₀ tIP ...
 J.-Nom/Gen buy-Pst book
 (the) book (which) John bought

Suppose that D₀ then excorporates (from the V-I complex) to remerge to the higher DP, deriving the structure (11):

- (11) D₀ [DP [IP John-ga/no tv-I] [D [v kat] [I -ta] t_D] [CP hon C₀ tIP ...
 J.-Nom/Gen buy-Pst book
 (the) book (which) John bought

D₀ remerges here as a last resort. Recall that we are assuming that the V-I complex loses its syntactic properties due to the raise/merge into the non-canonical extended projection domain. Thus V and I lose their Accusative and Nominative Case-assigning properties respectively. To avoid the problem of backtracking (Chomsky (2001)), D₀ now remerges as a last resort to a higher D₀-position and checks the relevant Cases in prenominal IP as shown in (11). We claim that the remerged D₀ of (11) triggers the *no*-version of the *ga-no* conversion in the prenominal modification domain. In the case of postnominal modifications, the raise/merge of V-I complex and the excorporation of D₀ to produce the conversion never happen since the postnominal modifier languages lack IP-raising in the first place. Thus, given the structure (11), D₀ in prenominal modification languages probes as a Genitive Case assigner into its search domain DP and checks the Genitive *no* on *John*, producing the *no*-version of the *ga-no* conversion.

Returning now to the question of why the *ga-no* conversion occurs only when the prenominal clause lacks an object position, consider the following structure:

- (12) D₀ [DP [IP John-ga/*no hon-o tv-I] [D [v age] [I -ta] t_D] [CP hito C₀ tIP ...
 J.-Nom/*Gen book-Acc give-Pst person

(the) person (who) John gave (a) book (to)

The explanation of the paradigm (12) is straightforward in our model: for the lower D_0 to excorporate and remerge to the higher DP as Genitive Case licenser, the V-I complex necessarily has to raise/merge into a higher non-canonical domain, losing the relevant Accusative-Case assigning property. This is our account of why the Genitive subject is incompatible with the Accusative object in prenominal modification structures: that is to say, the assignment of Genitive Case and the assignment of Accusative Case are simply incompatible in the prenominal IP-structures of our model, since D_0 assigns Genitive Case only when the V-I complex loses the formal property of Nominative and Accusative Case assignment. Note in passing that the multiple Genitive structure exemplified in (13) is properly blocked via the Defective Intervention Constraint (DIC) of Chomsky (2000, 2001), given our excorporation/remerge analysis of the phenomena.

- (13) * D_0 [_{DP} [_{IP} John-no hon-no t_{V-I}] [_D [_v age] [_I -ta] t_D] [_{CP} hito C_0 t_{IP} ...
J.-Gen book-Gen give-Pst person
(the) person (who) John gave (a) book (to)

If the raise/merge of the V-I complex to D_0 is optional as we are assuming throughout the above discussion, the *ga-o* pattern shown in (14) poses no problem either (for the nature of the raise/merge and its optionality, see the next section):

- (14) [_{DP} [_{IP} John-ga hon-o [_v age] [_I-ta]] D_0 [_{CP} hito C_0 t_{IP} ...
J-Nom book-Acc give-Pst person
(the) person (who) John gave (a) book (to)

When the complex does not raise/merge into D_0 , it retains the Case-assigning property of V-I intact, thus properly checking Accusative and Nominative Cases on the relevant DPs respectively. Needless to say, this optionality of the raise/merge of the V-I complex underlies the phenomena of the *ga-no* conversion.

Before turning to the questions of why the raise/merge of the complex exists in the first place and why it is optional, we will consider briefly the phenomena of *ga-no* conversion in Japanese from comparative perspectives. Simpson (2000b) says that modern Korean is essentially a language without genuine Nominative-Genitive conversion. Observe the following examples:

- (15) a. [IP John-i/*uy po-n] os
 J.-Nom/*Gen see-Adnom clothes
 clothes (which) John saw
- b. [IP ecey John-i/*uy sa-n] chayk
 yesterday J.-Nom/*Gen buy-adnom book
 (the) book (which) John bought yesterday

When the subject in the prenominal modifier is marked with Genitive Case, the sentences become grammatically ill-formed in modern Korean as shown in (15). Only Nominative-marked subjects are allowed (for apparent Genitive subjects in prenominal modification domains, see Simpson (2000b)). Assuming that modern Korean has essentially the same prenominal modification structures as Japanese, the structure of (15a) will be as follows:

- (16) [DP [IP John-i/*uy [v po] [I ϕ]] D₀ [CP os C₀ tIP ...
 J.-Nom/*Gen see clothes
 clothes (which) John saw

Suppose that the modern Korean adnominal marker *-n* is merged directly to D₀ and the direct merge of the adnominal marker into D₀ makes the raise/merge of V-I complex unnecessary, as we argue in the next section, then the grammatical contrast between the Nominative Case and the Genitive Case of (16) falls in place. The unraised V-I complex licenses the Nominative Case on *John* IP-internally, and D₀ never needs to resort to the uneconomical excorporation/merge to check the Genitive version of the Case. This is our account for why modern Korean essentially lacks Genitive-marked subjects in the prenominal Relative clause structures.

Turning next to Turkish facts, consider the following example (Kornfilt (2003)):

- (17) [IP Ali-* ϕ /nin geçen gün [v al] -d₁ğ -₁] bu vazò
 A.-*Nom/Gen the other day buy-D₁k -3.sg this vase
 this vase (which) Ali bought the other day

In Turkish prenominal modification domains, only Genitive subjects are allowed, as shown in (17). Under the system we are developing here, the pattern suggests that the V-I complex obligatorily raise/merges into D₀ as shown in (18).

- (18) [DP [IP Ali-* ϕ /nin geçen gün tv] [D [v al] ·d1ğ ·1] [CP bu vaz0 C0 tIP ...
 A.*Nom/Gen the other day buy-D1k-3.sg this vase
 this vase (which) Ali bought the other day

D1k is usually referred to as a nominalizer in Turkish syntax. Kural (1992), however, argues that D1k is a tense-morpheme. If his argument is plausible and Turkish lacks adnominal (nominalizing) morphemes directly merged to D0, the obligatory character of Turkish raise/merge of the V-I complex to D0 will follow from the principle of computation economy, as we show in the next section. The obligatory raise/merge of the complex necessarily deprives the I-morpheme of the syntactic property of Nominative Case assignment due to the raise/merge into the non-canonical extended projection as we assumed above.

4. Economy Considerations

In the previous section, we saw that (i) in modern Korean prenominal Relatives, the subject basically appears only in Nominative Case, (ii) in Turkish the subject shows only Genitive-marking, and (iii) Japanese prenominal Relatives allow both Nominative- and Genitive-marked subjects. We now argue below that the comparative pattern follows from economy considerations of syntactic computation.

Kayne's Antisymmetric approach to prenominal Relative clauses we adopt here critically assumes D0-head, which takes a CP-complement and triggers IP-raising. The D0-head is, however, assumed uniformly regardless of whether the appearance of the D0-node is actually motivated in the languages in question. A conspicuous common syntactic property which Korean, Turkish, and Japanese share is that they typologically lack the category of articles. Suppose then that a principle of economy computation requires the following:

(19) Economy Computation

A syntactic computation crashes when the computation introduces (non-terminal) categories which are never associated with (terminal) lexical items throughout the computation.

Given the economy principle (19), the D0-head, which crucially triggers IP-raising to derive prenominal Relatives in our Kaynean model, cannot remain unassociated with lexical items all through the syntactic derivation. We claim that the principle of

economy computation (19) is the critical driving force behind the raise/merge of V-I complex to D_0 of the previous section.

To review the operation of raise/merge of the previous section from the viewpoints of the principle (19), let us consider first modern Korean. We repeat (16) below as (20):

- (20) [DP [IP John-i/*uy [v po] [I · ϕ]] D_0 [os C_0 tIP ...
 J·Nom/*Gen see clothes
 clothes (which) John saw

D_0 in modern Korean has to observe the principle (19). For the computation to converge successfully, we have two options: (i) the raise/merge (i.e. Move) of the V-I complex to D_0 , and (ii) the direct (pure) merge of a lexical item into D_0 . If other things are equal, the direct merge wins over the raise/merge (Chomsky (2000, 2001)). If Korean adnominal morpheme $-n$ is directly merged to D_0 as we assumed above, the Case pattern of (20) follows. D_0 of (20) meets the condition (19) via the direct merge of the adnominal $-n$, and the unraised V-I complex retains its Case-assigning capacity, licensing the Nominative Case on *John*. Lack of the option of D_0 -remerge as a last resort naturally leads to the correct prediction of the basic unacceptability of the Genitive subject in prenominal Relatives in modern Korean.

Consider next the Turkish case. We reproduce (18) below, slightly modified as (21):

- (21) [DP [IP Ali- ϕ /nin geçen gün tv-1] [D [val] [I d1ğ] ·1 · D_0] [CP bu vazo C_0 tIP ...
 A·Nom/Gen the other day buy-D1k-3.sg this vase
 this vase (which) Ali bought the other day

D_{1k} is an inflectional morpheme representing tense as we saw above (Kural (1992)). If Turkish, unlike modern Korean, lacks a pure adnominal morpheme which is directly merged to D_0 , the economy condition (19) forces the V-I complex to raise/merge to D_0 , thus explaining the obligatory nature of the raise/merge of the V-I complex in Turkish. The obligatory raise/merge of the V-I complex, in its turn, accounts for the contrast in the Case distribution of (21), in terms of the mechanism of the cancellation of Case-assigning property in non-canonical extended projection domains as we assumed in the previous section.

Finally, we will examine what type of explanation our system developed above can offer for the question of why Japanese shows Nominative and Genitive alternation in

prenominal modification domains in sharp contrast to modern Korean and Turkish, namely why the relevant raise/merge of the V-I complex is optional in Japanese. Consider the following structure again (same as (9) of the previous section):

- (22) [DP [IP John-ga/no [v kat] [I-ta]] D₀ [CP hon C₀ tIP ...
 J-Nom/Gen buy-Pst book
 (the) book (which) John bought

Given the structure of (22), the V-I complex has to raise/merge to D₀ to satisfy the economy requirement (19), if nothing else happens to the structure. Suppose that, in modern Japanese, *hon* in the Spec of CP can also raise to D₀ to compete with the raise/merge of the V-I complex. Let us assume further that the position of the V-I complex in the prenominal IP and that of *hon* in the Spec of CP are equidistant from the attracting D₀ (for the technical details of our definition of equidistance, see Wada (in progress)). Then either the V-I complex or *hon* can raise/merge to D₀ to meet the condition (19). If *hon* is chosen to move to D₀, the raise/merge of the V-I complex does not have to occur. We claim that this is the reason why the raise/merge of the V-I complex is optional in modern Japanese.

Now a natural question arises why modern Japanese has the curious process of incorporating the Relative head *hon* to a higher D₀-position as we assumed in the above discussion. Historically seen, the Japanese language in its older stages shows obligatory adnominal forms, which are distinct from conclusive forms, in the configuration of prenominal modification structures shown in (23).

- (23) [IP kaze-no kake-taru/*tari] shigarami
 wind-Gen build-Pst-Adnom/*Concl railings
 (the) railings (which) (the) wind built

Note that the Genitive subject *kaze-no* is licensed by the obligatory presence of the adnominal form *taru*. This necessarily means in our framework that the adnominal V-I complex *kake-taru* is obligatorily raise/merged to D₀ due to the condition of (19) in older stages of the Japanese language.

Now consider the following nominalization complement clause in the adnominal form in older Japanese:

- (24) [IP hito-no u tukai-keru/*keri] -o mite

Person·Gen cormorant use·Pst·Adnom/*Concl·Acc see
seeing people use cormorant(s)

The nominalizing function of the adnominal form in older Japanese as exemplified in (24) is replaced by *no* nominalization in modern Japanese as shown below:

(25) [_{IP} hito-ga u-o tukat-ta] -no -o mite
Person·Nom cormorant·Acc use·Pst·Nom·Part·Acc see
seeing people use cormorant(s)

The appearance of the Nominative subject in (25) indicates in our system that the V-I complex *tukat-ta* stays in IP and is in conclusive form. Why does the modern Japanese V-I complex *tukat-ta* of (25) not obligatorily raise/merge to D₀ as in older Japanese (23) and (24)? Recall from section 1 that we are assuming that modern Japanese nominalizing expletive particle *no* is directly merged to C₀ to check off the EPP-feature of C₀. As discussed in Wada (in progress), this *no* in C₀ and the V-I complex *tukat-ta* in IP are equidistant from D₀ in the Kaynean structure of prenominal Relative clause modification we developed in the previous sections. If *no* raise/merges to D₀ and satisfies the economy requirement of (19), the V-I complex *tukat-ta* need not raise/merge to D₀, and the conclusive form of the V-I complex *tukat-ta* naturally follows. On the other hand, if the V-I complex *tukat-ta* raise/merges to D₀ instead of *no*, the adnominal pattern results as we saw in the previous section (modulo the cancellation of Case-assigning property of the relevant functional category). If our argument thus far is plausible, we can say that the historical development of the nominalizing expletive particle *no* in Japanese syntax opened up a way for adnominal forms and conclusive forms to appear in the same syntactic configuration, i.e. in the prenominal modification structure in the Kaynean sense as developed above. We claim that this isomorphic distribution of adnominal forms and conclusive forms in the history of Japanese language blurred their morphological distinctions and led to the well-known historical merger of the adnominal form and the conclusive form as seen in modern Japanese.

Returning now to the original question of why modern Japanese has the process of raising a Relative head to D₀-position, we say that the optional Relative head incorporation we assumed in (22) was analogically developed in modern Japanese on the basis of the historical process of *no*-raising in the nominalization complement clause, which led to the merger of the adnominal form and the conclusive form in the history of Japanese syntax. The existence of the optional raising of *no* in the nominalization

complement clause and the optional raising of the Relative head in prenominal Relatives successfully accounts for why modern Japanese shows Nominative and Genitive alternation in the domain of the prenominal modification structure, in sharp contrast to modern Korean and Turkish, as we have observed above.

5. Negative Scope

In this final section, we will consider what new light our system of prenominal Relative clause structures developed in the previous sections can shed on the facts of the scope interpretation of Japanese negative particle *nai*. We will especially examine the interaction of scope interpretation between the negative particle *nai* and Japanese universal quantifier elements such as *zen'in* (all). Observe the following data about the interaction of scopal elements in the domain of prenominal Relative clause structures:

- (26) a. [IP (sono party-de) zen'in-ga tabe-nakat-ta] ryoori
 that party-Loc all-Nom eat-Neg-Pst food
 (the) food (which) all didn't eat at that party
 a' all > Neg Neg > all
- b. [IP (sono party-de) zen'in-no tabe-nakat-ta] ryoori
 that party-Loc all-Gen eat-Neg-Pst food
 (the) food (which) all didn't eat at that party
 b' *?all > Neg Neg > all

Almost all the native informants I consulted unanimously accepted the ambiguity in scope interpretation of (26a) as shown in (26a'), while in the case of (26b), nearly two-thirds of them rejected a wide scope interpretation of *zen'in* over Neg as recorded in (26b'). The scope facts must be really surprising if the Genitive subject *zen'in-no* raises covertly from IP to a higher DP to check the Genitive Case as Miyagawa (1993) and others assume. If that is the case, *zen'in-no* is completely outside both the c-command and the m-command domain of the negative particle *nai*, and the prediction of the scope interpretation of (26b) will be reversed contrary to the actual facts shown in (26b').

In the system we constructed in the previous sections, the observed scope facts of (26) will naturally fall in place. Recall from the previous sections that we claim that the V-I complex *tabe-nakat-ta* stays in IP in (26a) on the one hand, and raise/merges to a higher D₀ in (26b) on the other, according as the Case-forms of *zen'in* alternate

between Nominative and Genitive, as shown in (27):

- (27) a. [DP [IP zen'in-ga tabe-nakat-ta] D₀ [CP ryoori C₀ t_{IP} ...
all-Nom eat-Neg-Pst food
(the) food (which) all didn't eat at that party
- b. [DP [IP zen'in-no t_{V-I}] [D [V-I tabe-nakat-ta] D₀] [CP ryoori C₀ t_{IP} ...
all-Gen eat-Neg-Pst food
(the) food (which) all didn't eat at that party

Let us assume that the scopal domain of scope-taking elements is their m-command domain. In (27a) the universal quantifier *zen'in* and the negative particle *nai* m-command each other, since, when associated with Nominative subjects, the V-I complex does not move out from the raised IP in our system. The mutual m-command relation between *zen'in* and *nai* then correctly predicts the scopal ambiguity of (26a) as represented in (26a'). In contrast, in the case of (27b), the negative *nai* raise/merges along with the V-I complex to D₀, escaping from the m-command domain of *zen'in*, which, needless to say, does not move to a higher domain to check the Genitive Case in our model. Thus the negative *nai* uniquely m-commands *zen'in* in (27b), and the unilateral scope of negative *nai* over *zen'in* as reported in (26b') correctly follows in our model, contrary to Miyagawa (1993) and others.

One final puzzle which remains is why the scope interaction in the CP domain shows no scopal ambiguity as shown in the following example (28), as opposed to the clear scopal ambiguity of (26a) in the DP domain we observed above:

- (28) zen'in-ga sono ryoori-o tabe-nakat-ta
all-Nom that food-Acc eat-Neg-Pst
All didn't eat that food

Miyagawa (2001) says that the sentence of (28) has only one scopal relationship where the negative particle *nai* is interpreted inside the scope of the universal *zen'in*. All the native informants I consulted also accepted Miyagawa's scopal judgment of the example (28). If the notion of the m-command domain is a correct characterization of scopal domains of scope-taking elements as we assumed above, why does the sentence (28) not show mutual scopal relations between the universal *zen'in* and the negative particle *nai*, since they apparently m-command each other in (28)?

To attack the problem, let us examine what clues our Antisymmetric approach to

prenominal Relative clause structures has to offer. One of the most salient structural differences between the sentences (26a) and (28) under our theory of prenominal modification structures is that, in the former case, IP is immediately contained in the strong phase of DP due to the Kaynean IP-raising, while in the latter IP is immediately contained in the strong phase of CP. CP strong phases are assumed to differ from DP strong phases in that the former contains multiple layers of functional categories in the traditional domain of C₀ (see Rizzi (1997), Cinque (1999) and Wada (1999) among many others). Suppose then that the evaluation of the CP phase in the sense of Chomsky (2000, 2001) is successful if and only if one of the functional heads in the CP-layers is activated. We assume that functional heads in the CP-layers are activated when they attract nominal elements via EPP-features from within the IP domain and provide structures relevant for the LF-interpretation of the CP phase with respect to its clausal type. We also assume that, in the case of the default activation, the Fin head of the CP-layers (Rizzi (1997), Wada (1999)) is activated and is assigned an EPP-feature by default.

If our assumptions are on the right track, the sentence of (28) will have the following LF-interface structure:

- (29) [CP ... *zen'in-ga* ... [IP *t_{zen'in}* sono *ryoori-o* *tabe-nakat-ta*] ...
 All-Nom that food-Acc eat-Neg-Pst
 All didn't eat that food

Zen'in-ga of the structure (29) raises into the CP-layers due to the activation requirement of the CP phase and is crucially outside of the m-command domain of the negative particle *nai* at the LF interface, where the interpretation of scope-taking elements takes place. The structure shown in (29) then correctly predicts the unilateral scope interpretation of the example of (28). The structure of (27a), on the other hand, retains essentially the same structure at the LF interface, due to the lack of an immediately higher CP-domain. The universal *zen'in-ga* and the negative particle *nai* of the structure (27a) m-command each other, providing for the ambiguous scopal interpretation observable in (26a).

Note that if our accounts of the lack of scope ambiguity in the example (28) are tenable, it will follow from the above argument that when nominals other than the subject *zen'in-ga* raise to the CP domain in the structure of (29), the example of (28) is expected again to show a scopal ambiguity between the universal *zen'in-ga* and the negative particle *nai*. The prediction is borne out as we see in the next sentence:

- (30) a. [CP sono ryoori-ha [IP zen'in-ga t_{ryoori} tabe-nakat-ta] ...
 that food-Top all-Nom eat-Neg-Pst
 That food, all didn't eat
 a' all > Neg Neg > all

Before closing this section, we will review some comparative facts about the interpretation of scope-taking elements in the prenominal modification domain. Consider first the following scope interaction in Turkish:

- (31) a. [IP bütün çocuklar-ın ye-me-diğ-i] yemek(ler)
 All children-Gen eat-Neg-D_{1k}-3.sg(default) food
 (the) food (which) all children didn't eat
 a' *all > Neg Neg > all

The Turkish sentence (31a) has only a wide scope interpretation of the negative particle *me* over the universal *bütün çocuklar* (Zeynep Gençer p.c.). Remember from the discussions in the previous sections that Turkish is typically a language with the obligatory raise/merge of the V-I complex to D₀ in the domain of prenominal Relative clause structures. So in the Kaynean model of prenominal modification we developed above, the structure of (31a) will be (32) below at the LF interface.

- (32) [DP [IP bütün çocuklar-ın tv-I] [D [v ye] [Neg me] [I diğ]-i D₀] [CP yemek(ler) C₀ t_{IP} ...
 All children -Gen eat-Neg-Pst food
 (the) food (which) all children didn't eat

In the structure of (32), the universal *bütün çocuklar* is asymmetrically m-commanded by the negative particle *me* due to the obligatory raise/merge of the V-I complex into the higher D₀. It naturally follows from the structure (32) that a wide scope interpretation of the negative particle *me* over the universal *bütün çocuklar* is the only interpretive option at the LF interface. (The sentence (31a) can have a wide scope interpretation of *bütün çocuklar* over the negative particle *me* when the nominal agreement is in the plural (Öztürk (2004)). For discussion, see Wada (in progress)).

Finally turning to Korean data, observe the following (33):

- (33) a. [IP motun salam-i an-mek-un] umsik

all people·Nom Neg·eat·Adnom food
 (the) food (which) all didn't eat
 a' all > Neg Neg > all

Modern Korean is basically a language where no raise/merge of the V-I complex to Do occurs, as we saw in section 3. The structure relevant for the scope interpretation of the sentence (33a) at the LF interface will be (34):

(34) [_{DP} [_{IP} motun salam-i [_{Neg} an] [_v mek] [_I φ]]] [_D -un] [_{CP} umsik C₀ t_{IP} ...
 all people·Nom Neg·eat·Adnom food
 (the) food (which) all didn't eat

The universal *motun salam-i* and the negative particle *an* are in a mutual m-command relation, since Modern Korean does not have the raise/merge of the V-I complex. Our Kaynean structure (34) then predicts a scopal ambiguity between the two scopal elements, and the prediction is borne out in this Korean case too. Thus we can conclude that the comparative facts about scopal interpretation we reviewed here strongly support our proposed analysis of the head-final Relative clause structure.

5. Conclusion

In this note, we have proposed an Anti-symmetric approach to head-final Relative clause structures under the assumptions of the Minimalist syntax of Chomsky (2000, 2001). We have shown that the model we developed here can account nicely for some of the problematic aspects of head-final Relative clauses both on theoretical and empirical grounds. Among other things, we discussed the phenomena of *ga-no* conversion and scope interaction of scope-taking elements, from the theoretical perspectives of the economy of linguistic computation. We have also reviewed some of the relevant grammatical facts of Turkish and Modern Korean from comparative viewpoints. The comparative facts we reviewed seem to strongly support our system of the prenominal Relative clause structure.

List of abbreviations

1. Acc: Accusative
2. Adnom: Adnominal
3. C: Complementizer
4. Concl: Conclusive
5. CP: Complementizer Phrase
6. D: Determiner
7. DP: Determiner Phrase
8. Gen: Genitive
9. I: Inflection
10. IP: Inflectional Phrase
11. Loc: Locative
12. Neg: Negation
13. Nom: Nominative
14. Nom-Part: Nominalizing Particle
15. NP: Noun Phrase
16. Pst: Past
17. Sg: Singular
18. t: trace
19. Top: Topic
20. V: Verb

References

- Chomsky, Noam. 2000. Minimalist inquiries: The framework. In Roger Martin, David Michaels, and Juan Uriagereka, eds., *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, 89-156. MIT Press.
- Chomsky, Noam. 2001. Derivation by Phase. In Michael Kenstowicz, ed., *Ken Hale: A life in language*, 1-52. MIT Press.
- Cinque, Guglielmo. 1999. *Adverbs and functional heads: A cross-linguistic perspective*. Oxford University Press.
- Hiraiwa, Ken. 2000. On nominative-genitive conversion. *MIT Working Papers in Linguistics* 39.
- Kayne, Richard. 1994. *The antisymmetry of syntax*. MIT Press.
- Kornfilt, Jaklin. 2003. Subject Case in Turkish nominalized clauses. In Uwe Junghanns and Luka Szucsich, eds., *Syntactic structures and morphological information*, 129-215. Mouton de Gruyter.
- Kural, Murat. 1992. V-to(-I-to)-C in Turkish. Ms., UCLA.
- Miyagawa, Shigeru. 1993. LF Case-checking and Minimal Link Condition. In MIT Working Papers in Linguistics 19, 213-254.
- Miyagawa, Shigeru. 2001. The EPP, scrambling, and wh-in-situ. In Michael Kenstowicz, ed., *Ken Hale: A life in language*, 293-338. MIT Press.
- Öztürk, Balkız. 2004. *Case, Referentiality and Phrase Structure*. Ph.D., Harvard University.
- Rizzi, Luigi. 1997. The fine structure of left periphery. In Liliane Haegeman, ed., *Elements of grammar*, 281-337. Kluwer.
- Simpson, Andrew. 2000a. *Wh movement and the theory of feature-checking*. John Benjamins.
- Simpson, Andrew. 2000b. On the reanalysis of nominalizers in Chinese, Japanese and Korean. Ms., SOAS.
- Wada Michio. 1999. *Aspects of the principles and parameters syntax*. Okayama University.
- Wada, Michio. (in progress) *Relatives, Antisymmetry and Minimalism*. Ms., Okayama University.