N'-Gaps, the DP Hypothesis and the Theory of Empty Pronominals*

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0. Introduction

This paper investigates gaps occurring in NP-internal posititons. First, we will look at cases in English and compare them with similar constructions in other languages like Japanese. Then it will be shown that NP-internal gap constructions in English and those in Japanese both involve the same type of empty category in the gap position, which turns out to be empty pronominal *pro*. To argue for this, we will examine the internal structure of NP and see how the DP Hypothesis offers a proper structual basis for the analysis of NP-internal gap constructions. Further, the licensing condition of *pro* in NP-internal positions will be discussed in connection with the *pro*-drop parameter. Finally, binding properties of *pro* will be considered in relation to topic constructions and relative clauses in Japanese.

1. Facts to be Captured

1.1. Characterization of N'-Gaps

It is known that in English a gap can occur within NP. Consider first examples (1)-(3) with gap positions marked by underlines.

(1) John's father hates Bill's __.

(2) These articles are easy to read, but those__ are not.
(3) He has many books but read only a few__.

The gaps of the type illustrated above will be characterized in terms of the occurrence of an element such as a possessive noun, a demonstrative or a quantifier phrase in the pre-gap position and its referential property similar to a pronoun. In traditional terms, this type of gap has been considered to be derived by a deletion rule comparable to VP Deletion or Gapping.[1] More recent studies, however, assume that a certain base-generated empty category is present in the gap postion, though its exact nature has not been fully revealed.[2]

In (1)-(3) the gaps are interpreted as *father*, *articles* and *books* respectively under identity with the head nouns of their antecedent NPs. Therefore, one might consider that the gap of this type represents a head noun. However, if we examine the gap construction in more detail, it turns out that the gap may extend over a wider domain. Consider (4) and (5).

(4) John's [$_{N'}$ blue jacket] is not the same as Bill's [$_{N'}$____].
(5) John read Bill's [$_{N'}$ letter about politics] but didn't read Peter's [$_{N'}$____].

In (4) and (5) the gaps represent *blue jacket* and *letter about politics* respectively, which definitely indicates that their domains include modifiers and/or complements. Thus, the gap position should be taken to be N' rather than N, and we will call the gap an N'-gap. The properties of an N'-gap which we have observed so far will be summarized as follows:

(6) (i) Representing N'
(ii) Preceded by a certain determiner element
(iii) Having referential properties

These characteristics are considered diagnostic of the gaps under discussion so that we find them useful for identifying the related constructions in other languages.

N'-gaps, are also observed in a language like Japanese, though their existence in the language is not uncontroversial. Consider examples (7)-(9).

(7) Mary-wa [$_{NP}$ John-no [$_{N'}$tegami]]-o yonda-ga [$_{NP}$ Bill-no [$_{N'}$____]]-o yonde-inai
Mary-TOP [John-GEN letter]-ACC read-PAST-CONJ [Bill-GEN ____]-ACC read-PRES-NOT
'Mary read John's letter but didn't read Boll's'

(8) [$_{NP}$ sorera-no [$_{N'}$ kuruma]]-ga [$_{NP}$ korera-no [$_{N'}$____]]-o oikosita
[$_{NP}$ those-GEN [$_{N'}$ car]]-NOM [$_{NP}$ these-GEN [$_{N'}$____]]-ACC passed
'those car's passed these cars (on the road)'

(9) [$_{NP}$ takusan-no [$_{N'}$ hon]]-kara [$_{NP}$ ikutuka-no [$_{N'}$____]]-o eranda
[$_{NP}$ many-GEN [$_{N'}$book]]-FROM [$_{NP}$ some-GEN [$_{N'}$____]]-ACC selected
'(I) selected a few from many books'

Putting details aside, the gaps represented in the examples above are similar to those in (1)-(3).[3] Note that they satisfy the diagnostic features of an N' gap given in (6). First, the gap of the type illustrated in (7)-(9) are also assumed to represent N'.[4]

(10) [$_{NP}$ Mary-no [$_{N'}$ akai kutu]]-wa [$_{NP}$ Susan-no [$_{N'}$____]]-yori atarasii

[NP Mary-GEN [N' red shoe(S)]]-TOP [NP Susan-GEN [N'____]]-than new
'Mary's red shoes are newer than Susan's'

Second, the gap is interpreted as identical to the corresponding position of its antecedent NP. In (6), for instance, the gap refers to *tegami* 'letter' which corresponds to the N' within the antecedent NP *John-no tegami*.

In view of the facts presented above, we assume that the constructions in (7)-(9) and those in (1)-(3) fall into the same type of gap construction, and that N'-gaps do exist in Japanese as well as in Eglish. Section Two will show that with respect to the internal structure of NP, there are more striking similarities between these two languages.

1.2. Corestriction

The relation of N'-gaps to antecedents is not precisely the same as that of pronouns (or anaphors) to antecedents. While a pronoun and an antecedent corefer to a particular person or thing, an N'-gap and an antecedent rather refer to a set of persons and things to be further restricted by determiners. To illustrate, compare (11) with (1), repeated here as (12).

(11) John says he hates Bill.
(12) John's father hates Bill's____

In (11), *he* and *John* can be coindexed and corefer to the same individual named *John*. In (12), however, this type of coreference is not available for the relation between the gap and its antecedent *father*; i.e.,the gap dose not refer to the same person as the father referred to in *John's father* but denotes a class of individuals which the noun *father* possibly denotes. It is not until the maximal projection is reached where the genitive *Bill's* is available that the particular referent, namely *Bill's father*,

is identified. To distinguish this type of gap-antecedent relation from pronominal coreference, we may call the former *corestriction*.

1.3. Relevance to theoretical issues

The observations made above raise several interesting questions about their relevance to theoretical issues. One which immediately comes to mind is the question of what the real nature of N'-gaps is. For obvious reasons an N'-gap must be identified with some sort of empty category, so it is either PRO, *pro* or a trace. The possibility of its being a trace will immediately be discarded, for there is no indication that movement is involved in relevant cases. Therefore, we will restrict ourselves to the other two possibilities; namely, the possibilities of PRO and *pro*.

Originally the PRO analysis of N'-gaps was proposed by Belletti and Rizzi (1981) in connection with empty subjects in Italian. They claim that in Italian the empty position internal to a subject NP quanitified by a numeral should be occupied by PRO, as (13) shows.

(13) [$_{S'}$[$_{S}$[$_{NP}$ tre PRO] [$_{VP}$ passano rapidamente]]]
three PRO elapse rapidly
Belletti and Rizzi (1981), 122, (7)

Their basic assumptions leading to the conclusion just mentioned are summarized as follows:

(14) (i) Non-peripheral positions within NP are not prevented from external government.
(ii) The subject position is not govefned in Italian.

In (13) the subject NP is not governed; hence, its head position is not governed either. In consequence, PRO may appear in this position. Note

that Belletti and Rizzi's theory as summarized in (14) not only allows PRO to appear in a configuration like (13) but also prevents the occurrence of PRO in object position. For obvious reasons the object possition is a governed position, so that the head position of an object NP is also governed due to (14i). Hence, PRO cannot appear in that position. Consider the following examples taken from Belletti and Rizzi.

(15) a.* Gianni trascorrerā tre PRO a Milano
'Gianni will spend three PRO in Milano'
b. Gianni ne trascorrerā tre ____ a Milano
'Gianni will clitic spend three ____ in Milano'
Belletti and Rizzi (1981)

(15b) indicates that an empty category may appear within an object NP if it occurs with a clitic *ne*. However, this empty category cannot be PRO but must be a trace since the clitic *ne* is assumed to bind a trace left by its movement to a V-adjoined position.

Although their arguments apply for cases like (13), it turns out that there are many other cases which Belletti and Rizzi's theory cannot account for. In particular N'-gaps freely occur in object position as well as subject position in many languages including Japanese and English. If we adopt the PRO analysis of N'-gaps, then we would be forced to abandon Belletti and Rizzi's assumption (14i) above and assume instead that the N'-gaps position is ungoverned not because the NP dominating it occurs in an ungoverned position but because only the N' position in which a gap appears is exempt from government. The assumption that N' positions are always ungoverned appears too strong.

Contrary to Belletti and Rizzi's assumption, there is evidence that N' positions are governed. To see this , let us consider how Case is realized on elements internal to an NP in German.

(16) a. Der Junge ging nach München.
'The boy went to München'
b. Hans schlug den Jungen.
'Hans beat the boy'

Note that Case realization not only affects determiners but also nominal heads. Maintaining the standard assumption that Case is assigned under government by a Case assigner, this indicates that government penetrates into head positions. If PRO were allowed to appear in N' positions, one might assume that a certain class of specifiers create barriers to government in N' positions, making it possible for PRO to appear there.

The *pro* analysis, on the other hand, was proposed by Olsen (1987) to account for the nominal gap cases in German. Though she takes gaps to be nominal heads but not N-bars, her arguments are primarily based on parallelism between NP and S with respect to the role of inflectional elements.[5] She argues that *pro* is licensed in the head position of NP by an inflectional suffix of a preceding adjective just as it is licensed in subject position in *pro*-drop languages by ϕ-features phonetically realized on AGR elements. To illustrate this, let us consider the following.

(17) a.* $[_{NP}\ [_{N'}\ [_{N}\ PRO]]]$
b.* $[_{NP}\ [_{N'}\ [_{N}\ \textit{pro}]]]$
c. $[_{NP}\ [_{N'}\ [_{AP}\ Alleinerziehende]\ [_{N}\ pro]]]$

(18) $[_{S}\ [_{NP}\ [_{N'}\ [_{N}\ \textit{pro}]]]\ [_{VP}\ parla]]$

The first two cases in (17) are not possible in German. The structure in (17a) is ruled out because the head position is governed. The structure in (17b) is not well-formed because *pro* is not locally governed by grammatical features. In contrast, (17c) is well-formed due to the

presence of an adjective in the position immediately followed by *pro*. The strong correlation between the occurrence of a null element and the form of its preceding adjective indicates that the grammatical content of *pro* is locally determined by the inflectional ending *-e* which the participial adjective *Alleinerziehend* bears. Similarly, in cases like (18), the content of *pro* is locally determined by the inflectional suffix of the verb. Olsen claims that in both the null subject cases and the NP-internal gap cases, the role of inflectional endings in licensing null elements is crucial, and that the NP-internal gap is an instance of *pro*, which appears in the head of NP, licensed in exactly the same way as it is in null subject position.

From the course of discussion that we have followed so far, we may conclude that empty N'-positions should be occupied by *pro* but not PRO[6]. In the next section, we will see how the *pro* analysis is consistent with the DP hypothesis, an alternative approach to the structure of NP.

2. The DP Hypothesis

In this section, the theoretical issues presented so far will be discussed in conjunction with the internal structure of nominal projections. First of all, note that apart from the question of whether the gap position is governed or not, the standard analysis of NP is incapable of properly capturing the role of specifiers which must be crucial in determining the occurrence of N'-gaps: i.e., a specifier must be either a governor or something which blocks government of N'-gap positions. In the standard analysis of the structure of NP, however, neither of these effects are expressible in any direct, straightforward way. Unless we assume the specifier to be a governor, the relation between a specifier and a nominal head remains vague.[7] In order to avoid unnecessary alterations to fundamental notions such as government while attempting to express the important role of specifiers in a nontrivial way, the structural

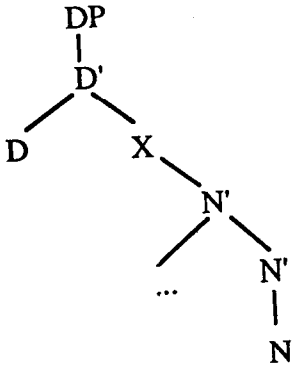
relation between a specifier and N'-gap itself must be defined in terms of a more crucial relation such as government with or without a barrier to government between them. Embodying this idea, the DP hypothesis is expected to shed light on the problems confronted here.[8]

2.1. Structure of DP

2.1.1. D projections and N projections

The basic idea behind the DP hypothesis is that determiners should have independent categorial status.[9] Along this idea, a schematic representation of DP will be as follows:

(19)



As for the projection level to be assigned to X, however, two different analyses have been proposed:

(20) (i) X = NP
(ii) X = N'

Abney's (1985, 1986) original analysis is based on (20i), which takes the complement to D to be maximal projection NP.[10] In contrast, Fukui (1986), among others, proposes an analysis based on (20ii). As we will

see later, these two analyses make quite different predictions about the domain of government by D within DP, which is crucial in our discussions of N'-gaps. Now we will discuss each of the possibilities in (20).

One argument in favor of (20i) is its consistency with the standard X-bar schema, which states that every category projects up to a maximal projection. In other words, both D and N are subject to the same projection schema, projecting to maximal projections. As a consequence, D takes NP as its complement in the way that V takes NP as its complement: i.e., D-projections and N-projections are independent projection lines.

However, it turns out that a head and its complement have a unique relationship. For instance, D uniquely selects NP as its complement and I take. VP as its unique complement. Such dependency between a functional head and its complement must be stated in grammar. With regard to this question, Abney (1985) argues that the relations between D and N are semantic ones. However, this analysis leaves a few important things unexplained. First, questions arise with the role of specifiers of NP. In the spirit of the DP hypothesis, what used to be the specifier of NP is analyzed as the head of DP, so there is no need for postulating the specifier position for NP. Second, the analysis based on (20i) is not capable of accounting for certain syntactic differences between D-projections and N-projections: for instance, D' does not iterate while N' does.

On the other hand, the analysis besed on (20ii) assumes that lexical categories such as N and functional ones such as D project differently. According to Fukui (1986), lexical categories project iteratively to a single bar level while functional categories project up to maximal projection. Thus, dependency between these two types of categories can

naturally be explained in purely syntactic terms without resorting to any semantic notion.

In support of (20ii), van Riemsdijk (1987c) proposes a principle which, based on the ideas presented in van Riemsdijk (1987a, b), is intended to constrain well-formed projection lines. He formulates the principle in the following way.

(21) *[αN, βV, +max] if dominated by [αN, βV, -max] on the same projection line.

(van Riemsdijk 1987c)

(21) states that maximal projections should not be dominated by nonmaximal projections with the same feature specifications with respect to N and V. Assuming that D- and N-projections constitute the same projection line differing only in the feature specification for [±F(unctional)], NP should not be immediately dominated by D', since both N and D are specified for [+N, -V]. In contrast, N' is allowed to be dominated by D' because both N' and D' are negatively specified for [±max]. Further, (21) is a principle not only on nominal projections but also on verbal projections, whereby similarities between the relation of D-projections to N-projections on the one hand and that of I-projections to V-projections on the other are captured in an attractive way.

Considering the discussions advanced so far, we assume that an appropriate analysis of the structure of DP should take X to be N' but not NP. From this it follows that the gap position must be governed, for a non-maximal projection cannot be a barrier to government.[11]

The refore the gap is *pro* but not PRO. We will later return to this issue and present some additional arguments against the PRO analysis.

2.1.2. Genitive Raising

In order to see how a DP is assigned Case, we will consider properties of the Case-making mechanism which appears to play a crucial role in our further discussions. In the first place, it should be noted that under the present approach, the nominal head is not directly Case-marked. It is rather assumed that Case is transferred to a nominal head via a functional head. Consider the schematic representation in (22).

(22) ...X [$_{DP}$...[$_{D'}$ Y [$_{N'}$... Z...]]]

In (22) X stands for a Case assigner which assigns Case to DP, Y a functional head, and Z a nominal head. Then, Z cannot be governmed by X but can only be governed by Y since government of Z by X should be prohibited by the Minimality Condition. Maintaining Belletti and Rizzi's assumption that only non-peripheral positions are governed, Case is assigned to Y by X under government and transmitted to Z under another government relation. There is evidence for this Case-marking mechanism.

(23) a. das Auto
b. des Autos
c. dem Auto
d. das Auto

The paradigm in (23) shows that in a language like Garman Case inflections are most strongly realized on articles whereas they are weaker on nouns.

The specifier position of DP allows another DP to occur, which functions as a possessive (or genitive) phrase in English. As has often been discussed in the literature, genitive Case is assumed to be inherernt,

assigned to a DP whenever the DP is not governd by a lexial Case assigner. Then genitive can be thought to be a kind of default Case; hence, the DP in the specifier position automatically obtains genitive Case in English. Consider a phrase such as *the car's fender*, which has a structure like (24) at D-structure.

(24) $[_{DP}\ [_{DP}\ [_{D'}(+DEF, +GEN)\ [_{N'}\ car]]]\ [_{D'}(+DEF, +X)\ [_{N'}\ fender]]]$

Each of the D positions is represented as a set of features; the embedded D is specified for [+DEF(inite), +GEN(itive)], and the matrix D is specified for [+DEF, +X]. The feature [+X] represents either [+NOM(inative)], [+OBJ(ective)] or [+OBL(ique)], depending on which position the DP occurs in[12]:

(25) (i) [+X] is [+NOM] if the DP occurs in the position governed by I
(ii) [+X] is [+OBJ] if the DP occurs in the position governed by V
(iii) [+X] is [+OBL] if the DP occurs in the position governed by P

In English these case features do not affect the form of articles; when associated with [±DEF] it is realized either as *the* or *a*. Other forms depend on what features are added: when specified for [+DEM(onstrative), +PL(ural)] in addition to [+DEF], for instance, D will be realized as either these or those.

Suppose that the feature [+GEN] moves from the head of the specifier DP to the head D of the higher DP. Then this feature is associated with the Case feature [+X] originally present in the higher D position. As a result, the feature matrix of the higher D becomes [+DEF, +X,

+GEN,...]. In this case, the combination of the feature [+GEN] with another Case feature makes its own realization possible. This is actually spelled out as -'s. This property of Case realization is not unreasonable because in a language like German, when a genitive pronoun appears, it always combines with the Case feature assigned to the higher DP to produce forms such as sein, seinem, seinen, etc. Since English does not possess this way of realization, the combination of genitive with one of the other Case features is realized as -'s[13]. The D of the specifier DP has now got rid of the feature [+GEN] and only possesses the feature [+DEF], which is to be realized as *the*, the unmarked realization of definiteness. As a result, the correct spelled-out form the car's fender obtains. We will call this mechanism of Case feature movement Genitive Raising, which is possessed by a language like English whose system of Case realization is very poor.

Genitive Raising is supported for independent reasons. Groos and van Riemsdijk (1979) discuss cases such as (26) in Classical Greek.

(26) stugón hé (NOM) m'etikten.
hating who to-me gave birth

In (26) the matrix object position, in which a free relative appears, requires the accusative Case whereas the head of the free relative requires a different Case, the nominative Case. Normally a free relative is not allowed to appear in a position like this in languages which require the matching of the matrix Case and the embedded Case. In a language such as Classical Greek, where no matching effect is required, one of the two Cases, the matrix or the embedded Case, is realized. In (26) it is the nominative Case that obtains a realization form. This fact suggests that there should be some Case hierarchy, according to which the actual realization of Case is determind.

Applying this to the Genitive Raising case, we can say that when both

the genitive feature and one of the other Case features are present in the same D as the result of Genitive Raising, the genitive feature always wins over the other, obtaining an overt realization form, -'s. In English a Case hierarchy obtaions not at the level of morphological realization but only at the level of feature representations, for even the genitive Case per se does not have its own realization form but obtains its morphological realization only when it combines with one of the other Case features.

2.2. DP in Japanese

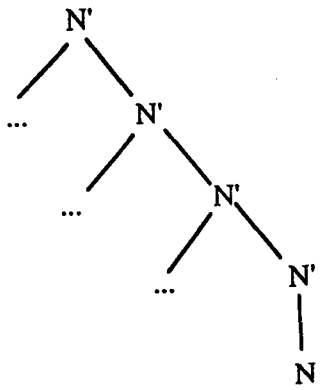
It is generally assumed that articles are lacking in Japanese. Further, there is no evidence that demonstratives are structurally distinguished from adjectives and other prenominal modifiers as illustrated by the following examples.

(27) a. John-no ookina kuruma
John-GEN big car 'John's big car'
b. ookina John-no kuruma

(28) a. ko-no John-no atui hon
this John-GEN thick book
b. atui John-no kono hon
c. John-no kono atui hon

As is clear from these examples, demonstratives occur freely in any prenominal positions and even cooccur with genitives, which is impossible in a language like English. In an attempt to accommodate this fact, Fukui (1986) assumes that a functional category such as D does not exist in Japanese. Consequently nominal projections in Japanese are open and never closed off, as shown in (29).

(29)



Although Fukui's analysis is consistent with basic properties of nominal phrases in Japanese, one important point is missing there: i.e., Case markers are not properly analyzed. In his analysis, like most other recent analyses, Case markers are adjoined to the highest nominal nodes. However, this does not account for syntactic peculiarities of Case markers in Japanese, as we will see shortly.

In the present analysis it is argued that in many significant respects Case markers in Japanese are parallel to articles (and perhaps other determiner elements such as demonstratives) in other languages, and that functional category D does exist in Japanese. There is good reason to argue for such an analysis. First, Case is realized on Case markers in Japanese just as it is realized on articles in a language like German, in which articles carry Case inflections. Compare (30) and (31).

(30) shachoo-no kuruma-o
president-GEN car ACC

(31) das Auto des Presidenten
ACC/NOM car GEN president

Although there are some differences attributable to some language-particular properties, parallelism between (30) and (31) is obvious: i.e., both Case markers and articles are Case-realizers.[14]

Second, both articles and Case markers appear in peripheral positions, though Case markers appear phrase-finally whereas articles appear phrase-initially. In fact, the elements which can appear outside of these positions are quite limited. Compare (32) and (33) with (34) and (35).

(32) a. karera-wa [[shachoo-no kuruma-o]sura] uttesimatta
they-TOP president-GEN car-ACC even sold
b. *karera-wa [[shachoo-no kuruma-o] ookina] uttesimatta
they-TOP president-GEN car-ACC big sold

(33) a. John$_i$-wa [[[$_S$ ___$_i$ motteita] okane-o] subete] Mary-ni ageta
John$_i$-TOP [[[$_S$ ___$_i$ had] money-ACC] all]Mary-DAT gave
b *. John$_i$-wa [[[$_S$ ___$_i$ motteita] okane-o] zibun-no] Mary-ni ageta
John$_i$-TOP [[[$_S$ ___$_i$ had] money-ACC] self-GEN] Mary-DAT gave

(34) a. They sold even the car of the president's.
b.* They sold big the car of the president's.

(35) a. John gave Mary all the money he had.
b.* John gave Mary himself the money he had.

Note that elements which appear to the right of Case markers and those which appear to the left of articles are considered to belong to the same class: i.e., intensifiers and quantifiers, which are thought to occupy the specifier of DP.

The assumption that case markers occupy D will be further supported by examples like the following.

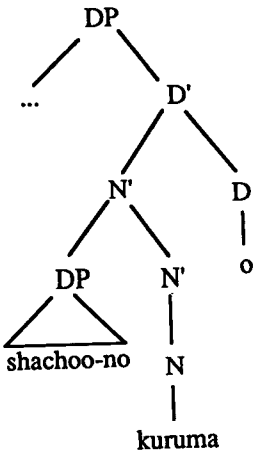
(36) [DP[D'[N'[QP sannin no] gakusei] ga]…]kita
[DP[D'[N'[QP three GEN] student] NOM]…] came 'three students came'

(37) [DP[D'[N' t_i] gakusei] ga] [QP sannin]$_i$] kita

It is assumed that (37) is derived from (36) by Q-floating, which moves a quantifier from a prenominal position to a postnominal position. Though this phenomenon has been noted by many linguists, its structural effects are not clear at all. Note, however, that the floated quantifier in (37) is preceded not only by a head noun but also by the Case marker *ga*. This fact can naturally be accounted for if we assume that the floated quantifier has been moved to the specifier position of DP, a position which c-commands the trace of the floated quantifier; hence the binding condition is not violated. The specifier of DP also functions as a landing site for a movement rule such as Q-floating.

The foregoing discussions lead us to the conclusion that Case markers are heads of DP.[15] Thus, a phrase like *shachoo-no kuruma o*, for instance, should have a structure such as (38).

(38)



Given the analysis presented above, Case markers in Japanese are assigned independent categorial status, the head of DP, whereby not only is the role of Case markers made explicit in the projection schema but also is a way opened to uniformly capture similarities between the Case realization system in Japanese and the corresponding systems in other languages. Thus, structural differences between nominal projections in Japanese and those in a language like German turn out to be minimal. This is one of the most significant implications of the version of DP hypothesis proposed here. The present analysis also accounts for the lack of articles in Japanese, which naturally follows from the fact that in Japanese D is realized as Case markers while it is realized as articles in other languages except for a few minor respects. Moreover, the present analysis predicts that there should be no language in which both articles and Case-marking particles are primary Case realizers. This prediction, however, awaits further empirical support.

3. The nature of Gaps

3.1. Arguments against the PRO analysis

The DP hypothesis discussed above gives a new insight about the internal structures of nominal projections. Among other things, it shows that the N'position is governed since there is no barrier to government between D and the position. Therefore, an N'-gap should be indentified as *pro*. In what follows, we look at some arguments against the PRO analysis in order to ensure the conclusion that the gap is *pro*. First, the licensing of N'-gaps is affected by the content of D. Consider (39) and (40).

(39) * John's talk was interesting, but Bill didn't like the ____

(40) I read John's letter but did not read Bill's ____.

These examples show that an N'-gap is not licensed when D is a definite article. This should not happen if the N'-gap were PRO: i.e., PRO can appear wherever the position is ungoverned.

Second, a nominal head as well as a functional head is inflected according to Case in such languages as German, which have a rich Case inflection system.

(41) Hans schlug den Jungen.
'Hans beat the boy'

Although a Case inflection is weaker on the nominal head than on the functional one, as pointed out before, the presence of a Case inflection on the nominal head itself suggests that there should be a certain goverment relation between D and N.

Finally, the corestriction properties of an N'-gap with an antecedent cannot be derived from control theory of PRO. According to Manzini (1983), a PRO is bound in its domain-govening category which is defined in the following way.

(42) X is a domain-governing category for Y iff
  a. X is the minimal category with a subject containing the c-domain of Y and a governor for the c-domain of Y and
  b. X contains a subject accessible to Y. (Manzini 1983, 433)

Given this definition, let us consider the binding of the N'-gap in the following example.

(43) I compared John's argument with Bill's ____

If the gap is occupied by a PRO, its domain-governing category will be the matrix clause with its c-domain being the DP *Bill's*____. In this case the control theory correctly predicts that the gap is bound by argument in John's argument. However, consider next the sentence in (44).

(44) Mary read John's letter and Susan read Bill's ____.

The control theory in (42) wrongly predicts that Susan is the antecedent of the gap since the domain-governing category of the gap should be the second conjunct Susan read Bill's. The control theory cannot accommodate this fact: hence the gap cannot be PRO but it should be *pro*.

3.2. The *pro*-drop parameter

Given the assumption that the empty N' position is occupied by *pro*, we will have to consider what licenses the occurrence of *pro* in this position. First of all, we will discuss the question of what licenses *pro* in argument positions, and then deal with the licensing conditions within DP.

As has been mentioned in 1.3, the empty pronominal *pro* was originally postulated to accommodate the fact that there are languages such as Italian and Spanish in which subject pronouns normally drop.

In those languages it is considered to be AGR that licenses the occurrence of *pro* for AGR in those languages carries a set of phonetically realized agreement features such as gender, person and number and the content of *pro* is recoverable via those features. However, the role of such agreement features in licensing *pro* is not entirely uncontroversial: while there are languages like Italian and Spanish in which those agreement features are considered to play a crucial role in licensing *pro*, it is also true that languages like Chinese, Korean and Japanese do not have such agreement systems even though empty pronominals are extensively permitted. Further, objects are sometimes null in Italian in which case no agreement feature is available.

Rizzi (1986) claims that the formal licensing part and the interpretation of *pro* must be separated and that agreement features play a role only in the interpretation but not in the formal licensing. He formulates the formal licensing condition of *pro* as follows.

(45) *pro* is Case-marked by X^0_y Rizzi (1986), 519, (40)

This condition states that regardless of agreement features marked on its governor, *pro* is licensed in any argument position except the object position of a passive verb which absorbs Case. The specification of y, a type of governing head, is parametrized so that what counts as X varies from language to language. In English, however, nothing can be a member of the class X^0_y so that no *pro* can be licensed in argument positions.

The recoverability of *pro*, on the other hand, depends on the agreement features phonetically realized on its governor. When no agreement feature is available, as in the case of *pro* in object position in Italian, *pro* is interpreted arbitrarily. The more agreement features are available the more definite interpretation *pro* obtains.

According to Rizzi's formulation, (45), nothing prevents occurrences of *pro* in languages like Japanese, Korean and Chinese.[16] However, condition (45) is too general in a sense since it allows *pro* to occur in almost any argument position and its licensing factor is entirely lexical: i,e., the licensing of *pro* depends exclusively on whether a Case-marking governor of *pro* is a member of the class of licensers.

Arguing against Rizzi (1986), Bouchard (1987) claims that null objects in Italian and French as well as those in English should be unprojected arguments and that the assumption of empty categories in object position itself can thus be eliminated. To account for binding facts such as (46), however,

(46) a. * Good music reconciles ____ with oneself.
b. La buona musica riconcilia ____ con ce stessi.
c. La bonne musique réconcilie ____ avec soi-même.
(Bouchard (1987), (23))

he distinguishes two types of binding, structual binding and thematic binding. Both English on the one hand and Italian and French on the other allow nonprojected objects but the way syntactic binding and thematic binding interact differs between these two classes of languages, thus resulting in the contrast shown in (46), which shows that the syntactic binding of an anaphor by subject overrides thematic binding in English whereas it does not in Italian and French.

In order to restrict the occurrence of *pro* syntactically, Huang (1984) proposes to eliminate object empty pronominals, assuming that those empty objects are variables bound by operators which can be empty. Thus the object *pro* drop parameter is reduced to the presence or absence of such an empty operator position. For instance, a sentence such as (47a) has a representation such as (47b).

(47) a. ___ ___ atta.
pro *pro* met
b. [OP] [*pro* vbl atta]

Thus, the licensing condition of *pro* has only to be formulated so as to permit its occurrence in subject position.

Both Bouchad's and Huang's proposals are attempts to reduce the *pro*-drop parameter and eliminate the occurrence of *pro* in object position. In both analyses, however, there still remains a need for licensing *pro* in subject position, and this is particularly difficult for languages like Japanese, in which no agreement holds between subject and verb. Whether or not object *pro* exists, we will adopt Rizzi's licensing condition as a basis for considering licensing of *pro* in NP-internal positions.

3.3. Licensing of *pro* in N' positions

To investigate the licensing of *pro* in the N' position, we will first characterize the occurrence of *pro* in the following way.[17]

(48) *pro* is licensed in positions;
(i) Case-marked or
(ii) governed by D.

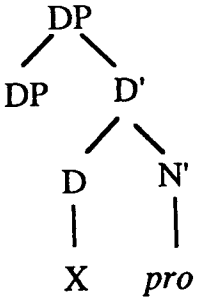
(48i) follows directly from Rizzi's licensing condition and characterizes the distribution of *pro* in argument positions. (48ii), on the other hand, characterizes *pro* in N' positions. In view of the fact that D is also a zero-level category under the DP hypothesis, it seems possible to subsume (48ii) as a subcase under (48i) if the Case-marking property is appropriately defined so as to include the government by D of *pro* in N' positions. In consequence the formal licensing condition in (48), or its slightest modified version, will be able to license *pro* in both argument

and N' positions.

As we noted before, under the DP hypothesis, only the D position is directly Case-marked. Then, Case percolates into the N' position through government by D.

(49) a.

b.

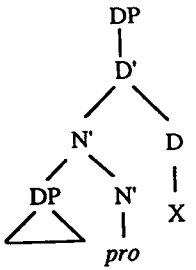


Note that *pro* in both cases are specified for [+N, -V] in addition to the pronominal feature specification [-anaphoric, +pronominal]. They differ only in the feature [±F(unctional)]. Further *pro* in argument positions (henceforth Arg-*pro*) shares [+F] with overt pronominals. In a language like English, Arg-*pro* does not exist simply because nothing can be a licensing head of *pro* in the language, namely $X^0_\gamma = \{\phi\}$.

In a head-final language like Japanese, Arg-*pro* and N'-*pro* occur in configurations such as (50a) and (50b) respectively.

(50) a.

b.



As already known, both types of *pro* can be licensed in Japanese. The justification for the position of a genitive DP which is generated within N' has already been discussed in 2.3. Given the structural representations of two possible contexts for *pro*, an interesting similarity between N'-*pro* and overt pronominals in Japanese can be observed. Consider (51).

(51) a. boku-wa futotta kare-o soozoo-sita
I-TOP fat he -ACC imagine-PAST

b.* boku-wa futotta kare soozoo-sita

Overt pronominals in Japanese are parallel to N'-*pro* but not Arg-*pro* in that they can be preceded by modifiers and are always accompanied by Case markers. In contrast, overt pronominals in English correspond

to Arg-*pro* in their projection property. Compare (52) with (51).

(52) a. I am talking about him.
b.* I am talking about the him.
c.* I am talking about a fat him.

In English pronouns are preceded by neither articles nor adjectives, so the DP status of pronouns is obvious. This differrence in categorial status between English pronominals and Japanese ones may have some relevance to the difference in binding between these two types of languages, but we do not go any further here.

3.4. Further Licensing Factors

Clause (ii) of (48) is a necessary condition but not a sufficient condition, for it does not rule out such examples as the following.

(53)* John bought a red car but Bill didn't buy a (the) *pro*.
(54)* John bought a red car but Bill bought a blue *pro*.
(55)* Mary likes John's blue shirt but not Bill's red *pro*.

(53) demonstrates that an article, definite or indefinite, does not license *pro*. (54) shows that the failure to license *pro* in (55) cannot be made up for even if an adjective is added. In (55) it is shown that the addition of an adjective to a possessive makes the licensing effect void: the sentence would be grammatical without the adjective. These examples are grammatical not for semantic reasons but for purely syntactic reasons. Note that the German example corresponding to (56) is completely grammatical.

(56) Peter kaufte ein rotes Auto, aber Hans kaufte ein blaues *pro*.
Peter bought a red car, but Hans bought a blue *pro*.

And also the examples in (53)-(55) will become grammatical if the occurrences of *pro* are replaced by pronominal *one*. Therefore it should be concluded that the ungrammaticality in these examples follows solely from the absence of licensing effects. Now, in addition to the licensing condition in (48), let us further characterize the environments in which N'-*pro* can occur.

(57) (i) The realization of D must be morphologically distinctive.
(ii) An adjective which immediately precedes N'-*pro* must be inflected.

Sentence (53) is ungrammatical because the D position is unmarkedly realized, *the* or *a* : i.e., (57i) is not satisfied. In (54) the N'-*pro* is preceded by a bare adjective which does not meet (57ii): in English an adjective dose not inflect so that no *pro* is licensed in the position immediately preceded by an adjective. The corresponding German example (56) is grammatical because the adjective carries a Case inflection, *-es*, which satisfies (57ii).

Though (57) correctly characterizes the environments necessary for the occurrence of N'-*pro*, it is too specific to be a universal condition and also there is considerable redundancy: among other things, both (i) and (ii) rely on some morphological properties of the preceding elements. If we manage to eliminate redundancy, then it is possible to formulate, on the basis of (57), a more general licensing condition which, together with the licensing scheme (48), is expected to constitute a sufficient condition for N'-*pro*. But before doing so, we will take a look at Japanese cases which the conditions in (48) fail to handle.

Consider (58) and (59).

(58)* [[John-no titioya]ga][[*pro*] o]kiratte iru
[[John-GEN father]NOM][[*pro*] ACC]hate-PRES

(59)* John-wa[[kiiroi kuruma]o]katta ga Bill-wa[[akai *pro*]o]katta
John-TOP [[yellow car]ACC]bought but Bill-TOP [[red *pro*]

The ungrammaticality in(58), where the Case marker is the only phonetically realized element within the DP containing N'-*pro*, demonstrates that a certain modifier must precede N'-*pro*. (59), on the other hand, shows that an adjective with a normal adjective ending does not license *pro*: the adjective must end with *-no* as in (60).

(60) John-wa [[kiiroi kuruma]o]katta ga Bill-wa [[akai-no *pro*]o]
katta

Normally adjectives in Japanese end in *-i* as in kiiroi in (60), but whenever they precede N'-*pro*, they must be of the form with *-no*, which is of the same form as the genitive suffix. The same suffix must also be present when relative clauses precedes N'-*pro*.

(61) a. [NP [S ____ kinoo tabeta]sakana]-yori [NP [S____kyoo tabeta]
no *pro*]-ga oisikatta [NP [S____yesterday eat-PAST]fish]-
THAN [NP[S__today eat-PAST]-GEN *pro*]-NOM better-taste-
PAST
'The fish eaten today tasted better than the one eaten
yesterday'
b.* [NP [S____kinoo tabeta]sakana]-yori [NP[S____kyoo tabeta]
pro]-ga oisikatta

As (61b) shows, a relative clause without *-no* is not allowed when it precedes N'-*pro*. Thus, it can be said that *-no* is generally required in the position immediately preceding N'-*pro*, regardless of which category occupies that position.

Considering the relations between the occurrence of N'-*pro* and its

environments in cases (58)-(61), it seems natural to assume that (57) is responsible also for such cases. The ungrammaticality in (59) and (61b) is due to a violationof (57b), and (58) is ungrammatical because (57a) has not been met. In what follows we will refine the idea presented in (57b) using the distinction between strong and weak forms.

3.5. Strong Form vs. Weak form

To account for the alternation of forms of possessive pronouns in English, Siegel (1974) proposes to distinguish between strong and weak forms of pronouns. Thus, a pronoun of the form as given in (62) is referred to as a weak form whereas a pronoun of the form as given in (63) as a strong form.

(62) my suitcase
(63) mine *pro*

She also notes that the occurrence of an empty category on the use of a strong form: i.e., an empty category always occurs with a strong form of possessive pronoun. If we adopt this distinction, the facts noted above concerning N'-*pro* will be given a coherent explanation.

Suppose that the notion *strong form* is extented to cover not only a form of possessive pronoun, such as the one in (58), but also adjective inflections and other suffixes which cooccur with an empty category. Then, the characterization of the environments in which N'-*pro* can occur because much simpler and more general. Let us revise (57) as (64).

(64) N'-*pro* must be adjacent to a strong form.

Thought it needs to be further modified and refined, (64) only mentions the form of an adjacent element without referring to categorial

distinctions. In this respect (64) has advantage over (57). This also explains why *-no* is required in pre-gap positions; *-no* is also assumed to be a strong form. (58) is ruled out for the same reason as (53) is. A Case marker as well as the definite or indefinite article does not count as a strong form, for a single Case feature in Japanese or an unmarked realization of definiteness is not strong enough to be a licenser. A genitive feature or a plural feature in combination with the definiteness feature counts as a strong form since it has its own realization form. Though the distinction between strong and weak forms must be stated in more abstract terms, we will pursue the elaboration of this notion in future study.

3.6. Other ellipsis cases

The discussions we have so far made have signficant consequences on other ellipsis phenomena. Among others, the notion of functional heads and their role in licensing of null elements may directly be applied to cases such as VP ellipsis. As has been pointed out by Van Riemsdijk (1987c) the relation of D to N parallels that of I to V in that they have the same feature specifications except for the feature [±F]. If this is correct, VP ellipsis can be captured in terms of V' ellipsis which is possibly licensed by I just as N'-*pro* is licensed by D. In fact, V' gaps is extensively allowed in a language like English, in which it is assumed that V raises into I to get necessary agreement features. On the other hand, that phenomenon is lacking or has quite restricted distribution in a language in which V does not raise into I at all and in a language in which V-Second which raises V up to C applies.

This move clearly has a great advantage over a theory which resorts to a notion like the specifier government, since in the present approach any special government relation other than the usual government by the head need not be stipulated to license an empty category, and also

the relation between N' ellipsis and V' ellipsis will be captured in a consistent way.[18] I do not pursue this issue any further and leave it for further research.

4. Binding properties

4.1. Principles of the Binding Theory

Now that an N'-gap is identified as an instance of *pro*, the interpretation of *pro* is expected to obey Principle B of the binding theory. The DP hypothesis discussed above claims that N'-*pro* is governed by D. Therefore the governing category for N'-*pro* is its immediate DP. Then it follows from Principle B that *pro* must not be bound by its antecedent within the matrix DP. This explains why *pro* is corestricted with an antecedent in examples like (1) above, repeated here as (66).

(66) John's father hates $[_{DP}\ [_{DP}\ [_{N'}$Bill$]$'s$][_{N'}$*pro*$]]$

Since it has only to be free in the matrix DP, *pro* is allowed to seek its antecedent N' anywhere outside this DP. This is also the case in Japanese.

(67) $[_{DP}\ [_{NP}$ John-no kuruma$]$ga$][_{DP}\ [_{NP}$ Bill-no *pro*$]$ni$]$ butukatta.
[John-GEN car]-NOM[Bill-GEN *pro*]-DAT hit-PAST'John's car hit Bill's'

In (67) *pro* and its antecedent *kuruma* are corestricted for the same reason as *pro* and *father* are in (66).

Consider next the disjoint reference in (68), which seems problematic for our analysis.

(68) John-no hanasi-to Bill-no ____ -to ga omosirokatta
John-GEN talk-CONJ Bill-GEN ____ -CONJ NOM interesting-PAST
'John's talk and Bill's were interesting'

If we assume that each conjunct in (68) has a structure like (69), the disjoint reading is quite unexpected.

(69) $[_{DP}\ [_{NP}$ Bill-no *pro*$]$to$]$

Our assumption says that *pro* must be free within matrix DP, so that the gap in (67) could find an antecedent outside DP. (68) would remain problematic if we maintained the structure in (69). But suppose a proper analysis of the conjointed structure in (68) is not (69) but (70) below.

(70) $[_{DP}[_{D'}[_{D'}[_{N'}[_{DP}$ John-no$]$hanasi$]$to$][_{D'}[_{N'}[_{DP}$ Bill-no$]$*pro*$]$to$]$ ga$]$...$]$

The disjoint reference in (68) is quite predictable because each conjunct is not DP but D' with *to* being its head and *pro* must not be bound within the DP containing both conjuncts. Further we predict that if both conjuncts in (70) contain *pro*, each occurence of *pro* can be corestricted with an antecedent outside of the DP dominating it. This prediction is borne out: in (70) both occurrences of *pro* are interpreted as *hanasi*, which has been mentioned in the preceding discourse.

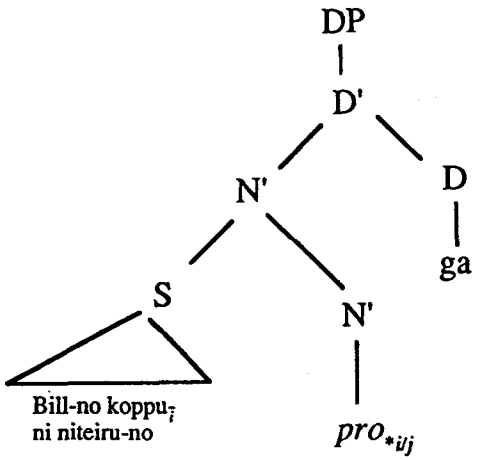
(71) A: dono hanasi-ga omosirokatta no
which talk-NOM interesting-PAST Q
B: John-no *pro* to Bill-no *pro* to ga omosirokatta
John-GEN *pro* AND Bill-GEN *pro* AND NOM intersting-PAST.

A similar type of disjoint reading results when a possible antecedent of *pro* appears in the clause embedded within the same DP.

(72) [DP[S Bill-no koppu-ni niteiru]-no *pro*]ga] nakunatta
[DP[S Bill-GEN cup-DAT resemble]*pro*]NOM] disappear-PAST

In this example *pro* does not denote or is coindexed with *koppu* but something else. In other words *pro* is not coindexed with *koppu* in the relative clause. The tree configuration of the DP in (72) will be (73).

(73)



Note that *pro* is not c-commanded by *koppu*. Rather *pro* c-commands its antecedent *koppu* in (72), which leads to a violation of Principle C. Thus the disjoint reference in (72) conforms to the Binding conditions.

It is worth discussing here again similarities between N'-*pro* and overt pronouns in Japanese. If overt pronouns in Japanese are similar to N'-*pro*, the same binding principles apply in both cases. Consider (64) and (75).

(74) John$_i$-ga wakaikoro-no kare$_i$-o yoku omoidasu (koto).
John-NOM his youth-DAT he-ACC often recall

(75)* Johni-ga karei-o omoidasu (koto).

When modified by an adjective as in (74), a pronoun such as *kare* can be bound within the same clause, but the same pronoun must be free in the matrix clause if it is not preceded by anything. Assuming that an overt pronoun in Japanese represents N', the grammaticality of (74) follows from the binding theory. That is, the governing category of *kare* in (74) is the matrix DP. However, the ungrammaticality of (75) seems problematic. If the governing category is DP, then why can *kare* in (75) not be bound in the same way? To account for the contrast between (74) and (75), it is necessary to refer to the presence or absence of subject within a DP. Suppose that the modifying *-no* phrase in (74) functions as the subject of the DP in determining the governing category. We will adopt the version of the definition of a governing category as proposed in Chomsky (1981), which is stated as follows.

(76) β is a governing category for α iff β is the minimal category containing α, a governor of α, and a SUBJECT accessible to α. (Chomsky 1981, 211)

Thus, it can be said that the governing category of kare in (74) is the DP *wakaikoro-no kare* because the DP contains the subject *wakaikoro-no*, whereas the governing category of kare in (75) is the whole sentence because DP does not have any subject. This discussion about the definition of a governing category can also apply for cases in English. Assuming that a possessive DP or a quantifier phrase qualifies as subject of a DP, a governing category can be defined in terms of (76) in English as well.

In what follows we will examine the interpretation of N'-*pro* in

conjunction with the constructions in which N'-*pro* can be assigned bound readings different from corestriction as we discussed above. We will see that the interpretation of N'-*pro* even those cases is quite predictable from the structural properties of DP and the binding principle B.

4.2. Some empirical consequences

4.2.1. Topic constructions

In topic constructions the N'-*pro* appears in the source position and may or may not be bound by the topic phrase. Consider the following examples.

(77) hanasi-wa [John-ga [$_{DP}$ [omosiroi-no *pro*]o]konomu]
talk-TOP [John-NOM [interesting-GEN *pro*]-ACC like]
'as for talks John likes an intersting one'

(78) natu-ni-wa [John-ga [$_{DP}$ [atui-no *pro*]o]konomu]
summer-DAT (POSTPOSITION)-TOP [John-NOM [DP [hot-GEN *pro*]ACC] like-PAST]
'in summer John likes a hot one'

(79) natu-wa [John-ga [$_{DP}$ [atui-no *pro*]o]konomu]
summer-TOP [John-NOM [hot-GEN *pro*]-ACC like]
'as for summer John likes a hot one'

In (77) N'-*pro* is bound by its antecedent. In (78), however, it is not bound but assigned arbitrary interpretation. In (79) both bound and arbitrary readings are possible; i.e. the sentence can be interpreted as either *John likes a hot summer* or *John likes something hot*.

Our theory of *pro* discussed in the previous section predicts that N'-*pro* in the source position can either find its antecedent outside the DP in which it occurs or be arbitrary in reference. Therefore the referentail

property in (79) is predictable from the binding principle B. However, the readings in (77) and (78) does not seem to follow from the binding thoery. Why does N'-*pro* have a bound interpretation in (77) and an arbitrary interpretation in (78)?

What distinguishes them seems to be a difference in the manner of linking a topic phrase to its original D-structure position. In (77) the topic phrase cannot be taken to be linked to an adjunct position; it must be related to some argument position in the clause. In (76) the topic phrase must be linked to an adjunced position since the topic marker -wa is preceded by the dative or adjunct marker -ni[19]. Compare (76) with (80) and (81).

(80) natu-ni-wa [John-ga oyogi-o konomu]
summer-P-TOP [John-NOM swimming-ACC like]
'In summer John likes swimming'

(81)* natu-ni-wa [John-ga konomu]
summer-P-TOP[John-NOM like]

In (79) the topic phrase can be related to either an argument position or an adjunct position as (82) and (83) show.

(82) natu-wa [kitobito-ga oyogu]
summer-TOP [people-NOM swim]
'In summer poeple swim'

(83) natu-wa [boku-ga sukida]
summer-TOP [I-NOM like]
'Summer, I like'

The distinction in the manner of linking crucially reflects the difference in interpretation as illustrated in (77)-(79). We can characterize the binding properties of the N'-*pro* in topic constructions in the following informal way:

(84) An N'-*pro* is bound by an argument topic phrase[20]; otherwise it is assigned arbitrary interpretation.

This characterization does not follow directly from the property of N'-*pro* but rather from its interactions with the structual property of topic constructions. If following Saito (1985), we assume that the PP topicalization is movement whereas the NP topicalization is base-generated, (84) will be replaced by another explanation. According to this assumption, (78) above is derived by movement since natu-ni is a PP. Then this topic phrase, which is in an A'-position, must bind a variable created by movement. If the N'-*pro* is coindexed with the topic, the varicle and hence with the topic, the sentence would be a violation of the Bijection Principle.[21] Thus the N'-*pro* must be arbitrary in reference. This proves that an N'-*pro* can be a semantic variable; hence it is a pronominal. In (77) the topic phrase is bese-generated and the N'-*pro* behaved as a resumptive pronoun so that the N'-*pro* can be bound by the topic phrase as expected. This also proves that an N'-*pro* is a pronominal. In (79) both the topic can be either movement or base-generated depending upon whether it is interpreted as an argument or an adjunct. Apart from the problem concerning whether -ni is really a postposition, all these cases are given a uniform explanation if we assume N'-*pro* in gap positions and the distinction noted by Saito, namely the distinction between the PP topicalization and the NP topicalization; the former is movement and the latter base-generated.

Now let us consider the topic constructions in which N'-gaps are embedded in complex NPs.

(85) hanasi-wa[$_S$ boku-ga [$_{DP}$ [$_S$ e_i [DP [John-no *pro*]o]kiita] hito$_i$] ni] atta
talk-TOP [$_S$I-NOM [$_{DP}$ [$_S$ [$_{DP}$ [John-GEN *pro*]ACC] hear-PAST] person]DAT]met]
'As for the talk, I met a person who heard John's'

(86) natu-wa [$_S$ boku-ga [$_{DP}$ ___ i [$_{DP}$ [atui-no *pro*]o]konomu]hito$_i$] ni] atta]
summer-TOP [$_S$ I-NOM [$_{DP}$ ___ i [$_{DP}$ [hot-GEN *pro*] ACC] like] person$_i$] DAT] met]
'As for summer I met a person who liked a hot one'

(87)* natuj-ni-wa [$_S$ boku-ga [$_{DP}$ ___ i tj [$_{DP}$ [atui-no *pro*]o]konomu] hito$_i$] ni] atta]
summer-DAT-TOP [$_S$ I-NOM [$_{DP}$ ___ i [$_{DP}$ [hot-GEN *pro*] ACC] like] person$_i$] DAT] met]
'In summer I met a person who liked a hot one'

Note that (87) is ungrammatical with the intended reading. This result is consistent with the assumption that the PP topicalization is movement, since the movement of natu-ni from the tj position violates subjacency. (86) is acceptable but only with the reading in which the N'-*pro* is bound by the topic phrase; i.e. the reading involving movement is ruled out and only the resumptive pronoun interpretation of the N'-*pro* is accepted. (85) does not differ from (77) in grammaticality, for no movement is involved in (85) and hence no subjacency violation expected.

4.2.2. Relative clauses

In relative clauses the N'-*pro* can be assigned a bound reading just as in the case of topic constructions. Consider the examples in (88) and (89).

(88) [$_{DP}$ [$_S$ John-ga [$_{DP}$ ookii-no *pro*]-o katta]kuruma][$_{DP}$[$_S$ John-NOM[$_{DP}$ big-GEN *pro*]-ACC buy-PAST] car]

(89) [$_{DP}$ [$_S$ John-ga [$_{DP}$ atui-no *pro*]-o konomu] natu]
[$_{DP}$ [$_S$ John-NOM [$_{DP}$ hot-GEN *pro*]-ACC like] summer]

The readings of *pro* in (88) and (89) correspond to those in (77) and (79) in

topic constructions respectively; i.e., in (88) *pro* is bound by the relative head kuruma and arbitrary interpretation is excluded, whereas in (89) both bound interpretation and arbitrary interpretation are possible. There is no case in relative clause constructions which corresponds to (87) in topic constructions, since the relative head cannot be a PP.

The possibility of arbitrary interpretation in (89) is surprising because it does not seem conceivable that a relative head binds a non-argument position, in which case the result is ungrammatical in English.

(90)* $[_{DP}$ the summer$_i$ $[_{CP}$ $[_{IP}$ people go swimming ___i$]]]$

However, the corresponding relative clause in Japanese is perfectly grammatical with the reading in which the relative head binds an adjunct position.

(91) $[_{DP}$ $[_{IP}$ hitobito-ga ___i oyogi-ni yuku$]$natu$_i]$
$[_{DP}$ $[_{IP}$ people-NOM swimming-P go$]$ summer$]$

Given the fact as illustrated in (91), the ambiguity of N'-*pro* in (89) is quite expectable; they parallel those in (79) in topic constructions.

From these facts it is clear that the N'-*pro* in relative clauses behaves as a pronominal which obeys principle B of the binding theory. It can either be bound by a relative head or be assigned arbitrary interpretation; the latter results only when a relative head can bind a non-argument position. Since N'-*pro* must not be bound within the governing category, the DP containing it, both bound and arbitrary interpretation is possible depending on each context. Note that the use of a resumptive pronoun in place of the DP containing N'-*pro* cases like (92) is also possible though the grammaticality somewhat degrades.

(92)? [John-ga sore-o katta] kuruma

This follows naturally from the assumption that relativization in Japanese does not involve any movement, which in turn proves that N'-*pro* in relative clauses has the property of a pronominal element.

5. Conclusion

We have seen that gaps taking place within nominal projections are instances of a base-generated empty category in N' positions. As for the nature of this empty category, there are three possibilities; PRO, *pro* and a trace. Although it is not likely to be a trace for obvious reasons, the other two possibilities need to be discussed. On the basis of evidence that the gap position should be governed, we have found that the gap position is occupied by an empty pronominal *pro*.

The licensing condition for N'-*pro* has been discussed in relation to the *pro*-drop parameter, and a few analyses have been considered. Following Rizzi's licensing schema, we have discovered that whenever N'-*pro* occurs, it is adjacent to a strong form, whose notion has been incorporated from Siegel.

In the last section, it has been shown thet N'-*pro* is subject to condition B of the binding theory, and this result in turn supports our analysis that the gap position is occupied by a pronominal element, *pro*.

As a matter of fact, our analysis has a number of problems. First of all, notions such as strong and weak forms are to refined and stated in more abstract terms, so that the licensing condition of N'-*pro* will become more straightforward. Further, it will be necessary to explore the nature of *no* in more datail, which occurs not only in pre-gap positions but also in other positions such as clause-final positions of a

certain class of embedded sentences. To my knowledge, however, the categorial status of *no* has not been identified in any convincing ways in the literature. These questions will be scrutinized in subsequent research.

Notes

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1 For more discussions, see Jackendoff (1971) and Neijt (1979), among others.

2 See Lobec (1986).

3 It has often been assumed in the literature that *-no* itself is pronominal. Consider the following examples.

(i) a. Mary-wa [John-no tegami]-o yonda-ga [Bill-no tegami]-o yonde-inai
b. Mary-wa [John-no tegami]-o yonda-ga [Bill-no sore]-o yonde-inai
c. * Mary-wa [John-no tegami]-o yonda-ga [Bill sore]-o yonde-inai

In Japanese, a pronoun can be preceded by a genitive NP or an adjective, but the genitive marker *-no* cannot be omitted. If *-no* is pronominal, it could be preceded by another -no whenever modified by a genitive NP. However, as (ii) shows,

(ii)* Mary-wa[John-no tegami]-o yonda-ga [Bill-no no]-o yonde-inai

-no preceded by another *-no* is ruled out. For the claim that *-no* is pronomal, see Inoue (1977) and Okutsu (1965), among others. On the other hand, Bedell (1972) claims that gaps are present in these examples, though he argues that the gaps result from a deletion operation.

[4]The presence of Case markers in the post -gap positions in Japanese might be viewed as a difference between gap constructions in English and Japanese. However, Case markers are generally required of noun phrases in Japanese, so the difference just noted has nothing to do with the occurence of gaps as we see from the following examples.

(i)* [NP John-no ie]-ga [NP Bill-no ___] tikai (koto)
[NP John-GEN house]-NOM[NP Bill-GEN ___] close
'John's house is close to Bill's'

(ii)* [NP John-no ie]-ga[NP Bill-no ie] tikai (koto)

[5]According to Chomsky (1982) pro is specified for [+pronominal, -anaphoric], hence it is the empty counterpart of an overt pronominal.

[6]Olsen's idea that *pro* occurs in the head position is incorrect for reasons that we have already discussed.

[7]In fact, Lobeck (1986) proposes the notion 'specifier government' to accommodate the licensing effect in various gap constructions including N'gaps.

[8]The standard analysis of NP stands for the analysis based on the phrase structures in which each lexical category projects to its own maximal projection. More specifically it refers to analyses by Jackendoff (1977) and Chomsky (1981).

[9]The original idea was presented in Brame (1982). This idea is formulated in the GB framework in Abney (1985, 1986). See also Fukui (1986) and Haider (1987).

[10]For similar ideas, see Haider (1987).

[11]See Chomsky (1986) for the discussion that only maximal projections can be barriers.

[12]Nominative, objective and oblique Cases are assigned in a normal way under government by [-N] heads. Cf. Stowell (1981).

[13]In German, in contrast, no feature movement takes place other than in the case of pronouns. A genitive phrase does not normally appear in the specifier of DP but appears as a complement of N, where the DP is not in the domain of Case-assignment but genitive is assigned as a default Case just as in the case of English. A genitive DP, however, has its own realization form in this language, as is shown by a genitive phrase like des Manners, etc.

[14]What should be attributed specifically to Japanese grammar includes the lack of plurality and perhaps of definiteness on Case markers. This follows from the fact that plurality and definiteness are marked options in Japanese.

[15]Tonoike (1988) also proposes DP for Japanese. His analysis, however, differs from what we have been proposing here in some crucial respects.

[16]The following examples show the distribution of *pro* in Japanese: *pro* can occur not only in subject position but also in object position.

(i) *pro* kinoo kare-ni atta (koto)
pro yerterday him-DAT meet-PAST

(ii) watasi-ga kinoo *pro* atta (koto)
pronoun (1st person singular)-NOM yesterday *pro* meet-PAST

In cases like these *pro* is complectely licensed and given appropriate contexts it is fully interpretable, though gender, person and number features

are not recoverable. Thus, the requirement that agreement features be persent in AGR does not seem universal but valid only for a class of languages, in which those features are relevant for detemining pronominal reference.

To compensate for the lack of agreement features such as those found in Italian or Spanish, however, Japanese possesses a different agreement system, a system of honorifics. In Japanese , like Korean and Chinese, the honorific system, which is characterized by honorific affixes attached to verbs, is considered part of the grammatical system (see Harada (1976) for a detailed description of honorifics in Japanese). To illustate the honorifics in Japanese, take a look at (iii) and (iv), in which the italicixed elements represent honorific affixes.

(iii) Chomsky-kyoozyu ga watasi-ni gengogaku-ni-tuite *o*-hanasi-*ni*-*nat*-ta
Chomsky-professior-NOM me-DAT linguistics-ABOUT talked
'professor Chomsky talked to me about linguistics'

(iv) watasi-ga Chomsky-kyoozyu-ni gengogaku-ni-tuite*o*-hanasi-*si*-ta.

(iii) is an example of subject honorifics, in which honorific affixes agree with the subject NP, and (iv) an example of object honorifics, in which honorific affixes agree with the object NP. These honorific affixes make honorified the NPs with which they agree.

The NPs which trigger honorifics need not be phonetically realized: they can be empty. So the *pro*'s in (v) and (vi) can be honorified just as the overt NPs in (44) and (45) can be.

(v) *pro* kinoo kare-ni *o*-ai-*ni*-*na*-tta (koto)
pro yesterday him-DAT meet-PAST

(vi) watasi-ga kinoo *pro* *o*-ai-*si*-ta (koto)
pronoun(1st person singular)-NOM yesterday *pro* meet-PAST

In cases like (v) and (vi), where honorific affixes are attached to verbs, the interpretation of *pro* becomes different from that in (iii) and (iv): it is no longer arbitrary but the *pro* refers to someone understood in the discourse. The contract is sharper in the following pair of examples.

(vii) a. [$_S$*pro* eigo-o hanasu]-koto-wa muzukasii
[$_S$*pro* English-ACC speak]-THAT-TOP difficult
'to speak English is difficult'

b. [$_S$*pro* eigo-o *o*-hanasi-*ni*-*na*-ru]-koto-wa muzukasii
[$_S$*pro* English-ACC speak]-THAT-TOP difficult
'to speak English is difficult.'

(viia) is a context in which empty subject is typically assigned arbitrary refernce. However, in (viib), which would be the same as (vi) except for honorific affixes marked on the verb, no such interpretation is possible. The subject of the embedded clause is interpreted to be someone who has already been mentioned in the previous discourse. This property seems parallel to the interpretive property of *pro* in languages like Italian and Spanish. Thus, we can say that the system of honorifics in Japanese is comparable to the agreement systems in other well-known *pro*-drop languages.

[17]One may argue that the condition (34) is a subcase of a condition like Bennis's (1986) *Gap Condition*, an extension of Kayne's (1984) g-projection. However, while the Gap Condition is a condition which relates a gap created by movement to its antecedent in terms of government and a well-formed set of projection lines, condition (43) a condition on the occurrence of a base-generated empty category, *pro*, does not claim anything about a well-formedness relation between a gap and its antecedent. Thus it will not be possible to treat condition (43) as a subcase of a condition like the Gap Condition.

[18]See Lobeck (1986) for arguments in favor of specifier government.

[19]-ni can be used both as a dative Case marker and as a adjunct marker. Unlike other Case markers, it is preserved when the phrase it is attched to is topicalized. Consider the contrast between the (a) and (b) sentences in the following examples:

(i) a. hon-o boku-ga Mary-ni ageta (koto)
book-ACC I-NOM Mary-DAT give-PAST
b. hon-wa boku-ga Mary-ni ageta
book-TOP I-NOM Mary-DAT give-PAST

(ii) a. Mary-ni boku-ga hon-o ageta (koto)
Mary-DAT I-NOM book-ACC give-PAST
b. Mary-ni-wa boku-ga hon-o ageta
Mary-DAT-TOP I-NOM book-ACC give-PAST

The fact given here gives rise to an assumption that -ni is not a Case marker but a postposition. This assumption is proposed by Saito and supported by many, but problematic for the DP hypothesis for obvious reasons. Whether or not -ni is a postposition, we have to accept at least the fact that -ni is different from -ga or -o if many ways.

[20]By argument topic phrase I mean a topic NP related to the position which has been assigned an argument A-role.

[21]See koopman and Sportiche (1982/1983).

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