

RETROACTIVE NOMINALS: A VIEW FROM THE REVISED DP HYPOTHESIS*

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0. Introduction.

This paper discusses the syntactic nature of what Clark (1985) calls "retroactive nominals" (henceforth, RNs), exemplified by the bracketed parts of (1):¹

- (1) a. John could use [a good talking to (by a competent psychiatrist)]
- b. These ideas merit [some working on (by Bill)]
- c. This problem bears [some thinking about (by everybody in the class)]
- d. My room needs [a thorough picking up (by the janitor)]

RNs are noun phrases since they can contain determiners, adjectives or other elements that typically appear in noun phrases. A lot of traditional grammarians considered RNs to be marked or peripheral for their semantic uniqueness: the understood object of the verb or preposition in them refers back to the matrix subject, hence retroactive.

However, I would like to treat RNs within core grammar for the following reasons: (i) there is a syntactic gap in each of them, (ii) the gap is always understood to refer to the matrix subject, as just mentioned, (iii) preposition stranding is allowed, as seen in (1), and (iv) they have further interesting properties unnoticed in the literature, as will be seen in sections 1 and 3. It seems that all of them are phenomena that are commonly found in core grammar and that require a principled explanation.

In one sense this paper is a syntactic analysis of RNs. In another sense it explores consequences of the "revised DP hypothesis" presented by Takano (1988a, b, to appear), upon this topic. Throughout the discussion I will assume the

general framework of the Government-Binding or Principles-and-Parameters theory initiated by Chomsky (1981).

1. Syntactic Properties of RNs.

One might wonder whether a gap is syntactically present in RNs. Suppose that a gap is not present. Then a possible account for the unique interpretation would be to treat RNs parallel to "middle" or "unaccusative" constructions. This is not tenable, however, since the agentive *by*-phrase is permitted to occur in the former, as in (1), but not in the latter, as in (2):

- (2) a. *This book sells well by John
 b. *The door opened by John

Thus the claim that RNs are associated with middle or unaccusative constructions cannot be maintained.

Recall that RNs allow preposition stranding. It seems that this fact is reminiscent of movement: it might be taken to show that some movement is involved in RNs. So let us pursue this possibility of deriving RNs through movement. Then our next task is to find out what kind of movement is involved. Clark (1985) cites the following properties of RNs, which have been unnoticed in traditional work. First, a pleonastic element cannot occupy the matrix subject position, as in (3):

- (3) a. *It bears [some thinking about this problem]
 b. *It needs [a thorough picking up of my room]

This suggests that the matrix subject position is a θ -position, and it also eliminates a possibility of "object-to-subject raising".

Second, RNs exhibit Specified Subject Condition (SSC) effects:

- (4) a. *This problem_i bears [everybody's thinking about
e_i]
b. *My room_i needs [the janitor's picking up e_i]

It is not for semantic reasons that the sentences in (4) are bad, since Agent can appear in RNs in the form of *by*-phrase, as shown in (1). This suggests that the empty category in RNs is anaphoric.

Third, the empty category in question does not license a parasitic gap:

- (5) a. This problem_i deserves [some thinking about e_i
without losing any sleep over {*e_i/it_i}]
b. This novel_i merits [some rewriting e_i without
changing {*e_i/it_i} too much]

Again, semantic interpretation is not responsible for the unacceptability of the above examples, since they become perfect when an overt pronoun is used in place of a parasitic gap. It is well known that variables, but not NP-traces, can license a parasitic gap (see Engdahl (1983)). Then this case implies that the empty category is not a variable.

Finally, RNs resist embedding; that is, the gap cannot be embedded in, say, an additional clause:

- (6) a. *My office_i needs [some convincing (of) the
janitor [to clean e_i up]]
b. *This book_i deserves [some persuading (of) the
students [to discuss e_i over beer]]

This excludes a possibility that the empty category is a variable left by an operator of some sort or an empty pronominal *pro*, since the relation between these elements and their antecedents is unbounded, as has been argued in the literature. As for cases where the gap is embedded in an additional noun phrase, I will examine their nature in section 5 below.

Notice that the second, third and fourth properties above contrast sharply with the properties of *tough* constructions, degree clauses, and so on, which arguably involve Wh-movement of an empty operator; that is, such constructions do not exhibit SSC effects, license parasitic gaps and permit embedding, as has often been noted in the literature. These considerations naturally lead us to consider that PRO moves leaving an NP-trace within RNs, a conclusion arrived at by Clark. Thus, in Clark's terms, the relevant S-structure representation of, say, (1a) is as follows:

(7) John_i could use [NP PRO_i a good talking to t_i]

Movement of PRO is necessary because of the PRO theorem, which, being derived from Binding conditions (A) and (B), requires that PRO be in an ungoverned position at a level relevant to Binding Theory.² A few words concerning SSC effects found in (4) are in order. Clark argues that RNs like (4) have their SPEC occupied by the prenominal subject and that hence there is no landing site for PRO, an impermissible situation. Thus examples like (4) in fact do not violate condition (A) of Binding Theory, but the PRO theorem, according to his argument.

It seems that the claim that RNs involve movement of PRO is not untenable, since that movement is considered to be within the range of the general "Move α " and is already found in clauses, as in (8):

- (8) a. John_i tried [PRO_i to be examined t_i by the doctor]
 b. John_i wants [PRO_i to seem t_i happy]

Notice also that the claim might capture the fact in (9):

- (9) a. *John_i needs [PRO_i giving of the book to t_i]

- b. *John_i wants [PRO_i to be given (of) the book to
t_i]

There are several points that are left unexplained in Clark's analysis, however. To give two of them here, among others, one is about the landing site of PRO. As Clark himself admits, it is unclear where PRO is permitted to move in (7), despite the presence of a determiner *a*, which is most naturally considered to occupy the same place as the prenominal subject in (4) under the NP analysis of noun phrases, which has been widely assumed until recently. The other is about the mechanism that ensures the obligatorily controlled interpretation of PRO in RNs. Clark's analysis has little to say about this, either. In what follows I will explore a possibility of explaining these points together with others.

2. The Revised DP Hypothesis.

In Takano (1988a, b, to appear), essentially following Tonoike's (1988) idea, I have introduced a new internal structure of noun phrases that has the projection of INFL in it, as shown in (10):³

- (10) [_{DP} D [_{IP} the enemy's I [_{NP} destruction of the
city]]]

Thus noun phrases are considered to be categorially DP consisting of three maximal projections DP, IP and NP, the "revised DP hypothesis" as I shall call it. For detailed discussion on the motivation for this hypothesis and on some of its consequences, see the references cited above.

Now let us consider (11), which was pointed out by Williams (1985):

- (11) yesterday's destruction of the city to prove a
point

If Roeper's (1983) claim that the rationale clause is licensed by a syntactically projected Agent is correct, (11) poses a problem to (10), since (10), as it stands, ensures no room for Agent PRO in the case of (11). So let us assume that external θ -marking takes place within NP in the case of N. Then it follows that the correct S-structure representations of (10) and (11) are (12) and (13), respectively:

(12) [_{DP} [_{IP} the enemy_i's I [_{NP} t_i destruction of the city]]]

(13) [_{DP} [_{IP} yesterday's I [_{NP} PRO_i destruction of the city [_{PRO_i} to prove a point]]]]]

Thus Agent DP, generated within NP at D-structure, moves to the SPEC of IP to receive Case at S-structure, as in (12), whereas Agent PRO, which arguably needs no Case, may stay in place, as in (13).

Note that it must be ensured that PRO in (13) is not governed. Let us assume that lexical government (i.e. government by a lexical category) relevant to Binding Theory is directional: in the left-to-right direction in English. Notice that PRO is still not allowed to occur as a subject of the tensed IP, since INFL, not a lexical category, governs in both directions.

It seems that the assertion that a head externally θ -marks within its maximal projection does not hold for V. Consider the following:

(14) *Yesterday destroyed the city (to prove a point)

If (14) had the structure (15), it would be grammatical as (11) is:

(15) [_{CP} [_{IP} yesterday I [_{VP} PRO_i destroyed the city ([_{PRO_i} to prove a point]]]]]

Intuitively, (14) is bad since *yesterday* cannot be Agent of *destroy*. Thus the ungrammaticality of (14) suggests that external θ -marking takes place outside VP in the case of V. It follows then that there is an asymmetry between N and V with respect to external θ -marking: within its maximal projection in the former and outside its maximal projection in the latter. Although the conclusion departs from recent arguments for VP-internal subjects, this asymmetry will be crucially relevant when we discuss Control in section 4.

At this point, there may arise a question whether we can block the ungrammatical (16):

(16) *the city_i's the enemy's destruction t_i

Note that overt DP must receive Case to satisfy the Case Filter.⁴ But there is only one Case-marker, the nominal INFL, in DP. Therefore we can correctly block (16) from a Case theoretic point of view. A more problematic case is (17), which contains Agent PRO instead of overt DP:

(17) *[_{DP} [_{IP} the city_i's I [_{NP} PRO destruction t_i]]]

The S-structure representation must be barred, given the well-known contrast (18):

- (18) a. the destruction of the city to prove a point
 b. *the city's destruction (by the enemy) to prove a point

Although, apparently, we cannot block (17), we can provide a Binding theoretic account for this problem. To begin with, let us consider the SPEC position of the nominal IP. It is not unreasonable to regard this position as an A-position, given the definition of A-position in Chomsky (1981), essentially expressed in (19):

(19) An A-position is a potential θ -position.

As is well known, the SPEC of the verbal IP can be a θ -position, as in (20):

(20) [IP John [VP hit Mary]]

Thus (19) ensures that every SPEC of IP, nominal or verbal, is an A-position, even though the SPEC of the verbal IP in case of raising predicates and that of the nominal IP are not actual θ -positions. To put it differently, the positions for the nominative and genitive "subjects" are naturally grouped together as A-positions under the revised DP hypothesis, which seems to be not possible without an ad hoc stipulation under the DP analysis that does not assume the INFL projection within noun phrases (see Fukui and Speas (1986: 1.6)). It follows then that the chain (*the city*, *t*) in (17) constitutes an A-chain and the trace must meet condition (A) of Binding Theory.

As for Binding Theory, let us adopt the version proposed by Chomsky (1986a). Simply put, its condition (A) states that an anaphor must be bound in its governing category, the least CFC containing a lexical governor and a possible binder for it.⁵ Now it is obvious that the trace in (17) violates the condition (A) since it is not bound in its governing category, NP, which is the least CFC containing a lexical governor, *destruction*, and a possible binder, PRO. Hence we can correctly predict the unavailability of (17) and the ungrammaticality of (18b), a desirable consequence. Note that this account relies crucially on the assumption that noun phrases contain the category of IP, and that in this sense the revised DP hypothesis is supported.

Now let us return to RNs. In our terms, (1a), for example, is analyzed as follows:

(21) a. John could use [DP a [IP [NP good talking to

- PRO]]]
- b. John could use [DP a [IP PRO_j [NP good talking to t_j]]]
- c. John_i could use [DP a [IP PRO_i [NP good talking to t_i]]]

At D-structure PRO appears as the complement of *talking to* (a). It moves to the SPEC of IP in the mapping to S-structure (b); otherwise, it would be governed at S-structure (assume that S-structure is a level relevant for Binding Theory). Finally, it is assigned the same index as the matrix subject by Control Theory, which will be discussed in detail in section 4.

Note that our analysis accounts for SSC effects in two ways. Let us take up (4a), repeated here as (22), and consider two possible ways of generating it:

- (22) *This problem bears [everybody's thinking about]
- (23) a. This problem bears [DP [IP everybody_i's [NP t_i thinking about PRO]]]
- b. This problem bears [DP [IP PRO_i [NP everybody thinking about t_i]]]

Recall that Agent DP is within NP at D-structure and raises to the SPEC of IP to get Case. If it raises before movement of PRO, we have (23a), where PRO cannot move, an ill-formed representation with respect to Binding Theory. This is the same treatment as Clark. If PRO moves before raising of Agent DP, on the other hand, we have (23b), where Agent DP cannot receive Case, again an ill-formed representation, but with respect to the Case Filter.

It seems that our analysis is confirmed by the following contrast:

- (24) a. *The ship needs [sinking [to win the war]]
- b. The ship needs [to be sunk [to win the war]]

As argued above, Agent cannot be syntactically projected in (24a), because of movement of PRO, which generates an RN. Hence the rationale clause is not licensed. In the case of (24b), on the other hand, some implicit Agent, presumably associated with the passive morpheme, as argued in the literature, licenses the rationale clause. Note that it is true that Clark's analysis can also explain the contrast easily; but it cannot handle (11) at the same time:

- (11) yesterday's destruction of the city to prove a point

3. RNs Reconsidered.

Clark (1985) and Safir (1987) argue that RNs necessarily appear as a complement of a certain class of predicates, "predicates of requirement" in Clark's terms, some typical examples of which are given below:

- (25) need, want, require, deserve, bear, merit, could use, etc.

Clark cites the following examples to support his view:

- (26) a. *John likes [some talking to]
 b. *My room looks [a little cleaning up]
 c. *This problem appears [some thinking about]

Safir claims that those predicates are different from others in that they can dethematize the subject position of the DP complement and hence permit movement of PRO inside that complement.

Contrary to these claims, we have examples like (27):⁶

- (27) a. John hates [constant listening to (by Mary)]
 b. John complained about [frequent scolding (by Mary)]

- c. [Frequent praising by Mary] greatly satisfied
John

In (27) RNs appear as a complement of a verb that is not a predicate of requirement and of a preposition, and as a subject.⁷ Furthermore, such examples, though somewhat marginal, can be constructed productively, so long as semantic and pragmatic conditions are satisfied. This suggests that RNs appear freely, regardless of predicates, in principle. This means that RNs are just a realization of so-called action nominals. Our claim is supported by the following facts. First, it is possible that overt Theme moves inside DP that appears as a complement of a predicate of requirement:

- (28) a. I need [my coat_i's careful mending t_i (by John)]
b. John needs [Mary_i's severe scolding t_i (by Bill)]
(28') I witnessed [the city_i's destruction t_i (by the enemy)]

Second, it is also possible that no movement is involved, with Agent PRO projected, as in (29), and with overt Agent projected, as in (30):

- (29) a. I_i need [careful PRO_j mending of my coat]
b. John_i needs [severe PRO_j scolding of Mary]
(29') I witnessed [the PRO destruction of the city]
(30) a. I need [John's careful mending of my coat]
b. John needs [Bill's severe scolding of Mary]
(30') I witnessed [the enemy's destruction of the city]

To the best of my knowledge, these facts have never been pointed out in the literature, traditional or generative. Now we need no longer stipulate that RNs are sensitive to predicates that select them. In fact, we have good reasons to consider RNs as a mere realization of action nominalization, with

Theme PRO preposed inside DP. One point remains to be considered, however. Recall that PRO moved within RNs are obligatorily controlled by the matrix subject. Now notice that in (29) PRO is base-generated and is not controlled by the matrix subject. Thus we have the following contrast with respect to control:

- (31) a. My coat_i needs [DP [IP PRO_i [NP careful mending
t_i]]]
 b. I_i need [DP [IP [NP careful PRO_j mending of my
coat]]]

Our next task is to provide a principled explanation of this contrast.

4. Control Theory.

It seems that the contrast in (31) cannot be attributed solely to the difference between moved PRO and base-generated PRO, because a similar contrast cannot be found in the following:

- (32) a. John_i needs [CP [IP PRO_i to be examined t_i]]
 b. John_i needs [CP [IP PRO_i to leave]]

Rather, the crucial point seems to be the position that PRO occupies: PRO in (32a) occupies the same position as PRO in (32b) does, that is, the SPEC of IP, whereas PRO in (31a) and PRO in (32b) occupies different positions, an automatic consequence under the present analysis.

Let us consider Control Theory from this point of view. Essentially following the idea put forth by Lebeaux (1984), I propose the following condition on the interpretation of PRO:

- (33) PRO is obligatorily controlled if there is a possible controller in its *control domain*; otherwise it is interpreted as arbitrary.

The control domain is defined in terms of CFC as follows:⁸

- (34) α is the control domain for β , $\beta = \text{PRO}$, iff α is the least CFC dominating the least CFC containing β .

To illustrate the point, let us see a few examples. Observe the following:

- (35) a. [_{IP1} John_i needs [_{CP} [_{IP2} PRO to be examined _{t_i}]]] (=32a)
 b. [_{IP1} John_i needs [_{CP} [_{IP2} PRO to leave]]] (=32b)
 c. John_i believes that [_{IP1} it is important [_{CP} [_{IP2} PRO_{arb} to behave {himself_i/oneself}]]]
 d. John_i knows [_{CP} that [_{IP1} [_{CP} [_{IP2} PRO_{arb} to behave {himself_i/oneself} in public]] is important]]]

In (35a) the control domain for PRO is IP₁ since it is the least CFC dominating the embedded IP, the least CFC containing PRO, and there is a possible controller, *John*, there. Hence PRO is obligatorily controlled by *John*. The same is true of (35b). In (35c) the control domain for PRO is IP₁, which is the least CFC dominating IP₂, the least CFC containing PRO, and there are no possible controllers in IP₁ (note that expletive elements cannot control PRO since they lack semantic content and reference). Hence PRO is assigned an arbitrary interpretation. The same is true of (35d).⁹

Now let us return to our starting point (31):

- (31) a. [_{IP1} My coat_i needs [_{DP} [_{IP2} PRO_i [_{NP} careful mending _{t_i}]]]]]
 b. [_{IP1} I need _{DP} [_{IP2} [_{NP} careful PRO_{arb} mending of my coat]]]]]

In (31a) the control domain for PRO is IP₁, which is the least

CFC dominating IP₂, which is the least CFC containing PRO. There is a possible controller, the matrix subject, there, and PRO is coindexed with it, an instance of obligatory control. In (31b), on the other hand, the control domain is IP₂ since PRO is within NP, which counts as CFC. There are no possible controllers in it and PRO is assigned arb. Note that it is important here that Agent is generated within NP, a claim independently motivated in section 2.

Also crucial in this analysis is the assumption that the control domain is determined after movement; otherwise we could not get the desired results. Thus let us assume for concreteness that the control domain is determined at S-structure. There arise two problems with (31b), however. What will become of PRO in (31b) if it moves to the SPEC of the nominal IP, just as PRO in (31a) does?:

(31) b' [IP₁ I need [DP [IP₂ PRO_i [NP careful t_i mending
of my coat]]]]

Clearly, we could no longer distinguish the former from the latter: each PRO would have the same control domain, IP₁. This is a highly undesirable situation.

In this connection, we might invoke the concept of "least effort" put forth by Chomsky (1988), which legislates against superfluous elements in derivations and representations. Thus it makes movement a "last resort", preventing it from taking place freely, and minimizing the length of derivations. Now consider the movement of PRO in (32b) in this light. In this case it is "more costly" for PRO to move than to be in place, since there is nothing to force movement (note that movement of PRO is considered a "last resort" in RNs since otherwise PRO would be governed). Therefore such movement is blocked from this "economical" point of view.

Another problem with (31b) is concerned with the interpretation of PRO_{arb}. It is known that PRO_{arb} can be optionally controlled by an element in the sentence, as shown in

(35c, d). But PRO in (31b), despite the fact that it is assigned *arb*, can never be controlled by the matrix subject. It is totally unclear why this is so. This fact is reminiscent of the fact that PRO in nominal ING, unlike PRO in verbal ING, is not controlled:

- (36) a. *John_i hates [PRO loud singing to himself_i]
 b. John_i hates [PRO_i singing loudly to himself_i]

Thus it seems that PRO in (31b) cannot be controlled for the same reason as PRO in (36a) cannot. But, at present, the reason is not obvious and we have to wait for future research on this matter. Note, in any case, that the point here is that while PRO in (31a) is obligatorily controlled, PRO in (31b) is not, and that this is what we expect, given the arguments presented so far.

5. Some Related Facts.

Our claim that RNs are just a form of action nominalization has some impact on an empirical domain concerning the complement of predicates of requirement. It was often claimed by traditional grammarians that predicates of requirement necessarily take RNs when they take ING complements. Thus (37a, b) are considered to be not permitted, since each complement is not an RN:

- (37) a. *I need [mending my coat]
 b. *John needs [leaving]

But it seems that there is more to be said about such examples. Given that *need* selects "pure" nominals, but not gerunds (verbal ING), (37a) is ruled out in terms of complement selection. In the case of intransitive complements, as in (37b), there is a possibility that the complement is an action nominal, nominal ING. If our argument above is correct, nominal ING can appear as a complement of *need* since we con-

cluded that RNs are a mere realization of nominal ING. This prediction is borne out by such examples as (38):

- (38) a. John_i needs [DP [IP [NP cheerful PRO_j singing]]]
 b. ?John_i needs [DP [IP [NP careful PRO_j walking]]]

It is important to note that in (38) PRO is assigned an uncontrolled interpretation. This is what we expect, since PRO stays within NP in DP, just as PRO in (31b) is.

Next consider the following contrast:

- (39) a. They_i need [Mary's severe scolding of them_i]
 b. *They_i need [Mary's severe scolding of each other_i]

(39b) is an SSC effect and is given a Binding theoretic account. Interestingly, if the complements of *scolding* are preposed within DP, the reverse is the case:

- (40) a. ??They_i need [their_i severe scolding t_i by Mary]
 b. They_i need [each other_i's severe scolding t_i by Mary]

(40a) is reminiscent of Chomsky's (1981) avoid pronoun principle, which states that PRO is chosen over an overt pronoun where possible. Hence the relation between (40a) and (41) is just parallel to that between (42a) and (42b):

- (41) They_i need [PRO_i severe scolding t_i by Mary]
 (42) a. ??John_i would much prefer [his_i going to the movie]
 b. John_i would much prefer [PRO_i going to the movie] (cf. Chomsky (1981))

Finally, let us see the following example pointed out by Safir (1987), where the gap is embedded in an additional noun

phrase (cf. (6)):

(43) *This plan_i needs [thinking about [fixing up e]]

Safir argues that this reflects the local nature of dethematization by predicates of requirement: the process affects the first noun phrase of the complement and cannot skip a noun phrase. I have argued, however, that RNs do not involve such a special process but are a more general phenomenon. So I have to account for the ungrammaticality of (43) in some other way.

On the assumption that preposing takes place freely in DP, (43) is expected to have three representations, which I will address in turn. First of all, consider a case in which PRO moves inside the lower DP, as shown in (44):

(44) This plan needs [DP [IP₁ PRO thinking about [DP [IP₂ PRO_i fixing up t_i]]]]

In this case the control domain for the moved PRO is IP₁ and there is a possible controller, PRO, in it. Given the Control Theory introduced in the previous section, the former must be controlled by the latter. Then (44) will be interpreted as follows:

(45) This plan needs someone to think about being fixed up

Clearly, (45) does not make any sense. Hence (44) is ruled out on semantic grounds.

A second possibility is that PRO moves to the SPEC of IP in the upper DP, as shown in (46), a case that will not face a semantic problem, unlike (44):

(46) This plan needs [DP₁ [IP PRO_i thinking about [DP₂ [IP fixing up t_i]]]]

Note that intermediate adjunction of PRO is impossible since it would yield an illicit chain (recall that movement to the SPEC of the nominal IP results in an A-chain). Assuming the system of barriers proposed by Chomsky (1986b) and the version of the ECP that requires traces to be antecedent-governed suffices to block (46).¹⁰ That is, DP₂, which is a barrier for t_i since it immediately dominates a BC for t_i , IP, blocks antecedent-government of t_i by PRO_i. Therefore (46) is ruled out as an ECP violation.

The last possibility is that PRO first moves to the SPEC of IP in the lower DP and then moves into the upper DP, as in (47):

(47) This plan needs [DP [IP PRO_i thinking about [DP [IP t_i ' fixing up t_i]]]]

Here t_i is antecedent-governed by t_i' and meets the ECP. But t_i' in turn violates the ECP because of the presence of a barrier, DP. Thus (47) is also an ill-formed representation. Note that the revised DP hypothesis, again, plays an important role in accounting for (46) and (47). These considerations show that the proposed analysis correctly rules out (43) without the (undesirable and empirically inadequate) assumption that predicates of requirement dethematize the subject of its complement.

6. Conclusion.

In this paper I have argued, on the basis of Clark's observations and from a wider perspective, that RNs involve movement of PRO within DP, and that they are merely a realization of action nominals that are complements of "predicates of requirement". As a result, a wide range of facts, including those that have been unnoticed in the literature, were taken into consideration and were shown to be closely related to RNs. Further, I have claimed that the unique interpretation of RNs, which led traditional grammarians to regard them as a

peripheral phenomenon, is due to the conspiracy between the internal structure of noun phrases that the revised DP hypothesis presents and the proposed Control Theory. In this sense RNs are surely a phenomenon that falls under core grammar. Also, I have shown through the discussion that the revised DP hypothesis is quite compatible with, and in fact plays an important role in the present analysis of RNs, and that in that sense the discussion in this paper lends further support to the hypothesis.

NOTES

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¹ I will not address the issue concerning examples of the following kind:

- (i) a. This matter needs [handling carefully (by an expert)]
- b. You need [your toe seeing to (by a chiroprapist)]

See Hatori (1980) and Hantson (1984) for relevant discussion.

² Simply put, condition (A) requires that an anaphor be bound in its governing category and condition (B) requires that a pronominal be free in its governing category. Since PRO is a pronominal anaphor, it must meet both conditions, a contradiction. Thus it follows that PRO does not have a governing category.

³ Note that the SPEC of DP is assumed to be absent and that the revised DP hypothesis is different from Tonoike's "extended" DP analysis in several respects including this as-

sumption. See Takano (1988b, to appear) for relevant discussion.

⁴ The Case Filter of Chomsky (1981) is given in (i):

(i) *NP, where NP has a phonetic matrix but no Case.

⁵ CFC is defined as follows:

(i) β is a *complete functional complex* (CFC) if all grammatical functions compatible with a head dominated by β are contained in β .

⁶ Following Grimshaw (1986), I put the adjectives *constant* and *frequent* before the nominals to force the "process" reading on them.

⁷ Roeper (1988) cites the following examples, which support our view, though the examples involve TION nominals, not ING nominals:

- (i) a. The house needs protection
- b. *The house needs the police's protection
- (ii) a. Avoidance by Bill threatened Mary
- b. *Bill's avoidance threatened Mary
- (iii) a. Rome underwent destruction by Carthage
- b. *Rome underwent Carthage's destruction

As Roeper argues, these examples can be treated analogously to RNs.

⁸ I am indebted to this particular definition in terms of CFC for Toshifusa Oka (personal communication).

⁹ The following well-known example might pose a problem:

- (i) John_i knows [_{CP} how [_{IP} PRO_a to behave {himself_i/oneself}]]

That is, the proposed Control Theory might not distinguish (i) from (35a, b) and predict that PRO in (i) is obligatorily con-

trolled by *John*. But if CP counts as CFC when its SPEC is overtly occupied, the problem will disappear. In that case the control domain for PRO is the embedded CP, where there are no possible controllers.

¹⁰ Chomsky (1986b) defines barriers as follows:

- (i) γ is a barrier for β iff (a) or (b):
 - (a) γ immediately dominates δ , δ a BC for β ;
 - (b) γ is a BC for β , $\gamma \neq \text{IP}$.
- (ii) γ is a BC for β iff γ is not L-marked and γ dominates β .
- (iii) α L-marks β iff α is a lexical category that θ -governs β .
- (iv) α θ -governs β iff α is a zero-level category that θ -marks β , and α , β are sisters.

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