The Structure of *Ing*-forms Which Modify the Preceding NP[1]

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In this paper I would like to argue that the *Ing*-form modifying the preceding NP is an IP with [- Tense], not a CP(S') which is assumed in the Reduced Relative Clause analysis (henceforce RRC) and 'Whiz' deletion. The IP analysis with the principles of the Government and Binding Theory solves the problem with the CP analysis, without using the condition of deletion. It also explains why the *Ing*-form is possible only when the modified NP corresponds to the subject of the verb in the *Ing*-form. Other examples discussed here are PPs modifying the preceding NP and indirect questions. The PP exhibits the same properties as the *Ing*-form. As for indirect questions, the *Ing*-form never appears in them. Both of these examples favor the IP analysis.

*Ing-form　*CP analysis　*IP analysis　*barrier

0. Introduction

The *Ing*-affix of a verb appears in two different contexts. One functions as a gerund as shown in (1a), and the other is a present participle accompanied with the verb *be* as in (1b).

(1)　a.　Mary likes reading LGB. (Gerund)
　　　b.　Mary is reading LGB. (Participle)

In this paper, I call the present participle the *Ing*-form, which I am mainly concerned with[2]. As is well known, the *Ing*-form of a verb with the verb *be* has the progressive meaning. This type of *Ing*-form is used in various ways. (2) illustrates this.

(2)　a.　John is *reading* LGB.
　　　b.　The man *reading* LGB is John.
　　　c.　Mary saw John *reading* LGB.

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In all of the examples, the verb *reading* shows that the action of reading is in progress. But types of constructions are different. My concern is mainly the type of (2b). This has been considered to be a case of 'Whiz' deletion or a Reduced Relative Clause by Ross (1972) and Bach (1968)[3]. There are many problems with this analysis. They are mostly concerned with how the Tense in the *Ing*-form is interpreted. But the type of (2b) has not been well studied before. So in this paper, I will propose an alternative analysis within the Barriers framework proposed by Chomsky (1986).

In section 1, we will observe the phenomena involving *Wh*-movement and NP-movement. In section 2, I will argue that the *Ing*-form modifying the preceding NP is not a CP but an IP in view of the Case Theory and the Projection Principle. In section 3, I will show that this IP analysis also explains why the *Ing*-form does not have a CP projection in the indirect question, unlike infinitives. In section 4, my conclusion is shown.

1. Phenomena and Problems
1.1 Phenomena

In (2b) the *Ing*-form of the verb with its complement modifies the preceding NP *the man*. This is used as an adjunct phrase[4]. There are somesimilarities and differences between the *Ing*-form and relative clauses. Let us first observe some similarities. Consider the examples in (3).

(3)　a.　The man [$_{XP}$ reading the book] is John.
　　　b.　The man [$_{CP}$ who is reading the book] is John.

The XP in (3a) modifies the preceding NP. Similarly, the CP in (3b) which is an adjunct also modifies the preceding NP. So they exhibit the same properties with respect to the extraction possibility of the object *the book*. This is shown in (4).

(4)　a.　*What book$_i$ did [the man [$_{XP}$ reading t$_i$]] meet John?
　　　b.　*What book$_i$ did [the man [$_{CP}$ who is reading t$_i$]] meet John?
　　　c.　*What book$_i$ do you know [the man [$_{XP}$ reading t$_i$]]?

  d. *What book$_i$ do you know [the man [$_{CP}$ who is reading t$_i$]]?

  e. Who$_i$ did you see [pictures [of t$_i$]?

  Although *Wh*-movement out of an NP is possible as in (4e), *Wh*-movement out of the phrase which modifies the preceding NP is impossible in both cases as in (4a-d). This suggests that the XP and CP behave in the same way. Then how about NP-movement?

(5) a. *The man$_i$ was hit [$_{NP}$ t$_i$ [$_{XP}$ reading LGB]].

  b. *The man$_i$ was hit [$_{NP}$ t$_i$ [$_{CP}$ who was reading LGB]][5].

  (5) shows that NP-movement is impossible out of NPs. So far, we have seen the similarities between the *Ing*-form and relative clauses.

  Next we will observe three differences between them. The obvious difference is that relative clauses are tensed clauses, but the XP in (3a) is not. Secondly, Hudson (1973) shows that the interpretation of Tense is different between (3a) and (3b). While the tense in the *Ing*-form is interpreted either 'deictically' or 'derivatively', that in the relative clause is interpreted only 'derivatively'[6]. This is illustrated in (6).

(6) a. The man reading LGB was kind to me.

  b. The man who was reading LGB was kind to me.

  c. The man who is reading LGB was kind to me.

  (6a) corresponds to either (6b) or (6c). In other words, (6b) and (6c) do not always correspond to (6a). The third difference is that the object of a verb can be relativized but a similar construction is impossible in the *Ing*-form. This is shown in (7).

(7) a. *The book [$_{XP}$ the man reading] is LGB.

  b. The book [$_{CP}$ which$_i$ the man is reading t$_i$] is LGB.

  c. The book [$_{CP}$ OP$_i$ the man is reading t$_i$] is LGB.

Note that if the preceding NP corresponds to the object of the verb in the XP, the

Ing-form can not modify it. Only if the preceding NP corresponds to the subject, can the *Ing*-form modify it. So far we have seen the properties of the *Ing*-form compared with relative clauses. Next I will show some problems of the Reduced Relative Clause analysis.

1.2 Problems

There are at least three problems with the Reduced Relative Clause analysis (henceforth RRC). One is that it must assume that the relative pronoun and the verb *be* are deleted when the relative pronoun is a subject and at the same time, the tense in the relative clause is the same as that in the matrix clause. This is not a general condition, but a construction specific one.

Another problem is concerned with the recoverability condtion proposed in Chomsky (1977). The deletion rule involved in RRC violates this condition because it is impossible to recover the tense of the relative clause from the *Ing*-form as in (6).

The last problem is that RRC cannot explain, without resorting the condition mentioned above, why only the subject relative pronoun with the verb *be* allows this reduction but not (7a).

Now our task is to explain the following, solving the problems mentioned above:

(8)　a.　What is the category XP in (3a)?
　　　b.　Why is Wh-movement impossible as in (4)?
　　　c.　Why is NP-movement impossible as in (5)?
　　　d.　Why is (7a) impossible?

2. An analysis
2.1 The Category of the *Ing*-forms of Adjuncts

There are two possible analyses of (3a) beside the Reduced Relative Clause analysis. One is an IP analysis[7], and the other is a CP analysis. The CP analysis here is slightly changed into the one by the barrier-framework along the lines of RRC. Let us first consider the CP analysis. (9) illustrates this.

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(9)　a.　The man [$_{CP}$ reading LGB] is my father.

　　b.　The man [$_{CP}$ [OP$_i$] [$_{IP}$ t$_i$ be [$_{VP}$ reading LGB]]] is my father.

　　c.　*The man [$_{CP}$ who$_i$ reading LGB] is my father.

Assuming OP(erator)-movement, the operator moves to the SPEC of CP. In this analysis, the impossibility of *Wh*-movement is explained by Subjacency. The movement crosses over two barriers, NP and CP[8]. There are, however, three problems with this analysis. First, the verb *be* is to be deleted and does not appear at PF. The second problem is that we must assume that only an OP, not an overt relative pronoun, can be licensed in (9c). The third problem is that the chain (OP, t) is not licensed since it does not have a Case[9].

As for NP-movement, regardless of whether the XP is a CP or not, the movement is impossible as in (5) since the category of the XP is not relevant to the movement. What is relevant is where it moves from. This is the movement of the whole phrase except the adjoined phrase. This movement is impossible because of a constraint similar to Left branch Condition (Ross 1967), an answer to (8c). So this case does not determine which one is plausible, the IP analysis or the CP analysis.

Suppose then that the phrasal category is an IP with a PRO[10].

(10) a.　The man [$_{IP}$ [PRO][$_I$. [$_I$ be[$_{VP}$ reading LGB]]]] is my father.

In this analysis, no movement is involved. There is no A-bar chian in (10),and there is no place for a Wh-phrase to appear. So two of the problems with the CP analysis do not arise. If the adjunction site of the relative clause is the N', the IP in (10) is also assumed to be adjoined to the same position. In this paper, I assume that an IP adjoined to X' as in (10) is an inherent barrier. Then the position of PRO is not governed since IP is a barrier[11]. The tense being [-Tense], the SPEC of IP is not governed by INFL just like the case of infinitives. As for the impossibility of *Wh*-movement, it is barred because the movement crosses two barriers: the IP is a barrier by assumption, and the NP is also a barrier by inheritance. This is an answer to (8b)

Although the problem of the disappearance of the verb *be* still remains, the IP analysis explains (4) without raising two of the problems with the CP analysis.

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In addition to this, there is another example which weakly supports this analysis. Consider the following example, which has a similar construction within the NP.

(11) a. The man in the garden is my father.

    b. $[_{NP}$ The man $[_{CP}$ $[OP_i][[t_i][[be][in the garden]]]]$ is my father

    c. $[_{NP}$ The man $[_{PP}$ $[PRO][[_{p} in][_{NP} the garden]]]]$ is my father.

It is also a case of a reduced relative like (11b), where the relative pronoun and the verb *be* are deleted. In this case also we have the same problems as in (9). But if we analyze (11a) as something like (11c), it does not raise the problems[12]. Besides, there is no problem of the verb *be*. This is one of the reasons to conclude that the XP in (3a) is IP[13], answering to (8a). In the next section, we will have another reason for the same conclusion.

2.2 The Problem of Case and the A-bar Chain.

In this section, I will explain why (7a) is impossible, and another support for an IP analysis will be shown. First, let us consider (7a). It shows that if the modified NP corresponds to the object of the verb *read*, the sentence is ungrammatical. But as (7b) shows, the object of the verb *read* can be relativized. The Case theory and the Projection Principle provide the reason. The examples in (7) are repeated here.

(12) a. *The book the man reading is LGB. (=(7a))

    b. *The book $[_{IP}$ [the man][be [reading e]]] is LGB.

    c. *The book $[_{CP}$ $[OP_i]$ $[_{IP}$ the man be $[_{VP}$ reading $t_i]]]$ is LGB.

    d. The book $[_{CP}$ which$_i$ the man is reading $t_i]$ is LGB. (=(7b))

The problem in (12a) is that the subject the *man* in the SPEC of IP does not receive Case since there is no Case assigner in the IP. In (12c), it is not assigned Case, either. In this respect, the CP analysis is even with the IP analysis. It is obvious that the NP in (12d) is assigned Nominative Case by INFL with the [+ Tense] feature.

The empty category in (12b)[14] is not a trace since it does not involve movement.

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This is not a PRO either since it is governed by the verb. And *pro* is not allowed in English in general. Thus the EC in (12b) is not licensed. And the ungrammaticality is explained. In (12c), the empty element is a trace left by OP and is bound by OP. In this case, the chain (OP, t) has a Case and a θ-role assigned to the trace by the verb. The same is true of (12d)[15]. The chains in (12c) and (12d) are permitted, which raises a problem to analyze examples below.

Suppose that the problem with (12c) is only the Case of the subject *the man*. PRO should be allowed in the subject position, since this position is ungoverned as in infinitives.

(13) a.　John knows [$_{CP}$ what$_i$ [$_{IP}$ PRO to read t$_i$]].

　　　　John wants [$_{CP}$ [$_{IP}$ PRO to read LGB]].

　　b.　*The book reading is LGB.

　　c.　The book [$_{CP}$ [$_{SPEC}$ OP$_i$] [$_{IP}$ PRO be [$_{VP}$ reading t$_i$]]] is LGB.

In (13a) the chain (what, t) is licensed, and has a Case assigned by the verb *read*. PRO is also licensed in the usual manner. Then the problem with the CP analysis mentioned above with respect to (12c) lies in (13b). (13b) would be represented as in (13c) within the CP analysis. PRO is licensed for the same reason above. And the chain (OP, t) is also permitted. Assuming that the verb *be* is deleted and does not appear at PF, (13c) incorrectly predicts that (13b) is grammatical. However, (13b) is ruled out if we adopt the IP analysis because the empty element is not licensed for the same reason the empty element of (12d) is not licensed. While the IP analysis rules out (12a) and (13b) correctly, the CP analysis does not. This is another strong reason to conclude that the answer to (8a) is IP, explaining (8d) at the same time.

The same kind of phenomena with PP is explained in the same way. The following examples are ungrammatical.

(14) a.　*The park the man in is beautiful.

　　b.　*The park in is beautiful.

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Two analyses of (14) are shown in (15) and (16), respectively.

(15) a.　The park $[_{PP}$ the man $[_{P'}$ in $[_{NP}$ e]]] is beautiful.

　　 b.　The park $[_{CP}$ [OP$_i$][the man be $[_{PP}$ $[_{P'}$ in $[_{NP}$ t$_i$]]]]] is beautiful.

(16) a.　The park $[_{PP}$ PRO $[_{P'}$ in $[_{NP}$ e]]] is beautiful.

　　 b.　The park $[_{CP}$ [OP$_i$][PRO be $[_{PP}$ $[_{P'}$ in $[_{NP}$ t$_i$]]]]] is beautiful.

As is shown above, the $[_{NP}$ e] in (15a) and (16a) is not a trace since no movement is involved. It is not a PRO either, since the position is governed. Therefore, the $[_{NP}$ e] is not licensed and a lexical object must be here. Another problem in (15a) is the NP *the man* because it can not be assigned Case. Even if this position is occupied by PRO as in (16a), the $[_{NP}$ e] explains the ungrammaticality[16]. Thus, my analysis correctly rules out (14a) and (14b).

In both (15b) and (16b) the chains (OP, t) are permitted for the same reason that the chains in (12c) and (13c) are licensed. So the problem lies in the NP *the man* and PRO. The reason why the NP cannot occur, which in turn means that PRO can occur in this case, cannot rule out (16b). Thus, the CP analysis cannot explain why the examples in (14) are ungrammatical. Now we have seen the CP analysis here, let us go back to the Reduced Relative Clause analysis briefly.

If we adopted RRC, it would not have to explain the ungrammaticality of (14) since the condition of the deletion does not allow to generate (7a), (13b), (14a), and (14b). But the condition is rather a construction specific one as is mentioned in the section 1.2. The analysis proposed here explains why (7a) is impossible. The general principles in GB-theory rule out (7a) while permitting (3a). Therefore, we do not need RRC.

To summarize, I have answered the questions in (8a-d), adopting the theory of Barriers, the PRO Theorem, the Projection Principle, and Case Theory. The category XP in (3a) is an IP adjoined to the N', making a barrier which blocks the movement. In the next section, we will consider the case of the *Ing*-form in indirect questions.

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3. No *Wh*-phrase before Present Participles

In this section, I will try to apply the IP analysis to another construction and see what consequence this analysis might have. Consider first the examples in (17).

(17) a.　John$_i$ remembers what$_j$ he$_i$ is to read t$_j$.
　　　b.　John$_i$ remembers what$_j$ PRO$_i$ to read t$_j$.

Infinitives like (17b) can have a Wh-phrase before it so that PRO can not be governed[17]. But the *Ing*-form never takes *Wh*-phrase before them. Let us look at the paradigm (18)-(20).

(18) a.　　John$_i$ remembered what$_j$ he$_i$ was reading$_j$.
　　　b.　*John$_i$ remembered what$_j$ reading t$_j$.

(19) a.　　The man who is reading LGB is my father.
　　　b.　*The man who reading LGB is my father.

(20) a.　　The book which John is reading is LGB.
　　　b.　*The book which John reading is LGB.

(18) is an example of indirect question. (19) and (20) are examples of relative clauses discussed earlier. The ungrammaticality of (19b) and (20b) is explained by Case Theory. That is, *who* in (19b) and *John* in (20b) are not assigned Case.

Given the Projection Principle, the structure is something like (21a).

(21) a.　*John$_i$ remembered what$_j$ PRO$_i$ reading t$_j$. (=(18b))
　　　b.　John$_i$ remembers what$_j$ PRO$_i$ to read t$_j$. (=(17b))

The only difference in the structure is the forms of the verbs. PRO should be licensed in this position. So the problem seems to lie in the projection above the IP. As is mentioned to explain the ungrammaticality of (19b) above, if the *Ing*-form in (21a) is an IP with [- Tense] and there is no place for a Wh-phrase to appear, then

the ungrammaticality of (21a) is explained. One consequence I have reached that still needs a further investegation is that the *Ing*-form can not be the Complement of a head C with [+ WH] unlike infinitives which are also IPs with [- Tense].

4. Concluding Remarks

I have shown that the *Ing*-form modifying the preceding NP favors the the IP analysis where the *Ing*-form is specified as an IP with [- Tense]. This analysis takes the place of RRC (or 'Whiz' deletion). It explains why only the corresponding subject of the IP can be modified as in (3a) and why the corresponding object of the IP cannot as in (7a) by adopting Case Theory, PRO Theorem, and the Projection Principle. We have dealt with PP modifying NP, and indirect questions. The former shows the same behavior as the *Ing*-form. In the latter, never appears the *Ing*-form since the *Ing*-form lacks a CP projection, unlike infinitives. Lacking a CP projection in the *Ing*-form is also the reason a Wh-phrase does not appear before it[18].

One thing that we did not discuss is the disappearance of *be*. This could be related to the interpretation of tense in the *Ing*-form, or to the checking of some features in Tense as in the Minimalist Program. But I will leave this matter open.

Notes

1. The idea of this paper is developed in part in my Master's thesis.
2. As for properties of gerunds, see Reuland (1983), Sandra (1973), Wasow and Roeper (1972).
3. The Reduced Relative Clause analysis (or 'Whiz' deletion) is roughly shown in (i).
   (i) a. The man [CP who is reading LGB] is John.
       b. The man [CP e e reading LGB] is John.
   The relative pronoun and the verb *be* are deleted, where the relative pronoun is the sub-

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ject and the tense of the verb is the same as the matrix verb.

4. An adjunct here means a non-argument phrase.
5. (5a) is possible if the XP is adjoined to IP which is base-generated.
   (i) The man [$_{IP}$ [$_{IP}$ was hit][$_{XP}$ reading LGB]].
   And (5b) is possible in the case of movement as follows.
   (ii) [The man [$_{CP}$ who was reading LGB]] was hit.
   (iii) [The man t $_i$] was hit [$_{CP_i}$ who was reading LGB].
   The whole NP first moves to the SPEC of IP. Then the CP is extraposed.
6. For more discussion, see Hudson (1973).
7. The argument that gerunds do not have CP is presented in Stowell (1982).
8. In Chomsky (1986), a barrier is defined as follows.
   γ is a barrier for β, iff (i) or (ii):
   (i) an $X^{max}\gamma$ most closely dominates δ, δ a BC for β(inheritance);
   (ii) an $X^{max}\gamma$ is a BC for β, γ =/ IP(inherent).
   A Blocking Category is defined as follows.
   γ is a BC for β iff γ is not L-marked and γ dominates β.
   L-mark is defined as follows.
   α L-marks β iff α is a lexical category that θ-governs β.
   θ-government is defined as follows.
   α θ-governs β iff α is a zero-level category that θ-marks β, and α, β are sisters.
   In (9a), the CP adjoined to N' is not L-marked. So this CP is a BC which in turn is a barrier. And the NP is a barrier by inheritance.
   (9a) [$_{NP}$ The man [$_{CP}$ reading LGB]] is my father.
9. The (OP, t) is an A-bar chain, where the head of the chain is in an A-bar position and the tail of it is in an A position. In this case, a Case and a θ-role are assigned to the trace by the verb.
10. Murasugi (1991,1993) proposed that the relative clause in Japanese is an IP, not a CP. In Japanese, there is no overt relative pronoun even if relative clauses are considered to be CP. In this sense, the *Ing*-form that modify the preceding NP in Eglish is similar to relative clauses in Japanese despite that the clauses are tensed in Japanese.
11. In Chomsky (1986), an IP is not an inherent barrier. It is a barrier only by inheritance. In this sense, the IP is not a barrier even if it is not L-marked. So the definition of a barrier here is changed. That is, an IP in an adjoined position is a barrier for movement, which needs a further investigation.
12. We must assume that a P does not govern the PRO in the Spec of PP.
13. It seems to be possible to analyze this as VP if PRO is assumed to be in the VP-internal Subject position. Then the problem of the verb *be* will disappear. But the fact that bare VPs do not modify a preceding NP cannot be explained by this analysis. There seems to be some relation between the verb *be* and the *Ing*-form of verbs. In Fujimaki (1994), the *Ing*-affix with a progressive meaning is generated in an Asp(ect) Phrase, which is higher

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than a VP. In addition to this, in Principle and Parameter Theory, it is proposed that PRO must receive Null Case in the Spec of T.

14. Projection Principle requires this position be projected.
15. If the relative pronoun in (12d) is an OP, the chain (OP, t) has a Case and a θ-role by the verb *read*.

    The book [$_{CP}$ OP $_i$ the man is reading t $_i$] is LGB.
16. It might be that the PP does not have SPEC in this case.
17. Masatake Muraki (personal communication) suggested that (17b) is derived from (17a) by deletion because *is to* has a modal property.
18. Stowell (1982) argues that gerunds lack the COMP positioin.

    Taking this into a consideration, it might be that gerunds and the *Ing*-form with [- Tense] lack the COMP position. But this needs a further strudy.

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