PRO-DROP IN CHINESE:
A GENERALIZED CONTROL THEORY

In recent years considerable attention has been devoted to the study of control and pro-drop, the former referring to the occurrence of a null pronominal in the subject position of a non-finite clause and the latter to that of a null pronominal in other positions. The most important questions that surround these null elements include the following: (a) what is their distribution across languages?; (b) what are their referential properties?; and (c) how may their distribution and reference be properly accounted for within an optimal theory of grammar?

In the work of Chomsky (1981, 1982) and many others, the two null elements are generally considered to be distinct. In Chomsky (1982), these two elements are called PRO and *pro*, respectively. PRO is assumed to be a pronominal anaphor, and *pro* a pure pronominal. The occurrence of PRO is presumably universal. Within each language the occurrence of PRO is limited to the subject position of a non-finite clause. This is assumed to follow from conditions A and B of Binding Theory of Chomsky (1981), namely from the 'PRO theorem' that it occurs only in an ungoverned position. The reference of PRO is assumed to fall under a separate theory of control.

The occurrence of *pro*, unlike that of PRO, is not universal across languages. English and French, for example, do not allow a null subject within a finite clause. Languages like Italian and Spanish, on the other hand, allow a null subject within a finite clause. An important question that arises is then how to properly characterize the Pro-Drop or Null Subject Parameter. According to Chomsky (1981, 1982), the distribution of pro-drop is assumed, following Taraldsen (1978), to be determined by the principle of recoverability, or what Jaeggli (1982) terms the 'identification hypothesis.' The idea is that a pronoun may drop from a given sentence only if certain important aspects of its reference can be recovered from other parts of the sentence. In a language like Italian or Spanish, the subject of a finite clause may drop, because the agreement marking on a finite verb is sufficiently rich to recover important aspects of, or determine, the reference of a missing subject. However, in a language like English, pro-drop is prohibited from the subject position of a finite clause, because its agreement markings are too meager to sufficiently determine the reference of a missing subject. Furthermore, because the finite verb is marked only for agreement with the subject but not with the object, the identification hypothesis correctly predicts that no object may drop, either in the English type or in the Italian type of languages. The hypothesis also

claims that if a language has a way of marking the verb with sufficient features of agreement with the object, pro-drop may also occur with the latter. This prediction is borne out by the 'split ergative' language Pashto. As indicated in Huang (1984), Pashto uses a split ergative system of agreement, requiring the finite verb to agree with the subject in some sentences, and with the object in others. The pro-drop facts of Pashto show that a subject or an object may drop just in case the verb is marked for agreement with it.[1]

The identification hypothesis thus provides a plausible account not only of the distribution of pro-drop across languages, but also of the distribution of *pro* within a sentence in a pro-drop language. Furthermore, it also provides a partial account of the reference of a *pro*. The agreement marking on a verb determines the person, number and/or gender of a *pro*, and therefore important aspects of its reference. In a sense, the agreement marking (Agr) may be regarded as a kind of pronoun acting as the antecedent of a *pro*. This 'pronoun', in turn, may be free in reference like any ordinary overt pronoun.[2] Thus, the reference of a *pro* is not free to the extent that it must be determined by agreement, but free to the extent that the 'pronoun' (= Agr) may be free.

In this paper I will study the pro-drop phenomena in Chinese, and attempt to show that the pro-drop facts, though they present apparent problems for the identification hypothesis, can be most profitably accounted for within a generalized theory of control that determines the reference of both *pro* and PRO. My claim will be that the identification hypothesis is essentially correct, but that it must be more broadly interpreted than is assumed in the agreement-based theory. Section 1 is devoted to establishing Chinese as a pro-drop language and to showing that the distribution of *pro* is limited to the subject position of a finite clause, as in Italian-type languages. In section 2, I will present the proposed theory of generalized control, and show how all the essential facts about pro-drop and control follow from it. A crucial assumption underlying the proposed theory is that both *pro* and PRO have the feature of being a pronominal, as originally proposed by Chomsky. This assumption is at variance with the proposal of Manzini (1983), but in other respects the proposed theory is also similar to that of Manzini (1983). A brief comparison of our account with that of Manzini's is given in section 3.

1. PRO-DROP IN CHINESE

1.1. *Null Subjects and Null Objects*

In Chinese, both subjects and objects may drop from finite sentences. Thus, as an answer to (1), each sentence in (2) allows either or both the pronouns in it to be deleted.

(1)   Zhangsan kanjian Lisi le   ma?
        Zhangsan see   Lisi ASP Q

        Did Zhangsan see Lisi?

(2) a. (ta) kanjian (ta) le.
        he   see   he   Perf

        (He) saw (him).

    b. wo xiang (ta) kanjian (ta) le.
        I   think he   see   he   Perf

        I think (he) saw (him).

Since Chinese does not have a system of (overt) agreement, the occurrence of such null arguments (in a way even more widespread than in Italian-type languages) poses an important problem for the identification hypothesis. One might propose to formulate the identification hypothesis as a parameter of grammar rather than as a principle of UG. In Huang (1984), however, I argued that this is not the right way to approach the problem. The reason is that, appearance notwithstanding, Chinese only poses a problem for the identification hypothesis in so far as it allows null subjects, but not where it allows null objects. That is, while null subjects may be regarded as genuine null pronominals (*pro*'s), a null object is best analyzed as a variable Ā-bound by an operator that is itself null. Thus, a proper representation of (3a) would be (3b):

(3) a. Zhangsan shuo |Lisi kanjian e le|.
        Zhangsan say   Lisi see   Perf

        Zhangsan said that Lisi saw |him|.

    b. |OP$_i$|Zhangsan shuo |Lisi kanjian e$_i$ le|||

There is considerable evidence for this claim. For example, although an embedded null subject may be A-bound by a matrix subject (like any overt pronominal), a null object may not (unlike an overt pronominal). Thus, compare the following sentences:

(4) a. Zhangsan shuo |e hen xihuan Lisi|.
        Zhangsan say   very like   Lisi

        Zhangsan said that |he| liked Lisi.

    b. Zhangsan shuo |Lisi hen xihuan e|.
        Zhangsan say   Lisi very like

        Zhangsan said that Lisi liked |him|.

In (4a), the null subject may refer to the matrix subject **Zhangsan** or to some other person whose reference is understood in discourse (i.e. the

discourse topic). This is expected if the null subject is a pronominal, as an overt pronoun in the same position has the same range of interpretations. In (4b), however, the null object must refer to the discourse topic, but not to the matrix subject. This would be unexpected if the null object were a pronominal, as an overt pronoun in the same position is not subject to this restriction. The restriction is explained, however, if the null object is a variable (Ā-bound by an empty operator), since conditon C of Binding Theory correctly requires it to be A-free, preventing it from being A-bound by the matrix subject.[3]

Further evidence for this analysis is given in Huang (1984). Hasegawa (1984/85) and Raposo (1986) have argued on independent grounds for an analysis of Japanese and European Portuguese, respectively, that is consistent with the view taken here. There is also indication that a similar view may hold for German (Huang, 1984), Swedish (Elisabet Engdahl, personal communication), KiNande (Authier, 1988), American Sign Language (Lillo-Martin, 1986), etc.[4] I shall assume that this view is on the right track, and concentrate on the null subject in the rest of this paper.

1.2. *Chinese as a Pro-Drop Language*

The subject-object asymmetry exhibited by sentences like (4) shows not only that the null object is not a pronominal, but also that the null *subject* can be a pronominal. If we assume that a null pronominal is PRO only if it is ungoverned, and a *pro* otherwise, then there is reason to claim that the null subject in Chinese can be a *pro*, i.e., that Chinese is a pro-drop language. This claim can be established once it is shown that the null subject may be governed. Consider (5)—(6):

(5)   Zhangsan shuo [(ta) lai   le].
        Zhangsan say   he   come ASP

        Zhangsan said that (he) came.

(6)   Zhangsan xiangxin [(ta) hui lai].
        Zhangsan believe   he   will come

        Zhangsan believes that (he) will come.

In both examples, the embedded subject may be null or non-null. If we assume that Case Filter applies to Chinese and that the subject of a clause is assigned Case only if it is governed by an element in INFL (or AUX), then the possibility of having an embedded non-null subject shows that the subject position is governed, and the possibility of a null subject in the same position shows that Chinese is a pro-drop language.

Since this conclusion presents a problem for the identification hypothesis (given the lack of Agr in Chinese), one might attempt to avoid it by postulating that the null subject is not a governed *pro*. One possible way to

do this is to assume that the possible occurrence of a lexical subject in Chinese is not determined by the presence of a governor in AUX (or even by Case Theory in general).[5] Given this, sentences like (5)—(6) do not determine whether the null subject is governed, thus allowing one to identify it as PRO in consistence with the identification hypothesis.

One reason for this postulation is the well known fact that Chinese sentences are not marked for tense any more than they are for agreement. If, according to Chomsky (1980, 1981), the nominative subject is assigned Case in English by Tense or by Agr, then the complete absence of both Tense and Agr in Chinese may lead one to suppose that a lexical subject must be allowed in some other way than by government. However, there is reason to believe that the relevant factor that allows a lexical subject is the *finiteness* of a sentence, and that different languages may encode finiteness with different elements of AUX (cf. George and Kornfilt (1981)). In Chinese, there is a fairly systematic distinction between finite and non-finite clauses which may be made on the basis of the *potential* occurrence of any element of the AUX category (such as an aspect marker or a modal). Thus, when embedded under a verb like 'say' or 'believe', a clause may take an aspect or a modal (as in (5)—(6)), even though it need not always contain an overt AUX (cf. (7)):

(7)   Zhangsan shuo [(ta) meitian   lai].
        Zhangsan say   he   every-day come

        Zhangsan said that (he) comes/came every day.

However, when embedded under a 'control verb' like **bi** 'force', **quan** 'persuade', **shefa** 'try', etc., a clause may never take any element of AUX:

(8) a. wo bi   Lisi [e lai].
        I   force Lisi   come

        I forced Lisi to come.

   b. *wo bi   Lisi [e hui/neng/yinggai lai].
        I   force Lisi   will/can/should   come

   c. *wo bi   Lisi [e lai   zhe].
        I   force Lisi   come DUR

(9) a. Lisi shefa [e lai].
        Lisi try   come

        Lisi tried to come.

   b. *Lisi shefa [e hui/neng/keyi/zai lai].
        Lisi try   will/can/may/DUR come

   c. *Lisi shefa [e lai.   zhe/guo/le].
        Lisi try   come DUR/EXP/PERF

Sometimes, the perfective **le** and the experiential **guo** are found to occur following the embedded verb in control contexts:

(10)   wo bi   ta lai   le.
       I   force he come PERF

       I forced him to come.

(11)   wo jiao ta kan guo nide shu.
       I   tell he read EXP your book

       I have asked him to read your book.

However, such aspect markers are better construed with the matrix verb (rather, with the entire sequence including the upper and the lower verb), rather than with the embedded verb. This is evidenced by the fact that when such sentences as (10)—(11) are negated, the perfective marker **you** (a suppletive form of **le**) must precede the matrix verb.[6]

(12)   wo mei you bi   ta [e lai].
       I   not have force he   come

       I didn't force him to come.

Now, note that the subject embedded under a control verb must be null (as in (8)—(12)):

(13)   *wo bi   Lisi [ta lai].
       I   force Lisi he come

(14)   *Lisi shefa [ta lai].
       Lisi try   he come

This restriction does not apply to clauses embedded under 'say', 'believe', etc. (cf. (5)—(6)). Thus there is a clear correlation between the possibility of having an element of AUX in a clause and the possibility of having a lexical subject. More precisely, the following generalization, in the form of a left-to-right conditional, appears to hold:[7]

(15)   If the subject of a clause is obligatorily null, then the clause cannot contain an element of AUX.

If a clause contains a modal or aspect, then its subject may be either lexical or null. One possible way to derive this generalization is to postulate that, in Chinese, a clause is finite if it contains any AUX. The AUX may contain overt constituents such as modals or aspects. For sentences that exhibit the habitual (cf. (7)), we may assume that the habitual has the form of a zero-morpheme. Since AUX governs the subject, the possible occurrence of a lexical subject is expected under Case

Theory. In the case of clauses embedded under control verbs, we may assume that the control verbs are subcategorized for non-finite clauses without AUX. The embedded subject, being ungoverned, is naturally expected to be obligatorily null, unless something special happens which allows the subject to be governed from outside. Generalization (15) thus follows from the subcategorization feature of a matrix verb.

Note that if the possible occurrence of a lexical subject were not related to government by AUX, then for control sentences the obligatory absence of a lexical subject must be stated directly as a subcategorization property of control verbs. From here it is not clear how the absence of AUX may follow, and generalization (15) would be missed. I therefore conclude that the account of the distribution of lexical subjects based on government is basically correct, and that the null subject in a finite clause in Chinese is a governed *pro*.

Another way to avoid the conclusion that Chinese has *pro*'s is to postulate that the AUX in Chinese is an optional governor (cf. Hasegawa, 1984/85). Under this hypothesis, generalization (15) still follows in the way suggested above. In the case of finite clauses, the AUX optionally governs the subject position, allowing a lexical subject when it does, and allowing a null subject (PRO) when it does not. In this way, the null subject of a finite clause in Chinese is in fact a PRO, and Chinese need not be identified as a pro-drop language.

The idea of optional government, however, is also problematic. Given such a hypothesis, there seems to be no reason why the same option is not responsible for pro-drop in Italian-type languages. But if optional government were also the reason for pro-drop in such languages, then we would still have the question of why it is possible in Italian and Chinese, but not in English.[8] In other words, the idea of optional government only shifts the problem elsewhere, but does not solve it.

2. THE GENERALIZED CONTROL THEORY

2.1. *Similarities of PRO and pro*

Taking Chinese to be a pro-drop language, we must now face the question of why Chinese allows *pro* subjects in the absence of Agr. Notice, however, that this question can be asked about ungoverned PRO, too, which occurs universally in all languages, yet also in the absence of Agr. Is PRO exempt from the identification requirement?

There is a plausible solution to this problem which suggests itself once it is realized that a PRO is also often in need of identification, though in a way different from *pro* in Italian-type languages. That is, while the features

of a *pro* in Italian are identified by Agr, a PRO is identified by an antecedent NP in contexts like the following:

(16)   John tried PRO to go.

(17)   Zhangsan zhunbei [PRO gen ni   qu]
        Zhangsan prepare   with you go

        Zhangsan plans to go with you.

The generalization that this suggests is that a more general recoverability requirement applies to one single pronominal empty category (of which *pro* and PRO are two variants), requiring it to have an antecedent under appropriate conditions, where the 'antecedent' may be either Agr or an NP. If this generalization is correct, then there is a possible explanation for the existence of a *pro* in Chinese: although it cannot be admitted in the same way as a *pro* in Italian (where it is sanctioned by Agr), it may be admitted on a par with PRO, by whatever principle governs the reference of PRO.

Several similarities of PRO and the Chinese *pro* suggest the possible correctness of treating them on a par. First, like a PRO, a *pro* in Chinese is also subject to control in certain environments. Consider the following sentences:

(18)   Zhangsan qi   ma   qi   de [pro hen lei].
        Zhangsan ride horse ride till   very tired

        Zhangsan rode a horse until he got very tired.

(19)   Zhangsan ku   de [*pro* hen shangxin].
        Zhangsan cry till   very sad

        Zhangsan cried till he got very sad.

In each of these sentences, the embedded null subject must be controlled. These are instances of controlled *pro* (not PRO), because the position of the null subject can be filled with a lexical category:

(20)   Zhangsan qi   ma   qi   de [ma   hen lei].
        Zhangsan ride horse ride till horse very tired

        Zhangsan rode a horse until the horse got very tired.

(21)   Zhangsan ku   de [Lisi hen shangxin].
        Zhangsan cry till Lisi very sad

        Zhangsan cried till Lisi got very sad.

And in some cases the embedded clause may contain the perfective aspect **le**:

(22)   Zhangsan ku   de [yanlei liu-le   chu-lai].
        Zhangsan cry till tears flow-ASP out-come

        Zhangsan cried till tears came out.

Secondly, under certain circumstances a Chinese *pro* may also be free (cf. (23)), and this is also a property shared by PRO (cf. (24a—b)):

(23)   Zhangsan shuo [pro hen xihuan Lisi]. (= 4a)
        Zhangsan said   very like   Lisi

        Zhangsan said that he liked Lisi.

(24) a. It is unclear what PRO to do.

     b. [PRO xiyan] you hai.
        smoke have harm

        Smoking is harmful.

Finally, a Chinese *pro* may occur only as subject of a sentence, but not as an object, and this is again a property shared by PRO.

Note that a *pro* in Italian-type languages also shares some of these properties: it may be controlled (by Agr),[9] and it may not occur as an object.[10] These similarities of PRO and *pro* (Italian or Chinese) suggest that whatever is the correct account of the distribution and reference of one of them may be generalized in a desirable way to account for those of the other. The next subsection is devoted to showing that this can indeed be done.

2.2. Generalized Control

The theory that I propose consists of the GENERALIZED CONTROL RULE (25):[11]

(25)   Generalized Control Rule (GCR)

        An empty pronominal is controlled in its control domain (if it has one).

The notion of a control domain is defined as in (26) (cf. Manzini (1983), Nishigauchi (1984)):[12]

(26) α is the control domain for β iff it is the minimal category that satisfies both (a) and (b):

        a. α is the lowest S or NP that contains (i) β, or (ii) the minimal maximal category containing β (henceforth, MMC(β)).

        b. α contains a SUBJECT accessible to β.

(25) and (26) specify the environments in which both *pro* and PRO must have a local, unique, non-arbitrary antecedent. If a *pro* or PRO does not have a control domain, then it need not be controlled in this fashion. In the latter case, a *pro* or PRO may have long-distance or split antecedents, or its reference may be arbitrary or determined by pragmatic considerations. There are other conditions that a *pro* or PRO without a control domain must meet in order to be long-distance controlled, but I will assume that they fall outside of a proper theory of generalized control as proposed here.[13]

Note that the formulation (25) and (26) does not refer to any distinction between the governed *pro* and the ungoverned PRO. Rather, *pro* and PRO are treated as instances of the category null pronominal, subject to the same rule of control, with the notion of a control domain defined in a single way for both. According to Chomsky (1981), *pro* and PRO are distinguished both on the basis of their distribution (with respect to government) and on the basis of their inherent features (*pro* is a pronominal non-anaphor, and PRO a pronominal anaphor). According to the proposed theory, however, a proper account of the control properties of *pro* and PRO does not require their distinction in either way, and these two elements are treated alike as members of the category |+pronominal|.[14] I will now show that most of the distributional and referential properties of *pro* and PRO follow from (25) and (26).

According to (26), a *pro*/PRO (= β) has at most two *potential* control domains: the lowest NP/S containing β and the lowest NP/S containing the MMC(β). If only one of these categories contains an accessible SUBJECT, that category is the control domain. If both have an accessible SUBJECT, the lower one of them is uniquely defined as the control domain. If neither contains an accessible SUBJECT, then β does not have a control domain. Consider first positions where a *pro*/PRO has the minimal S node containing it as its control domain. As a possibility, consider a null pronominal in object position:

(27) a. *. . . |ₛ John saw *pro*|.

　　b. *. . . (for) |ₛ John to see *pro*|.

　　c. *. . . |ₛ Zhangsan kanjian *pro* le|.
　　　　　　　Zhangsan see　　　　ASP

　　　. . . Zhangsan saw *pro*.

In each of (27), the minimal clause that contains *pro* is S, and this category also contains a SUBJECT accessible to *pro*: in the finite clause (27a), the accessible SUBJECT is either the Agr or the subject *John*. In the non-finite (27b) the only accessible SUBJECT is *John*. The case of the finite (27c) in Chinese is on a par with the non-finite (27b), in that it has only Zhangsan as the accessible SUBJECT. Since *pro* has a control domain, (25) requires it to be controlled. In (27b) and (27c), the *pro* has

to be controlled by the subject. However, this would entail a contradiction with condition B of the Binding Theory, since *pro* as a pronominal must also be free in its governing category, which is also the S in (27). Similarly for (27a), *pro* cannot be coindexed with *John*, as before. It also cannot be coindexed with Agr, because the Agr marks subject-verb agreement, and coindexation of *pro* with Agr entails coindexation of *pro* with *John*. Therefore, in a language like Chinese, Italian, and English, a null pronominal is excluded from the object position.

The possibility of having an object *pro* is not excluded for a language like Pashto, however. In the following two sentences, only (28a) is ill-formed:

(28) a. *zə pro xwr- əm.
　　　I　　eat-　1msg

　　　I eat |it|.

　　b. ma pro wə-　xwar- a.
　　　I　　　PRF- eat-　3fsg

　　　I ate |it (fem.)|.

In (28a) the verb agrees with the subject, and in (28b) it agrees with the object. The object *pro* in (28a) is excluded, because it must be, but cannot be, controlled by either the subject or the subject-verb Agr, exactly as in the case of (27a). The object *pro* in (28b) is not excluded, however, because the Agr is verb-object agreement, and coindexation of the object *pro* with Agr does not entail coindexation with the subject *I* nor any violation of the Binding Theory.

Now consider null pronominals in subject position.

(29) a. *. . . |ₛ *pro* will come|.

　　b. . . . |ₛ *pro* verra|.
　　　. . . *he will come.*

In a finite clause in both English and Italian, a subject *pro* has its mother S as its control domain, because the S minimally contains it, and has an accessible SUBJECT (Agr). In Italian, the Agr is rich enough to control the *pro*; so (29b) is well-formed. In English, however, the Agr is too meager to control the *pro*; so (29a) is ill-formed. Consider now a subject *pro* in Chinese:

(30) 　　. . . |ₛ pro lai　le|.
　　　　　　　　come ASP

　　　. . . |he| came.

Unlike the case in English or Italian, the S immediately dominating *pro* is not the control domain of *pro*, because there is no accessible SUBJECT in

S. The situation is on a par with the occurrence of a PRO subject in non-finite clauses, where the minimal S is also not a control domain:

(31)   . . . [$_S$ PRO to come].

Up to now, considering only the minimal S dominating *pro*/PRO as a possible control domain, we have already derived several distributional properties of *pro*/PRO. First, for an element in object position, the minimal S is always its control domain, and a *pro* is admitted in this position just in case it can be controlled by a verb-object Agr (as in Pashto), but excluded where there is no Agr or only subject-verb Agr (as in most other languages). For a null pronominal in subject position, the minimal S is the control domain if there is Agr. In such a case a null subject is allowed if the Agr is rich enough, but disallowed if it is not. English does not allow pro-drop because a subject *pro* would always have a control domain in which it could not be properly controlled. Italian allows pro-drop because a subject *pro* always has a control domain in which it can be properly controlled. In a clause in which there is no Agr, the minimal S is not a control domain for its null subject, whether the clause is finite (as in Chinese) or non-finite (as in any language). In such a case, our theory predicts that a PRO (and a Chinese *pro*) is allowed if it has a higher category as its control domain and is properly controlled in that domain, or if it has no control domain at all.

Let us then consider the cases in which a *pro*/PRO has a higher category as its control domain. The following sentences are typical cases where a PRO in English is controlled:

(32)   John tried PRO to go. (= 16)

(33)   John forced Bill PRO to go.

Suppose that (32)—(33) have the structure (34):

(34)   [$_S$ . . . [$_{\bar S}$ [$_S$ PRO . . .]]]

In this structure, PRO has two potential control domains, the embedded S which contains it, and the matrix S which minimally contains its MMC (= $\bar S$). Since only the higher S, but not the lower S, contains an accessible SUBJECT, the higher S is defined as the control domain for PRO. In VP complement structures like (32)—(33), then, PRO has to be controlled within its immediate superordinate S.

The same applies to the case of a PRO in a postverbal adjunct, as in (35):

(35) a.   John felt tired after PRO working the whole day.

      b.   John came home early in order to PRO meet her.

Regardless of whether the postverbal adjunct in each of (35) is attached to S or to VP, these sentences also have the structure (34). Therefore, like

the PRO in (32)—(33), the PRO in an adjunct is also controlled in the matrix S. Consider now a PRO in a preverbal adjunct:

(36) a.   After PRO working the whole day, John felt tired.

      b.   In order PRO to meet her, John came home early.

Each of the PRO's must also be controlled, exactly as in (35). The result can be obtained in a similar way if a preverbal adjunct is attached to S. However, there is some reason to believe that a preverbal adjunct is attached to $\bar S$, as Reinhart (1981, 626—627) has argued. The structure of (36) is then something like (37):

(37)   [$_{\bar S}$ [PRO . . .] [$_{\bar S}$ [$_S$ John . . .]]].

Notice that in this structure the PRO does not have a control domain, since there is no NP or S dominating the adverbial clause $\bar S$ (the MMC above PRO). Even if the $\bar S$ counts as a node that satisfies the definition (26a), it still does not satisfy (26b), as the SUBJECT (John or Agr) does not c-command PRO and is not accessible to it. Preverbal adjuncts thus appear to pose a problem for the proposed theory of control.

Notice, however, that (36) poses a problem only if the control theory is assumed to obtain only at S-Structure. Suppose that the theory applies (also) at other stages, in particular a stage where the preverbal adjunct occurs postverbally, before it is preposed. This commits us to the view that such clausal adjuncts are base-generated postverbally, a view consistent with the fact that English is essentially a head-initial language. Under this assumption, the problem disappears. Since each of (36) has the structure (34) at some stage where the control theory applies, obligatory control is required.

Let us now turn to some similar cases in Chinese.

(38)   Zhangsan shefa [PRO bangmang wo].
           Zhangsan try   help   I
           Zhangsan tried to help me.

(39)   Zhangsan bi   Lisi [PRO yonggong].
           Zhangsan force Lisi   diligent
           Zhangsan forced Lisi to work hard.

These sentences have the same structure as (32)—(33) and, like the latter, involve obligatory control. Similarly, the empty subjects in the resultative clauses in (40) are controlled:

(40) a.   Zhangsan qi   ma   qi   de [*pro* hen lei]. (= 18)
           Zhangsan ride horse ride till   very tired
           Zhangsan rode a horse until he got very tired.

(40) b. Zhangsan ku de |pro hen shangxin|. (= 19)
      Zhangsan cry till   very sad

      Zhangsan cried till he got very tired.

Recall that the empty subject in each of (40) is a governed *pro*, not PRO (see the discussion centering around (18)—(22)). However, regardless of their difference in government, *pro* and PRO are treated alike under our theory. The claim that the *pro* in (40) is subject to grammatical control is further evidenced by (41):

(41) a. Lisi, Zhangsan ku de |ta hen shangxin|.
       Lisi Zhangsan cry till he very sad

       Lisi, Zhangsan cried till he (Lisi) got very sad.

    b. *Lisi, Zhangsan ku de |pro hen shangxin|.
       Lisi Zhangsan cry till   very sad

In (41a), the pronoun subject of the resultative clause must refer to the topic **Lisi**. This is expected since the clause following the topic must be a comment about the topic. When the overt pronoun is replaced by a *pro*, as in (41b), the sentence becomes very odd. The *pro* in (41b) cannot refer to the topic, but must refer to the subject **Zhangsan**, so the sentence is as odd as 'As for Lisi, Zhangsan cried until he (Zhangsan) got very sad', where the comment clause hardly says anything about the topic. That this odd interpretation is forced upon (41b) is a direct consequence of our theory. In (41b), the control domain for *pro* is the matrix S, which includes the matrix subject **Zhangsan** but not the topic **Lisi**. The GCR thus requires the *pro* to be controlled in the S, by **Zhangsan**. We thus see that both in English and Chinese, PRO/*pro* in a VP complement or postverbal adjunct must be controlled. When we turn to preverbal adjunct clauses, a difference arises between the two languages.

(42) a. |pro yi   hui   dao jia|,   Zhangsan jiu   ku.
        once return to   home Zhangsan then cry

      As soon as he arrived home, Zhangsan began to cry.

    b. |ruguo *pro* bu lai|,   ta keneng hui shengqi.
       if   not come he possibly will angry

      If we/you . . . don't come, he will probably be angry.

    c. |wulun   *pro* shuo shenme|, ta dou bu xiangxin.
       no-matter   say what   he all   not believe

      Regardless of what one says, he won't believe it.

(42) d. wo xiang ||*pro* jianmian yihou|, ta hui huan qian|.
       I   think   meet   after   he will return money

      I think that after we (he and I) meet, he will return the money to me.

These examples show that a *pro* in a preverbal adjunct need not be controlled. It may refer to **Zhangsan** as in (42a), or it may refer to someone else (42b), or it may have arbitrary reference (42c), or even split antecedents (42d). (For more examples and related discussion, see D.-F. Huang (1985).)

Although these sentences contrast with preverbal adjunct clauses in English, the difference actually follows from our theory and a difference in phrase structure between the two languages. As we saw in connection with (36), a PRO in a preverbal adjunct does not have a control domain at S-Structure. This also obtains with the *pro* in each of (42). Thus, the fact that *pro* in (42) need not be controlled is no surprise. It was suggested that the sentences in (36) are subject to control because there is, in English, a level of representation where the preverbal adjunct actually occurs postverbally. In the case of Chinese, however, there is no evidence that the preverbal adjuncts in (42) come from any other, more 'basic' position. In Chinese, except for resultative clauses (which occur postverbally), adverbial clauses occur most naturally in sentence-initial position (under S̄, à la Reinhart). Although non-clausal adverbial adjuncts may occur either sentence-initially or immediately after the subject, this latter position does not seem to take clausal adjuncts.[15] There is then reason to assume that the adjuncts in (42) are base-generated in sentence-initial position, a view consistent with the fact that Chinese is basically a head-final language (see Huang (1982), A. Li (1985), and references cited.) If so, then in each of (42) the *pro* does not have an accessible SUBJECT, nor a control domain, and is not grammatically controlled.

Up to now, we have seen that the generalized control theory correctly predicts that *pro* and PRO having a control domain are allowed just in case they are properly controlled in that domain. The theory also predicts that if any instance of *pro*/PRO is found to be uncontrolled (either by Agr or NP), then the *pro*/PRO has no control domain. Let us turn to more cases of uncontrolled *pro*/PRO.

The following sentences illustrate constructions in which a PRO is uncontrolled in English. These include those in which the PRO is contained in a sentential subject or in a sentential complement under verbs like *say*, *wonder*, etc.

(43) a. |PRO smoking| is harmful.

    b. |PRO to behave oneself| is important.

(44) a. John and Bill discussed [PRO behaving oneself].

   b. John said [PRO to behave oneself].

(45) a. John wonders [how [PRO to behave oneself]].

   b. It is unclear [what [PRO to do]].

In Chinese, a *pro*/PRO may also be free if contained in a sentential subject or in a sentential complement under *say, ask*, etc.

(46)   [*pro*/PRO xiyan] you hai.
           smoke have harm

      Smoking is harmful.

(47) a. Zhangsan shuo [*pro*/PRO mingtian bu bi lai].
     Zhangsan say   *tomorrow not need come*

     Zhangsan said that he/she/we/one . . . need not come tomorrow.

   b. Zhangsan wen [*pro*/PRO yao-bu-yao lai].
     Zhangsan ask   *should-not-should come*

     Zhangsan asked whether he/she/you/one . . . should come or not.

Consider first PRO in a sentential subject, the case of (43) and (46). In (43a), the minimal NP/S dominating PRO is the sentential subject S, but this category does not have an accessible SUBJECT. The minimal NP/S dominating the MMC above PRO is the matrix S, but this category also does not have an accessible SUBJECT, due to the i-within-i condition (see Chomsky (1981, 211ff)). Therefore, PRO does not have a control domain in (43a), and the GCR correctly predicts that it may be uncontrolled. The same applies to (43b) and (46).

When we turn to (44)—(45) and (47), a problem arises. According to most current assumptions, sentential complements like those in (44)—(45) and (47) are dominated by $\overline{S}$ which is in turn directly dominated by VP. The structure of such sentences is therefore exactly like that of obligatory control sentences like (32)—(33) and those like (38)—(39), namely the structure (34). As we saw, within such a structure the complement PRO subject has the matrix S as its control domain. However, although a PRO must be controlled in sentences like (32)—(33) and (38)—(39) as predicted by the GCR, a *pro*/PRO may be uncontrolled in (44)—(45) and (47), contrary to what the GCR requires.

Apparently, the difference between the two sets of sentences with respect to their control properties has to do with the choice of a matrix verb. Verbs like *try, manage, fail, condescend, decide, force, persuade, allow, order, permit*, etc., require obligatory control of the subject PRO of

their complements. But verbs like *say, ask, wonder, know*, etc., do not require obligatory control. One easy way to account for this difference is to mark the appropriate verbs with [+OC] for obligatory control, and add to (25) the following proviso:

(48)   A null pronominal within a complement clause is controlled in its control domain only if the matrix verb is [+OC].

Though this direct stipulation will account for the difference between obligatory and non-obligatory control, there is, I believe, a better alternative to follow. I will first present this alternative and show how it works. In 2.3., I will provide some arguments in its favor.

The suggestion I make is that we return to an analysis of sentential complementation along the lines of Rosenbaum (1967). In particular, assume that the complement $\overline{S}$ of (32)—(33) and (38)—(39) is directly dominated by VP (as in (49)) below, but that in the case of (44)—(45) and (47) there is an intervening NP exhaustively dominating the $\overline{S}$ (as in (50)):

(49) $[_S \ldots [_{VP} \ldots [_{\overline{S}} [_S pro/\text{PRO} \ldots]]]]$.

(50) $[_S \ldots [_{VP} \ldots [_{NP} [_{\overline{S}} [_S pro/\text{PRO} \ldots]]]]]$.

That is, a verb like *force, try*, etc., subcategorizes directly for an $\overline{S}$ complement, while a verb like *say, know*, etc. subcategorizes for an NP. Furthermore, NP may expand as $\overline{S}$. The $\overline{S}$ in (49) is a case of VP-complementation, but that in (50) is a case of NP-complementation.[16]

It can be seen that the difference between (49) and (50) makes a difference with respect to whether or not a given *pro*/PRO is subject to obligatory control. In (49), the *pro*/PRO has the matrix S as its control domain, as we have seen in connection with (32)—(33) and (38)—(39). In (50), however, the *pro*/PRO does not have a control domain. This is because, if the *pro*/PRO had a control domain, it would be either the embedded S (which minimally contains it) or the NP under VP (which minimally contains $\overline{S}$, its MMC). However, neither the embedded S nor the NP contains a SUBJECT accessible to *pro*/PRO. In a structure like (50), therefore, a *pro*/PRO need not be controlled, as in (44)—(45) and (47).

According to the proposed alternative, then, whether a complement subject *pro*/PRO is subject to control or not is treated as a configurational matter. Although the difference between obligatory and non-obligatory control is related to a difference in the nature of given matrix verbs, the relation is only indirect. This is different from the approach represented by (48), where the difference is taken to be a lexical matter and directly stipulated as such by the use of a lexical feature like [+OC]. In the next subsection, I will present arguments in favor of the configurational but against the lexical approach.

2.3. *On the Configurational Nature of Control*

In considering the two approaches, note first that there are cases of obligatory control that are obviously induced by structure but not by lexical properties. For example, the *pro*/PRO subjects of certain adjunct clauses are controlled in English and Chinese, as shown in (35)—(36) and (40)—(41). This obviously has nothing to do with the lexical properties of their main verbs, but must be accounted for by reference to their structure.

Secondly, there are familiar independent arguments in favor of adopting the classical analysis of Rosenbaum, which postulates the two different structures (49) and (50) for verbs of different kinds. For example, only complements of verbs like *say, know*, etc. may be passivized or pseudo-clefted, and only such verbs may take phrasal, non-sentential NPs as complements:

(51) a. That he would come was never said.

b. What he said was that he would come.

c. He said the right thing.

(52) a. *To go was forced John.

b. *What he forced (John) was (for John) to go.

c. *He forced (John) the task.

These differences may be naturally accounted for if we assume with Rosenbaum that *say*-type verbs take NP complements and *force*-type verbs take S̄ complements.

Another fact that supports this hypothesis is that under *say*-type verbs a clause may be either finite or non-finite in form, but under *force*-type verbs a clause is limited to the non-finite form. Assuming that subcategorization is a local matter, this difference can be captured in the following way. Since *say* subcategorizes for NP and not for S̄, it cannot be marked for the finiteness of the S̄, from which it follows that the S̄ may be finite or non-finite. But since *force* subcategorizes for S̄, a direct marking on its head (INFL) as [−tense] will ensure that the S̄ is always non-finite.

Each piece of evidence in support of making a distinction between structures of verbal complementation (as in (49)) and structures of nominal complementation (as in (50)) is a piece of evidence for the configurational approach taken here to the distinction between obligatory and non-obligatory control, for our theory predicts that a structure involves non-obligatory control only if it involves (50), but not if it involves (49). That is, the configurational approach captures the following generalization:

(53)   If the *pro*/PRO subject of a complement clause is not obligatorily controlled, then the clause may be passivized, pseudo-clefted, etc., showing signs of being an NP.

On the other hand, under the lexical approach represented by (48), the generalization cannot be captured. Although (48) correctly requires the PRO in (32)—(33) and (38)—(39) to be controlled, it does not relate this to the fact that such sentences also cannot undergo passivization or pseudo-cleft formation.

It should be pointed out that the generalization (53) holds in only one direction and that the reverse does not hold. If a clause shows signs of being an NP by the standard tests of Passive, Pseudo-Cleft, etc., its subject *pro*/PRO may be free (as in (44)—(45) and (47)), but it may also be subject to obligatory control. The latter case happens, in particular, with Equi verbs like *prefer, want, hate, hope*, etc.:

(54) a. John prefers PRO to behave himself/*oneself.

b. John prefers PRO behaving himself/*oneself.

The following shows that the complements of Equi verbs are NPs:

(55) a. What John prefers is for Bill to go.

b. For Bill to go is preferred by John.

If the complement is headed by a lexical NP, no control is required:

(56)   John prefers the practice of PRO behaving oneself.

To account for these facts, I propose that Equi verbs are like *say*-type verbs at D-structure but like control verbs at S-Structure. More specifically, Equi verbs have the property of deleting (or ignoring) the NP dominating S̄ when the NP does not branch (or does not L-contain the S̄; see note 16). Thus, deletion of the NP node will occur in (54) but not in (56). The result of deletion is a structure identical to one that requires obligatory control, namely the structure (34). Therefore, the PRO in each of (54), but not in (56), has a control domain and must be properly controlled in it.[17]

Turning now to raising verbs, we know that they do not allow PRO in their complements:

(57) a. *John believes PRO to be honest.

b. *It seems PRO to be honest.

If we assume with Chomsky that such verbs delete S̄ (in addition to NP), the correct result can be obtained. In both cases, PRO has the matrix S as its control domain and must be controlled by the matrix subject. But this would entail a violation of condition B of the Binding Theory.

Although the proposal to make a distinction between (49) and (50) as first suggested by Rosenbaum (1967) has been abandoned by many writers within the Extended Standard framework, it seems that this has been done without sufficient reason. Admittedly, not every argument that has been adduced in support of postulating the structure (50) as opposed to (49) holds today. For example, the fact that certain verbs may be

followed either by clausal complements or by NP complements need not require the postulation that their clausal complements are NPs, as such verbs may be simply assumed to subcategorize for the natural class of clause and NP, given a proper theory of categorial features (cf. Chomsky (1970) and Jackendoff (1977)). However, it remains a fact that the property of being capable of undergoing Passive and Pseudo-cleft is not a joint property of NP and clauses, given that verbal complement clauses under *force*, etc., cannot undergo such processes. Thus, the idea of a natural class does not explain the contrasts between (51) and (52) for the most part. And to the extent that the distinction between (49) and (50) is motivated, a proper distinction between obligatory and non-obligatory control is predicted by the proposed theory.

Summarizing, the distribution and reference of both *pro* and PRO can be derived from the control theory as proposed in (25) and (26). A *pro/*PRO is excluded precisely where it has a control domain but is not controlled in that domain. This includes the object position of a sentence (except where there is verb-object Agr as in Pashto) and the subject position within a finite clause in English-type languages, or a non-finite clause under a raising verb. It is allowed where it has a control domain and is controlled in it, and where it has no control domain. Where a *pro/*PRO is allowed, its reference is either determined by its controller (if it has a control domain), or free (if it has none). The former case happens with the ungoverned PRO subjects of adjuncts and complements under control and Equi verbs, as well as with the governed *pro* subject of finite clauses of Italian. The latter case happens with PRO in sentential subjects and complements to *say*-type verbs. The governed *pro* in Chinese patterns with the ungoverned PRO, grammatically controlled if occurring in postverbal adjuncts but free if embedded in a preverbal adjunct or under *say*-type verbs.

Notice that because our theory has treated *pro* and PRO alike, it has the effect of deriving part of the PRO theorem, that PRO is ungoverned, of Chomsky (1981). Chomsky assumes that PRO has the features [+pronominal, +anaphor], and derives the PRO theorem from conditions A and B of the Binding Theory. The PRO theorem excludes PRO from the object position of a sentence and from the subject position of finite clauses in all languages. But notice that the generalized control theory also excludes a PRO wherever it excludes a *pro*. A PRO in the object position in English, Italian, or Chinese, or a PRO in the subject position of a finite clause in English would be excluded in precisely the same way that a *pro* is excluded from such positions. In these cases, then, the proposed control theory renders the PRO theorem unnecessary. There are a few positions from which a PRO is excluded by the PRO theorem but allowed by the generalized control theory, namely positions where a *pro* is allowed — the

object position in Pashto and the subject position in a finite clause in Chinese and Italian. However, these cases provide evidence for the PRO theorem only to the extent that there is independent evidence for the existence of a category PRO with the features [+pronominal, +anaphor] distinct from *pro* as a pure [+pronominal]. That is, it may be that Chomsky's assumption simply creates a hypothetical category in these latter positions from which it is excluded by the PRO theorem, but one which may not exist in the first place. If we assume that PRO and *pro* are not distinct in their features, namely that there is only one null pronominal, [+pronominal], then there is nothing to exclude from these positions.

In view of the redundancies between the PRO theorem and the proposed theory of control,[18] then, it seems plausible (though not necessary) to assume that there are only three distinct empty categories: NP-trace, variable, and *pro*/PRO. This typology of empty categories mirrors that of lexical categories: there are lexical anaphors, names, and pronouns, but no lexical pronominal anaphors. This may be considered a desirable result, in that it eliminates an otherwise peculiar asymmetry between lexical and empty categories.[19]

3. CONTROL OR BINDING?

Having put forth a generalized control theory and shown how it works to derive the major properties of *pro* and PRO, I will now conclude with a brief comparison with the theory of Manzini (1983). As indicated earlier (cf. note 12 and the introductory section), the theory proposed here is adapted from Manzini (1983) and is in several ways similar to it. A comparison of the two accounts is thus appropriate.

Manzini (1983) attempts to derive the properties of the ungoverned PRO within a generalized theory of anaphor binding. Central to her theory are the notions 'governing category' (58), 'domain-governing category' (59), and the revised Binding Theory (60), plus the assumption that PRO is an anaphor:[20]

(58) α is a governing category of β iff

    a. α is the minimal NP/S that contains β and a governor for β, and

    b. α contains a SUBJECT accessible to β.

(59) α is a domain-governing category of β iff

    a. α is the minimal NP/S that contains the MMC(β) and a governor for the MMC(β), and

    b. α contains a SUBJECT accessible to β.

(60)   A.   An anaphor is bound in its governing category.

A'.   An anaphor without a governing category is bound in its domain-governing category.

B.   A pronominal is free in its governing category.

There is an obvious similarity between the notion 'control domain' and the combination of 'governing category' and 'domain-governing category'. In particular, both theories specify a local domain in which a given element must have an antecedent and allow for cases in which it may be unbound. Furthermore, both require the potential domain in which a given element has to be bound to be an NP or S. Also, in both cases, the local domain defined contains either β itself or the MMC above β.

The most important difference between Manzini's theory and the one proposed here is that while her theory is a generalized theory of binding, ours is a generalized theory of control. That is, Manzini attempts to eliminate the control theory by deriving the properties of PRO from a revised theory of binding. On the other hand, I have tried to eliminate the need for a theory of pro-drop by deriving the properties of *pro* from a generalized theory of control.

For Manzini, what is important is that PRO is an anaphor, so that it will fall under conditions A and A' of the Binding Theory (60). In fact, she assumes that PRO is a pure anaphor, and not a pronominal anaphor. For me, what is important is that PRO is a pronominal, so that it may be required to obey condition B, and I have assumed that PRO is simply *pro*, a pure pronominal. Thus, both theories recognize only three distinct empty categories: anaphors, pronominals, and variables. They differ in whether PRO is analyzed as a pure anaphor or as a pure pronominal.

Let us compare the two theories with respect to their account of the distribution of PRO. Since PRO is not considered a pronominal anaphor, neither theory recognizes the PRO theorem. We have seen that the generalized control theory correctly excludes PRO (= *pro*) from all positions in a clause in which it cannot occur (but cf. note 18). Within Manzini's generalized binding theory, some distributional properties of PRO are also accounted for. Thus, PRO as an anaphor is prohibited in the subject position of finite clauses on a par with a lexical nominative anaphor: it must be, but cannot be A-bound in its governing category. In the context of sentences like (61), the PRO is required to be bound by the expletive:

(61) a. *It seems [PRO to be honest].

b. *It was killed PRO.

c. *There was killed PRO.

But since the expletive cannot receive a Theta-role, these sentences are ruled out by Theta Theory. On the other hand, her theory does not itself rule out a PRO from the object position of an active sentence, as in (62):

(62)   *They saw PRO.

This is because a PRO in such a position has a governing category in which it can be bound by its own subject, and therefore get interpreted as an empty reflexive or reciprocal. To account for the non-occurrence of sentences like (62), therefore, Manzini postulates that PRO cannot be Case-marked. This assumption is unnecessary within the theory proposed here.

Another difference between the two theories is that while the notion of government is not involved in the formulation of generalized control, it is important in the formulation of generalized binding. We have seen that both PRO and *pro* may be subject to control and that both may be free. Our theory expresses this similarity by treating them alike, without reference to their difference in government. As Manzini (1983, 442—443) has shown, sentences like (63)—(64) favors a simplification of her theory in which the notion of a governor is eliminated:

(63)   John asked Bill PRO to go.

(64)   Mary knows that PRO to behave oneself is important.

The simplified version of the theory involves the notions 'binding category' (65), 'domain-binding category' (66) and the new Binding Theory (67):

(65) α is a binding category for β iff

a. α is the minimal NP/S containing β, and

b. α contains a SUBJECT accessible to β.

(66) α is a domain-binding category for β iff

a. α is the minimal NP/S containing the MMC(β), and

b. α contains a SUBJECT accessible to β.

(67)   A.   An anaphor is bound in its binding category.

A'.   An anaphor without a binding category is bound in its domain-binding category.

B.   A pronominal is free in its binding category.

The reason why the formulation (58)—(60) can be simplified to (65)—(67) in these cases is easy to see. According to (65)—(67), the PRO in (63) does not have a binding category but has a domain-binding category (the matrix S). The PRO in (64) has neither a binding category nor a domain-

binding category. Therefore, (65)—(67) correctly predict that the PRO is subject to control in (63) but not in (64).

However, Manzini (p. 444) also shows that sentences like (68)—(69) resist simplification of her theory along the lines of (65)—(67):

(68)   The boys believe [them to be honest].

(69)   John considers [him stupid].

The reason is that, under the formulation (65)—(67), the pronoun in each of (68)—(69) does not have a binding category, since the embedded S has no accessible SUBJECT. There is then nothing in the binding theory (67) to ensure that the pronoun is disjoint in reference from the matrix subject. But if the domain of binding does require a governor (as in the earlier version (58)—(60)), then each pronoun in (68)—(69) has the matrix S as its governing category, and disjoint reference is correctly predicted.

The fact that (63)—(64) allow a simplification that does not involve the notion of government shows that matters related to PRO need not involve government. This is already captured in the generalized control theory. However, sentences like (68)—(69) show that the presence of a governor is important in the formulation of the Binding Theory. According to Manzini's account, both (63)—(64) and (68)—(69) are accounted for within the same theory of generalized binding, and a dilemma arises between having a simplified formulation for (63)—(64) and having a correct account for (68)—(69).

According to the proposed account, however, (63)—(64) fall under the generalized control theory, but (68)—(69) fall under the Binding Theory, and no similar dilemma arises.

Still another major difference between the two theories under consideration is the following. I assume that both control and binding theories are needed. The two theories together account for the properties of anaphors, PRO/*pro*, etc., and eliminate an otherwise necessary theory for pro-drop. Manzini assumes a generalized binding theory which subsumes binding and control, but since she does not address the properties of pro-drop, we are still in need of a theory of the pro-drop parameter such that it will allow pro-drop in Italian-type and Chinese-type but not in English-type languages, and ensure that a *pro* (with definite reference) is excluded from the object position in all these languages. Note that it would be difficult to derive the properties of *pro* from her generalized binding theory. For if *pro* is [+pronominal], then all the binding theory says is that it must be free in its governing category, but there are other properties of *pro* to be accounted for. It would be a mistake, furthermore, to assume *pro* to be the anaphor PRO, and try to account for the pro-drop parameter within binding theory. This strategy would entail an extension of the notion of binding, so that Agr could count as a possible A-binder.

While this could allow *pro* in Italian and Chinese and disallow it in English, it would wrongly exclude every finite sentence with an overt pronoun subject, which would be A-bound by Agr in its governing category, in violation of condition B.[21]

This comparison with Manzini's account is probably too brief to give full justice to her theory. However, for reasons just noted and in the absence of a clear theory of pro-drop in her account, I will assume that PRO and *pro* are instances of the same category, and that the properties of PRO/*pro* fall under a proper theory of generalized control but not one of generalized binding.

NOTES

¹ Given that some governed *pro*'s are objects in Pashto, the occurrence of a governed *pro* is better termed the 'pro-drop' than the 'null subject' phenomenon.

² By interpreting Agr as a 'pronoun', I am not suggesting that Agr can be identified with a clitic or incorporated pronoun. Many languages, in addition to marking their verbs with agreement features, also have a separate system of clitics. In some cases, whether a given marking on a verb is Agr or a clitic is not easily determined. For interesting discussions, see Brandi and Cordin (1981), Safir (1984), Rizzi (1986b), McCloskey and Hale (1984).

³ The contrast between (4a) and (4b) should be understood as one in the possibility of referential dependency in the sense of Evans (1980), and not in the possibility of mere co-reference. The observational claim made here concerning the existence of a subject-object asymmetry is denied in Xu and Langendoen (1985) and Xu (1986). See Huang (1987) for a reply to their position.

⁴ There still remains the question as to why Chinese-type languages (but not English- or Italian-type languages) allow object variables bound by empty operators as in (3). Since this paper is concerned only with null pronominals, we will not go into it here. For some discussion, see Huang (1984), Hasegawa (1984/85), Raposo (1986). The question of whether our view may hold universally cannot be taken up here. For indication of some possible problems, see Chung (1984) and Cole (1987). Also, I will not address the status of the generic null object in certain languages. Rizzi (1986a) has convincingly argued that Italian allows null objects. The status of such null elements, however, is still somewhat controversial. While Rizzi argues that they are *pro*'s, Campos argues from Spanish that they are variables. As Rizzi notes, his theory of *pro* does not carry over to Chinese-type languages, where the null object has definite reference.

⁵ As suggested in Ross (1984), though Ross' concern is not to determine whether Chinese is a pro-drop language.

⁶ This raises the question of how -*le* as a suffix can be attached to a V-NP-V sequence. A. Li (1985) and M. Li (1985) independently propose that the V-NP-V is reanalyzed as a complex verb. As evidence for this, A. Li cites the fact that the object NP in this sequence

cannot be an empty category (in violation of the Lexical Integrity Hypothesis or her version of the ECP). Compare **wo bi Lisi mai-le liangben shu** 'I forced Lisi to buy two books,' with the ungrammatical *__Lisi, wo bi t mai-le liangben shu__, 'Lisi, I forced to buy two books'. In addition, M. Li indicates that Passive and the so-called **Ba**-transformation, whose application is usually clause-bounded, allows apparent long-distance extraction in these constructions. As an example, the sentence **wo pai ren zhua-zou le Zhangsan** 'I sent someone to arrest Zhangsan', can have as its passive counterpart the sentence **Zhangsan bei wo pai ren zhua-zou le**, literally 'Zhangsan was *sent-someone-to-arrest* by me,' meaning that Zhangsan was arrested as a result of my sending someone to arrest him, where *sent-someone-to-arrest* behaves as a complex verb. (Examples of this kind were reported earlier in Huang (1974).) Facts of this kind, of course, provide further evidence for the idea that **le** is not attached to the lower verb alone in sentences like (10) in the text. At the same time, note that reanalysis seems to affect only possibilities of extraction, but not those of coreference. For example, in a sentence like **Zhangsan bi wo da ta** 'Zhangsan forced me to hit him', the pronoun **ta** can be bound by *Zhangsan*, suggesting that with respect to condition B of the Binding Theory, **ta** and **Zhangsan** are not clausemates. The same conclusion can be derived from **Zhangsan bi wo piping-le ziji** 'Zhangsan forced me to criticize', where the reflexive **ziji** cannot refer to **Zhangsan**.

⁷ The generalization does not hold from right to left, because in some cases even though a clause cannot contain an (overt) AUX, it still may have a lexical subject. For example, clauses containing stative verbs and verbs in the habitual tense never contain aspects or modals, though they allow lexical subjects. Furthermore, clauses under matrix verbs like *want* must be non-finite, but again they may also contain lexical subjects:

(i)   wo yao |(Lisi) qu|.
         I   want   Lisi   go

         I want (for Lisi) to go.

⁸ In Chomsky (1981), Italian is assumed to have the option of applying affix-hopping (his rule R) in Syntax, thereby leaving the subject position ungoverned at S-Structure. This in effect identifies with PRO what he later calls a *pro*. The problem with this assumption is the same as the idea of optional government: why do Italian and Chinese have the option of applying rule R in Syntax, but not English?

⁹ Suñer (1985) points out that under certain predicates a *pro* in Spanish has to be controlled by an antecedent; she also points out (Suñer 1983) that a *pro* can be arbitrary in reference.

¹⁰ At least not with definite reference (cf. Rizzi 1986a, Campos 1986, and note 4.)

¹¹ This formulation of the Generalized Control Theory will supersede that proposed in Huang (1984), which essentially adopted the analysis of control proposed in Chomsky (1980), Rosenbaum (1967). As noted in Huang (1984), the earlier formulation was defective in that it did not permit the occurrence of arbitrary or uncontrolled PROs. It also incorrectly required a *pro* in Chinese to be grammatically controlled everywhere it occurs.

¹² This definition of a control domain owes much to Manzini's formulation of binding theory. I return in section 3 to a brief comparison with her account.

¹³ Long-distance control (or 'Super-Equi') is subject to the constraint that there is no intervening potential controller between the PRO and its actual controller. For example, among (i)—(iii) below, the first two are ill-formed:

(i)   *John thinks that Mary knows that PRO to behave himself is important.

(ii)   *That PRO making a fool of himself disturbed Mary surprised John.

(iii)   John thinks that PRO to behave himself is important for Mary.

With regard to what counts as an intervening potential controller, it seems that this has to do with the notion of 'distance': a 'clausemate' is closer to a PRO than a non-clausemate,

a c-commander closer than a non-c-commander, and a commander closer than a non-commander. For different formulations of the intervention constraint, see Perlmutter and Soames (1979) and references cited there. Incidentally, the reader familiar with Huang (1984) may find that the subject-object asymmetry observed in constructions involving the Left Branch Condition and Subjacency, as discussed in section 3 of that paper (pp. 560–563), does not follow directly from (25)—(26). It seems more appropriate to let the asymmetry follow from the intervention constraint on long-distance control.

¹⁴ This is not to say that they cannot be distinguished in either way. Although I shall assume that *pro* and PRO have the same feature of being a pure pronominal, this assumption is not required by the theory of generalized control itself. (This assumption raises a question about the origin of the PRO theorem, which will be addressed in some detail below.) Furthermore, whether or not a given null pronominal is governed seems to play an important role in other modules of grammar. For example, Safir (1982) observes that only the governed *pro* may be expletive. Safir (personal communication) also points out that only the governed *pro* may act as a resumptive pronoun. The latter case may be explained if an empty resumptive pronoun is reanalyzed as a variable in LF after Ā-coindexing takes place (along the functional definition suggested in Chomsky (1982)). The ECP would allow only governed *pro*'s to be Ā-bound.

¹⁵ It is most natural for the clausal adjuncts to appear sentence-initially as they do in each of (42). Clausal adjuncts like those in (42) may appear after the subject as shown in (i):

(i)   Zhangsan, Lisi yi   hui   dao jia, jiu ku.
         Zhangsan Lisi once returned to home then cry

         Zhangsan cried as soon as Lisi returned home.

Such adjuncts, however, are usually marked off from the rest of the sentence by clear pauses. In (i) **Zhangsan** is most naturally followed by a pause particle like **a**, **ma**, etc., which suggests that it is in topic position. If this is right, then the clausal adjunct in (i) may still precede an empty subject bound by the topic. In this case, the matrix subject position still may not c-command the subject of the adjunct clause.

¹⁶ Two technical problems arise under this assumption. First, the NP → S̄ rule goes against basic principles of the X-bar theory. This problem can be avoided by assuming the rule NP → it S̄, as evidenced in *I will see to it that they arrive in time*. The second problem has to do with how to allow long-distance extraction from structures of NP-complementation in apparent violation of Subjacency. A solution is to adopt Chomsky's (1973) notion of "L-contain" and exclude NP from being a bounding node when it immediately contains S̄ but no other lexical material.

¹⁷ It has sometimes been assumed that the PRO subjects of gerunds are never subject to grammatical control (cf. Mohanan (1983)). This seems to be incorrect in view of examples like (54b) or (i) below:

(i)   John still remembers |PRO meeting her on Mass Ave|.

¹⁸ The PRO theorem has been assumed to exclude PRO from the subject position of an NP and the object position of an NP with no subject:

(i)   *PRO pictures of the building

(ii)   *pictures (of) PRO

The control theory proposed here does not exclude these NPs as ill-formed, but simply says that the PRO is free if the NPs are in subject position (where it has no control domain), but controlled if the NPs are in postverbal position (where it has a control domain). However, there may be other reasons why PRO is excluded from (i) and (ii). Since nouns, unlike verbs, do not require subjects or objects as a lexical property, it may be that PRO may appear only where it is required by the Theta Criterion and the

Projection Principle. If the ill-formedness of (i) and (ii) has an independent explanation, then there is no need to maintain the PRO theorem.

[19] Chomsky (1982) notes that lexical categories lack pronominal anaphors, and attributes this to the fact that lexical pronominal anaphors would violate the Case filter, given that they are ungoverned (like PRO) and that Case is assigned under government. However, his explanation is incomplete, since he also allows certain lexical subjects to be Case marked without government, i.e. the subject of a gerund. One still needs to explain why lexical pronominal anaphors cannot be found in the subject position of gerunds. It may be that the lack of lexical anaphors is due to a universal redundancy rule: if |+anaphor| then |−pronominal|, from which it follows that there are no empty pronominal anaphors, empty or lexical.

[20] The notions 'governing category' and 'domain governing category' have been rephrased in (58)—(59) for easy comparison.

[21] There is another potential argument against the generalized binding approach that has to do with the subject-orientation of the reflexive ziji in Chinese. It has been well known that the antecedent of ziji must be a subject, though the same requirement does not hold of the English reflexive:

(i)   Zhangsan$_i$ gen Lisi$_j$ taolun ziji$_{i, *j}$.

(ii)   John talked to Bill about himself.

Based on contrasts like this, Mohanan (1983, 189) has proposed that condition A of the Binding Theory be parameterized as (iii) (irrelevant details omitted):

(iii)   An anaphor is bound (by a subject) in its governing category.

If this is correct, then Manzini's generalized binding theory, according to which PRO is an anaphor, would predict that a PRO in Chinese must also be subject-oriented. This prediction is false, as (iv)—(v) show that PRO in Chinese may be bound by an object as well as a subject, much as in English:

(iv)   Zhangsan$_i$ shefa |PRO$_i$ lai|.
              Zhangsan try   come
              Zhangsan tried to come.

(v)   Zhangsan bi   Lisi$_i$ |PRO$_i$ lai|.
              Zhangsan force Lisi   come
              Zhangsan forced Lisi to come.

The absence of subject-orientation in the reference of PRO thus argues against the generalized binding theory. (In fact, the reference of *pro* in Chinese is not subject-oriented either, and this fact also argues against the theory of Battistella (1985).)

Of course, the validity of this remark depends on the correctness of taking subject-orientation as a parameter of condition A, as in (iii). There is, in fact, some doubt that Mohanan's formulation is correct. Tang (1985) has argued that the subject-orientation should be taken as a property associated with the |+reflexive| feature of ziji, and not as a property of its |+anaphor| feature. In Japanese, furthermore, there is some indication that subject-orientation is a property of the element zibun, and not the feature |+anaphor|. As indicated by Reiko Mazuka (personal communication), Japanese has three anaphors: zibun, zibunzisin and karezisin, the last two of which are bound in their governing categories, but the first need not. Of these, the first two are subject-oriented, but the last is not. This indicates that condition A should not be parameterized for subject-orientation. If Tang is correct, then the above remark becomes irrelevant, and the facts indicated in (i)—(ii) and (iv)—(v) do not constitute any argument either for or against Manzini's or Battistella's theory.

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