The Hidden Subject of the noun phrase

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0   Introduction

Chomsky (1986) brings to our attention two rather peculiar sentences of English:

(1) a. John heard stories about him
    b. John told stories about him

It is to be noted that in (1a) the pronominal can refer to the matrix subject, while in (1b) this interpretation is ruled out. This is peculiar as, according to principle B of the binding theory, a pronominal should be free in its governing category and (1) suggests therefore that, in these two superficially alike sentences, there is a governing category excluding the subject (or a reflex of it) in the first, but not in the second. To account for this, Chomsky claims that the object NP of (1a) contains a 'Hidden Subject' with a reference distinct from the matrix subject, whilst that of (1b) has a Hidden Subject which is coreferential with the matrix subject.[1] Thus, the presence of the Hidden Subject defines the NP as the governing category for the pronominal,[2] yet in (1b) reference to the matrix subject by the pronominal is still out because this entails coreference with the Hidden Subject within the governing category, in violation of principle B:

(2) a. John$_i$ heard [$_{NP}$ HS$_j$ stories about him$_i$]
    b. *John$_i$ told [$_{NP}$ HS$_i$ stories about him$_i$]

In support of this analysis, Chomsky points to the interpretations of these constructions: with *hear stories* ... the possessor of the stories is normally taken as distinct from the hearer (we tend to hear other people's stories, not our own), whereas with *tell stories* ... the possessor of the stories is normally the teller (we tell our own stories).[3] Of course, this is exactly what needs to be claimed in order to get the binding facts right: the Hidden Subject, taken as the possessor of the NP, of the *story* must be referentially distinct from the 'hearer' but should be identical with the 'teller'.

This paper concerns Hidden Subjects inside noun phrases and their status in the grammar. Ultimately we will provide the outlines of a theory in

which Hidden Subjects play no syntactic part, arguing that on the whole the phenomena which putatively concern them are better seen as pragmatic in nature, rather than grammatical. We argue for this position in the following way. First we consider arguments to favour the assumption of Hidden Subjects, concluding that on the basis of well established and independently motivated principles, mainly concerning control and binding theories, there is good reason to believe in Hidden Subjects. Second, we demonstrate that there are strong reasons to reject the assumption of Hidden Subjects as basically untenable. On the basis of this contradiction we argue that the evidence proposed in favour or Hidden Subjects is questionable and misleading. It is pointed out that much of this evidence is also used to support the assumption of the 'Hidden Subject' of control structures, PRO, and thus, there may be reason to question the existence of this element too. To add to these problems, we point out that, as has been argued previously, there are many things that Hidden Subjects share in common with PRO. Yet there are also differences between the two notions which are made impossible to reconcile if we conflate them into a single category. We will point out that all of these problems arise directly out of the assumption of inviolable rigid constraints in the grammar and that if we reject this notion and follow an Optimality Theoretic approach a solution can be found in which the notion of a Hidden Subject is jettisoned from the grammar along with PRO. Control facts can be differentiated from those involving 'Hidden Subjects' in terms of the semantic processes that underlie the former but which have no role in the latter. We sketch the outlines of a theory within which this view can be fully exploited.

1   Support for Hidden Subjects

In this section we review three pieces of evidence in favour of the supposition of Hidden Subjects. These concern the control of the PRO subject of purposive clauses inside NPs, the ability of some anaphors within NPs to refer backwards and the ability of anaphors within NPs to take split antecedents.

1.1   Control

Roeper (1984) noted that purposive clauses inside NPs can appear with a PRO subject without there being any overt element to control it. However, as the interpretation of PRO makes clear, the controller is the Hidden Subject of the NP:

(3) the destruction of the house [PRO to collect the insurance] was highly immoral

Clearly the ones who will collect the insurance are the ones that destroyed the house.

Note that the behaviour of the PRO subject of the purpose clause is very strange unless we assume that there is a grammatically present element within the NP acting as the controller: a non-controlled PRO normally receives arbitrary reference, as shown in (4), where PRO_{arb} acts as the antecedent of the arbitrary anaphor *oneself*:

(4) a. [PRO_{arb} to collect the insurance for oneself] would be highly immoral
    b. it would be highly immoral [PRO_{arb} to collect the insurance for oneself]

But the PRO subject of a purpose clause inside an NP does not always have arbitrary reference, as shown in (5):

(5) a. the destruction of the house [PRO to collect the insurance for oneself] would be highly immoral
    b.*the judge condemned the destruction of the house [PRO to collect the insurance for oneself]

If (5a) really were a case of non-control, it would be difficult to account for why arbitrary reference is not possible in (5b). From a structural point of view, PRO is in exactly the same position within the NP in both cases: the fact that the NP itself is a subject in (5a) and an object in (5b) should be inconsequential for the interpretation of PRO. This is true of the normal context of arbitrary control: when the clause containing PRO is a domain of arbitrary control, it does not matter whether that clause is a subject or object, PRO still gets arbitrary reference:

(6) a. that [it would be wrong [PRO to leave]] is obvious
    b. I believe that [it would be wrong [PRO to leave]]

The assumption of a Hidden Subject within the NP, however, offers a solution to these problems, especially if, as has been argued (see Giorgi & Longobardi 1991), the identity of the Hidden Subject is PRO:

(7) a. [HS_{arb} the destruction of the house [PRO_{arb} to collect the insurance for oneself]] would be highly immoral

b. *the judge condemned [HS$_i$ the destruction of the house [PRO$_{arb}$ to collect the insurance for oneself]][4]

Note that the Hidden Subject has an arbitrary reading in exactly the same context as does PRO: when it is directly contained within a subject, but not within a complement.[5] Thus, assuming the Hidden Subject to be PRO and therefore subject to the principles of control theory, we account for the referential properties of the PRO subject of the purpose clause under the assumption that this is controlled by the Hidden Subject.

1.2   Backward Anaphora

A second phenomenon is also accounted for if we assume a Hidden Subject inside the noun phrase. Normally it is not possible for an anaphor to refer backwards, due to the c-command restriction placed on its antecedent:[6]

(8) *himself was pleased by Bill's pictures of him

Here the anaphor *himself* cannot take *him* as its antecedent because the correct structural relationship does not hold between them. However, Manzini (1983) first pointed out that there are some curious exceptions to this observation:

(9) the pictures of himself in the newspapers upset the invisible man

Manzini's account of this phenomenon was to assume that in this structural configuration (inside a subject noun phrase) the anaphor lacks a binding domain and hence can (co)refer freely. Unfortunately, this does not accord fully with the data either, as there **are** structural restrictions on the reference of the anaphor, even in these cases:

(10) a. *the pictures of himself in the newspapers worried the spy's mother
     b. *the president's wife believed that the rumours about himself were
         untrue

Clearly, the anaphor is not totally free to corefer in these contexts, contrary to Manzini's claim. In particular, the anaphor cannot refer 'backwards' too far into the structure and moreover it cannot refer forwards to a non-c-commanding element.

Manzini (1983), however, also pointed out phenomena that might help to solve this puzzle, though she did not recognise it as such at the time. Apparently, when PRO is in a possible non-control situation, it also

can refer backwards, with exactly the same restrictions as we have seen for the backward reference of anaphors:[7]

(11) a. PRO to love oneself is difficult for an actor
    b. PRO to love himself is difficult for John
    c.*PRO to love himself is difficult for John's wife
    d.*the ex-prime minister's husband believes that PRO to love herself
       is impossible

On the assumption that the Hidden Subject is PRO, we therefore have a partial account for the strange behaviour of the anaphors in examples like (9). The anaphor inside the NP is referentially dependent on the Hidden Subject, which itself has the capability for backward reference (subject to restrictions) in this syntactic context:

(12) HS the pictures of himself in the newspaper upset the invisible man

     Further support for this can be gained from the observation that in exactly the same context the generic anaphor *oneself* can be used:

(13) HS pictures of oneself can be upsetting for an actor

These anaphors, like all others, must have an antecedent and therefore unless we assume that the Hidden Subject of the NP is this antecedent, the grammaticality of (13) will be difficult to account for.[8]

1.3 Split Antecedents

A well known restriction on the possible reference of anaphors is that they cannot take split antecedents, as seen in the following:

(14) a.*John asked Mary about themselves
    b.*Freud revealed Adler to themselves

A curious exception to this, however, shows itself when the anaphor is inside an noun phrase:

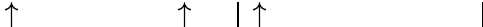(15) John showed Mary a picture of themselves

     Again, the Hidden Subject can be used to account for this oddity. Other elements can take split antecedents, and can mediate between split antecedents and an anaphor:

(16) a. John told Bill that they were no longer partners
     b. John told Mandy that they were not to speak to each other in public

Also, it is possible for PRO to act as a mediator:[9]

(17) John helped Bill PRO to prepare dinner for themselves

If the Hidden Subject is PRO, we would expect that it too can act as a mediator and hence we can account for (15):[10]

(18) John showed Mary HS a picture of themselves

1.4 Half time Result

From the data we have so far reviewed, there would seem to be ample evidence of the existence of Hidden Subjects. The assumption of such an element inside the NP enables us to account for the otherwise irregular behaviour of: pronominals within certain contexts ('tell/hear stories'); the control subject of purpose clauses inside NPs; anaphors that appear to refer backwards and anaphors that appear to take split antecedents. All of these observations are mysterious unless we propose an element controlling the reference of pronominals, anaphors and PRO inside the NP. As there is no overt element to act as this controller, we are forced to accept that the controller is covert and that this element is the Hidden Subject.

In the next section we raise a number of problems for the assumption of Hidden Subjects, which are even more problematic given the conclusions of the present section.

2 Problems for Hidden Subjects

In this section we will look at two problems concerning the notion of a Hidden Subject. The first concerns the identity of the Hidden Subject. Although there are arguments to suggests that Hidden Subjects should be identified as PRO, there are a number of substantial differences between PRO and Hidden Subjects. These observations lead to one of two unwelcome conclusions: either Hidden Subjects are not PRO but some as yet unrecognised empty category; or Hidden Subjects are PRO and the theory of control is more complicated than has previously been recognised. The first conclusion is unwelcome because it adds an extra complication to the grammar that does not fit well into the standard theory of empty

categories and also because it fails to account for the similarities between Hidden Subjects and PRO. The second conclusion is unwelcome because control theory is already recognised to be complicated beyond our current abilities to characterise it.

Admittedly, the above observations do not amount to a knockdown argument against the assumption of the Hidden Subject, they just make the situation uncomfortable. The second problem we discuss in this section, however, raises serious doubts about the assumption of this element. We demonstrate that the usual assumption that the Hidden Subject acts as the possessor element inside the NP cannot be upheld as it is possible to get the possessive interpretation when a Hidden Subject is not present and to have no possessive interpretation associated with a Hidden Subject that is present. Thus the presence of the Hidden Subject and the interpretation of possession are completely separate phenomena. This raises the fundamental question of what we are to take the Hidden Subject to be and the answer seems to be that it is the element in the NP that makes the control and binding theories work. Obviously such a circular position cannot be maintained, yet if there is no other motivation for the assumption of Hidden Subjects other than the data that their assumption explains, the argument remains circular.

2.1   The Identity of the Hidden Subject

Throughout the previous section we have pointed out certain similarities in the behaviour of Hidden Subjects inside NPs and that of PRO. These similarities are strong enough to encourage some (*e.g.,* Giorgi & Longobardi 1991) to claim that Hidden Subjects are PRO. However, before going on to demonstrate that this assumption is not so straightforward, it would be wise to first satisfy ourselves that a simpler analysis does not exist if we were to take the Hidden Subjects to be an instantiation of some other empty category.

It is fairly easy to discount the possibility that the Hidden Subject is NP-trace or *pro*. NP-traces are the result of a movement to an argument position. As nothing has moved out of the NP to an argument position in any of the examples we have seen, we can safely conclude that the Hidden Subject is not an NP-trace. Furthermore, NP-traces are anaphors and hence must be bound within a certain domain. We have also seen that Hidden Subjects can be free in some contexts and hence cannot be taken to be pure anaphors. As for *pro,* the distribution of this element is determined by the appearance of a rich agreement system. *pro* can appear as subject

of NP, when there is agreement between the possessor and the head noun, as in languages such as Hungarian:

(19) János elment   [az *pro* autójával]
      J.   away-went the   car-3SG-with
      'John left in his car'

However, as English does not have any agreement between the possessor and the head noun, it is fairly clear that a *pro* subject will not be licensed in the English NP.

The third possibility is that Hidden Subjects are variables: the traces left behind by operator movement. At first we might be tempted to discount this suggestion due to the lack of any overt operator to bind such a trace. However, it might be claimed that the operator involved is itself empty, as we find in some analyses of certain relative clauses and 'tough movement' constructions. Following the suggestion of Szabolcsi (1981) that NPs have a 'COMP-like' projection above them, we might propose the following structure for the NP:

(20) $[_{CP}$ Op_i $[_{NP}$ t_i stories about him]]

If this analysis were correct, however, we would expect the operator to interfere with other A-bar movements due to Relativised Minimality conditions (Rizzi 1990). The following suggest that this is not the case and hence that the variable analysis of Hidden Subjects cannot be maintained:

(21) where did John hear stories about him from

(21) is ambiguous, with the PP *from where* being attachable to the VP, in which case the question concerns the source from which the stories were heard, or attachable to the NP, in which case the question concerns the place of origin of the stories themselves. The two different interpretations can be more clearly seen in terms of their possible responses:

(22) a. John heard stories about him from the Vicar
      b. John heard stories about him from Africa

Now, given the interpretation with *him* coreferential with *John,* hence requiring the Hidden Subject, we can see that the Hidden Subject cannot be represented as in (20), as (21) would be unambiguous with this reading: *i.e.,* wh-movement from out of the NP should be blocked. The fact that (21) remains ambiguous, even in the presence of a Hidden Subject, can

therefore be taken as evidence that the Hidden Subject is not a variable bound by an empty operator.

Having discounted the possibility that the Hidden Subject is any other type of empty element, we are left with the remaining possibility that it is PRO. Let us briefly review the evidence in favour of this assumption. The first piece of evidence that the Hidden Subject is PRO comes from observations concerning the parity of the situations in which PRO and the Hidden Subject can be given an arbitrary reference. Both PRO and Hidden Subjects can take arbitrary reference when they are immediately contained in the subject, but not the complement of a clause:

(23) a. he tried PRO to frighten himself/*oneself
     b. PRO to frighten *himself/oneself is impossible

(24) a. John told HS stories about himself/*oneself
     b. HS stories about *himself/oneself are often disturbing

Secondly, we have seen that PRO and Hidden Subjects share certain properties in common which differentiates them from other anaphoric elements: the ability to refer backwards (under certain structural restrictions) and the ability to take split antecedents. Finally, PRO and Hidden Subjects share similar restrictions on their distribution: PRO can only appear as the subject of a non-finite clause and Hidden Subjects can only appear as the subject of an NP. The fact that PRO has been assumed to appear in the subject of certain nominals (*e.g.,* gerunds) demonstrates that the subject of the NP is a position in which PRO may appear. Hence there appear to be many reasons to believe that the Hidden Subject is PRO.

However, despite these similarities, there are a number of differences between PRO and the Hidden Subject. One difference between them concerns the contexts within which non-control is determined. For PRO, this is entirely structurally determined and corresponds to the contexts which determine the possibilities for arbitrary reference, as discussed above.[11] However, a non-controlled Hidden Subject is possible in other contexts, as the first example of this paper demonstrates:

(25) John heard HS stories about him

Recall that the explanation for why the pronominal can refer to *John* is that the Hidden Subject is to be interpreted as disjoint in reference from the matrix subject. Clearly, this phenomenon is lexically determined: it is to do with properties of the governing verb. With *tell* the Hidden Subject is controlled and with *hear* the Hidden Subject is not controlled. Thus, there

are two ways in which the Hidden Subject differs from PRO demonstrated here. First the hidden subject is allowed to be non-controlled in a syntactic context where it would be impossible for PRO to be non-controlled and secondly the relevant factor determining whether or not the Hidden Subject can be non-control is lexical, not structural.

A further difference between Hidden Subjects and PRO is that the interpretation of the non-control Hidden Subject in (25) is not the same as an ordinary non-control PRO. When PRO is non-controlled, it has arbitrary reference. But the Hidden Subject in (25) does not have arbitrary reference, as demonstrated by (26):

(26) *John heard stories about oneself

Whatever the interpretation of this Hidden Subject, it is not one that there is a corresponding reflexive pronoun for, as the only possible reflexive in this position is one which is bound by the matrix subject:[12]

(27) a. John heard stories about himself
    b. Mary heard stories about herself
    c. *John heard stories about myself/yourself/herself/itself/ourselves/
        yourselves/themselves

Thus, the interpretation of the Hidden Subject in this case is not describable solely in terms of the ϕ-features that are normally assumed to constitute PRO. Let us refer to this interpretation as 'unspecified', as the stories referred to in (26) belong to some unspecified person. This clearly creates a problem for the identification of Hidden Subjects as PRO: if Hidden Subjects are PRO, this empty element comes in three types—controlled, arbitrary and unspecified. Only the first two of these can be expressed with the normal set of ϕ-features and the third can only be expressed by a Hidden Subject. The indications are therefore that Hidden Subjects are not to be equated with PRO.

One more difference between Hidden Subjects and PRO can be mentioned. When PRO is controlled, depending on the governing verb, it will either be controlled by the agent or the patient:

(28) a. I asked Bill [PRO to leave]
    b. I promised Bill [PRO to leave]

However, there are verbs which are object control when PRO is involved, but subject control when a Hidden Subject is involved:

(29) a. John$_i$ told Bill$_j$ [PRO$_j$ to leave]
     b. John$_i$ told Bill$_j$ [HS$_i$ stories about him]

From a syntactic point of view, it is not obvious why this should be the case, if PRO and Hidden Subjects are one and the same element. From a pragmatic point of view, however, there would seem to be a clear account of this difference: when we tell someone X and X is a command, and further it is not stated who should carry out what is commanded, the most pragmatically relevant choice it that the intended subject of the command is the person addressed, not the giver of the command (why would you tell someone a command that you yourself have to carry out?). On the other hand, when X is a story and it is not explicitly stated whose story it is, the most pragmatically relevant assumption would be that the story is that of the teller, not the tellee (why would you tell someone their own story which they obviously already know?). These observations are worrying as it is normally assumed that such pragmatic considerations do not determine syntactic facts and that reference of PRO is supposed to be grammatically determined. Note, however, if we do not conflate Hidden Subjects and PRO, the problem for control theory goes away: of course the interpretation of (29a) is still in line with the most pragmatically relevant interpretation, but this fact alone does not mean that the reference of PRO is determined by pragmatics. It is only when we note differences in the interpretation of elements for which there is no obvious syntactic account that the pragmatic position is strengthened.

     Thus, we see that the case for treating Hidden Subjects as PRO is not as straightforward as might have been believed. One response to this situation might be to reject the assumption that Hidden Subjects are PRO and to assume that they are some as yet undiscovered empty category. Yet such a response is not without its problems. First it obviously complicates the grammar, requiring a theory of Hidden Subjects parallel to that of control theory. Furthermore, such an extra empty category does not fit well with the normal characterisation of empty categories in terms of the features [±anaphor], [±pronominal]. On top of this, such an assumption makes it difficult to capture the fact that Hidden Subjects and PRO obviously do share certain properties in common. Another possible response would be to try to maintain the claim that PRO and Hidden Subjects are one and the same thing by complicating control theory. But this would not amount to much of a response given that control theory as it stands is not particularly well developed and without a specific proposal, such a position is hard to evaluate. The fact that control theory is not well understood

coupled with the pressure to complicate it further by taking into consideration the behaviour of Hidden Subjects might well be indicative that the whole approach needs re-evaluating. We will discuss the consequences of these observations for the theory of control in the last section, but for now we merely state that they make the assumption of the Hidden Subject more problematic than we would have liked.

2.2   The Hidden Subject as Possessor

In this section of the paper we examine some of the claims that we have introduced concerning the interpretation of the Hidden Subject in the light of claims about when it is and isn't present.

Returning to Chomsky's original observations once more:

(30) a. John told [HS stories about him]
b. John heard [HS stories about him]

We account for the referential behaviour of the pronominal by supposing that the Hidden Subject is coreferential with the clausal subject in (30a), but not in (30b). Now, consider the following:

(31) a. John told stories about himself
b. John heard stories about himself

As we noted in note 12, to account for the grammaticality of (31b), Chomsky was forced to accept that the Hidden Subject is optional inside the NP. If this were not the case, the anaphor would have to be bound by the Hidden Subject as this element would define the binding domain for the reflexive. Given that the Hidden Subject is distinct in reference from the matrix subject, for the reflexive to be coreferential with the matrix subject, it must be directly bound by this element. Thus the Hidden Subject must be absent to allow the NP to be discounted as the relevant binding domain.[13]

But, now consider the question of who the stories belong to in (31): the answer seems to be the same as with (30)! But in (30) the possessor is represented by the Hidden Subject, which is absent in (31). There are two possible responses to this observation. Either we can claim that there is a Hidden Subject in (31) and that the reference of this element is not strictly lexically determined: it can alternate depending on the requirements of a pronoun within the NP. Or we can claim that there are two ways of getting the possessive interpretation: one requiring the presence of a Hidden Subject and one that does not require a Hidden Subject. The first of these

possibilities is obviously inadequate. Apart from the fact that it makes the whole argument so circular it becomes vacuous, it does not even make the right predictions about the interpretation of the possessor in (31b). If the Hidden Subject were present here, and controlled by the matrix subject, we would expect a distinct difference in the interpretations of who the stories belong to depending on whether the individual that the stories were about was represented as a pronominal or an anaphor. It would be quite bizarre if this were to be the case, and in fact, as (32) shows, it is not:

(32) a. John heard stories about him
     b. John heard stories about himself

Clearly, although (32a) must be interpreted with the possessor of the stories with disjoint reference to *John,* (32b) does not have to be interpreted with the possessor of the stories being *John.* Thus we are forced to accept the conclusion that the Hidden Subject is not present in (32b) and hence that any interpretation of possession attributed to this structure must arise independently of the notion of the Hidden Subject.

Above we used 'backward anaphora' and 'split antecedent' phenomena to argue in favour of the postulation of Hidden Subjects. Consider these cases again, paying attention to who is interpreted as the possessor:

(33) a. [HS pictures of themselves] would please the boys
     b. John showed Mary [HS pictures of themselves]

Clearly what we expect is that the Hidden Subject, being the antecedent for the anaphors in these cases, should pick out quite definitely who the possessors are: *the boys* in (33a) and *John* and *Mary* in (33b). However, there is a clear difference in the interpretation of these sentences in comparison with those where the possessor element is overt:

(34) a. [their pictures of themselves] would please the boys
     b. John showed Mary [their pictures of themselves]

In (33), despite the fact that it is obvious what the reference of the Hidden Subject should be, there is no compulsion to interpret the possessor of the NP as identical with the Hidden Subject. On the contrary, in (34) when the reflexive refers to *the boys* and *John* and *Mary,* respectively, then the possessors are interpreted as referring to these elements.

These observations present exactly the opposite picture to that which we saw above. Previously we noted that we can have a possessive interpretation in the absence of the Hidden Subject. These examples show

that in the presence of the Hidden Subject, this element does not have to be taken to be the possessor. Clearly then, the notion of the Hidden Subject and that of the possessor are completely distinct, though they sometimes coincide.

But if the Hidden Subject is not the possessor inside the NP the question that needs to be addressed is: what is it? Unfortunately, for examples such as (33) above, the only function that the Hidden Subject has is as an element to enable the reflexive to have the interpretation that it does. But this kind of circularity is not acceptable: if the only motivation for the assumption of the Hidden Subject is the data that the assumption of the Hidden Subject allows us to account for, then this rather undermines the whole argument.

3 Subjects and Optimality Theory

We seem to have reached an impasse: on the one hand there are data which are difficult to account for without the assumption of a Hidden Subject and yet the assumption of the Hidden Subject is problematic and in the final analysis only motivated by the data that it is supposed to account for. Without independent motivation it is not obvious that the assumption of an empty element inside the NP can be maintained.

In fact, the problems raised by this discussion go further than just the assumption of the Hidden Subject. Most of the arguments used to establish the Hidden Subject can be used as justification for the control subject PRO. If these arguments have questionable outcomes in the case of Hidden Subjects, we might start to doubt their outcome in the case of PRO. Furthermore, as we have seen, 'Hidden Subjects' seem to have a number of properties in common with PRO and if Hidden Subjects are questionable syntactic elements, it might be surprising to find an actual syntactic element with the same properties. In short, if we are led to question the existence of Hidden Subjects and look to find other explanations for their effects, the possibility is at least raised that the same treatment should be given to PRO.

At this point, it might be useful to briefly review some of the arguments that have been proposed to support the assumption of PRO. One such argument has to do with the Extended Projection Principle (EPP). If all clauses must have subjects, and certain infinitival clauses appear without an overt subject, it follows that there must be a non-overt subject of these clauses. Another argument comes from the Theta Criterion: if all predicates must assign their theta-roles to unique elements and there is no

overt external argument within certain infinitival clauses, it follows that there must be a covert subject to receive the external theta-role. Finally, another argument comes from certain agreement/anaphora phenomena. As is known, certain elements, such as reflexive pronouns, must refer to/agree with some other clause-mate element. The supposition of a covert subject is then forced to account for the grammaticality of the following:

(35) a. $John_i$ tried [PRO_i to better $himself_i$]
      b. [PRO_{arb} to like oneself] is easy for royalty

However, arguments of the latter kind are exactly the sort we have shown to lead to dubious conclusions in the case of Hidden Subjects and hence we should be wary of them in this case too. Arguments of the second kind are not entirely conclusive given the debate concerning treatment of secondary predication: Williams (1980, 1983, 1992) has argued strongly that secondary predicates are related to the elements they are predicated of by theta-role assignment and thus that the Theta Criterion is overstated in its original form. In particular, it appears that arguments can bear thematic roles from a number of predicates. In principle, a similar treatment is possible for all control structures, as indeed has been proposed in numerous places (see Klein & Sag 1985 for example).

We are left, then, with the first argument from the EPP. This argument is based on the view that if there is evidence of a constraint in operation, that constraint will apply in all cases. Recently this view of constraints has been challenged. Optimality Theory proposes that constraints should be given a different characterisation. In particular, constraints are seen to be violable, given the right set of conditions. What constitutes 'the right set of conditions' is determined by a ranking of constraints: the right set of conditions to allow a constraint to be violated is that adherence to the constraint entails the violation of a more highly ranked constraint. Consider then, the EPP argument for the existence of PRO. Certainly there would seem to be a constraint on the obligatory appearance of subjects in English and so we would want to keep such a constraint as part of our grammar. However, there are other constraints on the distribution of NPs that sometimes conflict with the EPP. For example, the Case Filter requires that all NPs be Case marked. Now, it is well known that certain subject positions are not Case marked and thus for these there is a conflict between the appearance of a subject, as recommended by the EPP, and the non-appearance of an NP in such a position, as recommended by the Case Filter. Suppose we were to include these constraints within an Optimality Theoretic framework with the Case Filter ranked higher than the EPP. In

the cases of conflict, the Case Filter would win out and the result would be that the more optimal structure is a clause without a subject. This is represented in the following table:[14]

(36)

	Case Filter	EPP
John tried [NP to leave]	*!	(✔)
☞ John tried [to leave]	✔	(*)

Of course, the EPP will play a role in determining the grammaticality of structures, but only in cases where the Case filter is satisfied. For example, the EPP will force the presence of a pleonastic subject of a finite clause with a predicate which does not assign an external semantic role:

(37)

	Case Filter	EPP
seems John left	✔	*!
☞ it seems John left	✔	✔

By the same reasoning, we are not going to get 'control structures', *i.e.*, clauses lacking a subject, when the Case Filter is potentially satisfiable:

(38)

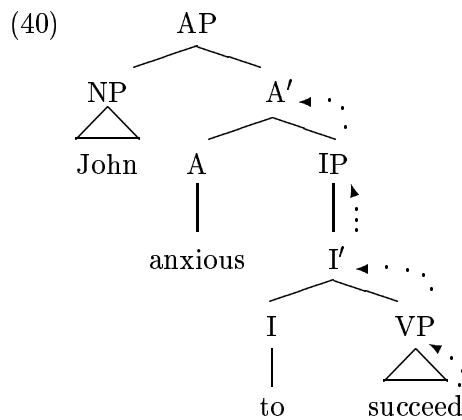|	Case Filter	EPP
John thinks [left]	✔	*!
☞ John thinks [he left]	✔	✔

Thus, there is perfectly reasonable theory of the syntax of these structures which does not necessitate a covert subject in such control structures.[15]

We are left with the rather more difficult semantic problem of the interpretation of subjectless clauses. I suppose what we would want to say is that Control theory is the result of what the semantics does when presented with optimal structures which lack subjects. Here I will sketch the outlines of such a theory. First consider cases of actual control (*i.e.*, cases with a non-arbitrary reading) as in (39):

(39) John is anxious [to succeed]

The embedded predicate obviously has a thematic role to assign and the interpretation suggests that it assigns this to the matrix subject. Suppose that theta-role assignment takes place in the semantics, *i.e.*, after the optimal candidate has been selected. Normally, theta-role assignment proceeds

as usually assumed, under strict locality conditions. However, in cases such a (39) there is no element to assign the external theta-role of the embedded predicate to. In effect, this causes the whole clause to act like a predicate, having an external theta-role to assign to some argument. The mechanism for this we can assume to be identical to normal external theta role assignment: internal theta-roles are assigned directly to sisters of the head, but external theta-roles percolate up to the element which is sister to the external argument.[16] Suppose that if there is no element to assign the external theta-role to, it keeps on percolating until it reaches the sister node of an argument to which it can then be assigned. This process is represented in the following diagram, where the dotted lines represent percolation:

(40)

```
                    AP
                  ⁄    ⁀
              NP           A′◂··.
             ╱◸╲         ╱      ⁀  ⋮
           John      A        IP
                     │        │▸
                     │        │⋮
                  anxious    I′◂···.
                          ╱      ⁀  ⋮
                        I          VP
                        │        ╱◸╲▾·.
                        │       ╱    ╲  ⋮
                        to    succeed
```

Note that such 'long distance' percolation will only be licensed in the absence of a subject, and an absent subject is only allowed in cases where the Case Filter rules that there can be no NP. Thus we will not overgenerate under these assumptions by allowing any clause to be subjectless and external theta-roles to be assigned to any subject: theta-roles will be discharged as locally as possible.

This leaves us with the problem of how to account for the difference between subject and object control cases. This is problematic anyway given that it is not only the identity of the governing predicate that determines where the theta-role is discharged, but also the semantics of the control structure itself, as the well known examples demonstrate:

(41) a. John promised Mary [to leave]
     b. John persuaded Mary [to leave]
     c. John promised Mary [to be allowed to leave]

All that we need to say is that the notion of theta-role percolation allows the theta-role to be discharged on either the subject or the object and that which of these is selected is a complex matter which is not well understood.[17] The reason why percolation allows the theta-role to be discharged on either the subject or the object is also a muddy issue, clouded by the fact that the structure of multiple complement constructions is a contentious issue. In this brief sketch, I will not attempt to solve these problems.

Arbitrary reference is the result of there not being an element for the theta-role to be discharged on. Again, the syntax will provide the semantics with a structure with a missing subject and the semantics has to sort out the theta assignment arrangements. If the subjectless clause is a subject itself, the process of percolation will not provide an argument to receive the theta-role. In this case the semantics is forced to saturate the theta-role in some other way. Rizzi (1986) points out that one way to saturate a theta-role in the lexicon is to assign it arbitrary reference. If this process can happen in the semantics as well, we have the beginnings of an account for arbitrary control structures. Again, there are problematic cases which need a more closer analysis, such as the arbitrary reference assigned in the following cases:

(42) a. John asked how [to feed oneself correctly]
     b. John is easy [to please]

Again, I will not attempt a solution to these problems here, but obviously the solution lies in a more specified theory of the notion of theta-role percolation. In these cases, the theta-role must fail to percolate higher than the subjectless clause and hence the arbitrary reference is forced.

This rather brief and largely unsatisfactory account of control phenomena at least provides us with a view on the notion of the Hidden Subject. The theory of control sketched above has two parts: one syntactic and one semantic. The syntactic part simply determines the structures where subjects are allowed to be missing, the semantic part deals with how to assign theta-roles given an absent subject. Missing subjects are allowed only to satisfy the Case Filter, otherwise the EPP must also be adhered to.

However, the EPP, presumably, does not extend to NPs and thus the possessor element inside the NP will be entirely optional. Thus the syntactic part of the analysis is different for cases of control and of Hidden Subjects. The semantic part is also different as if the Hidden Subject has a semantic role at all it is that of possessor. If we take the line that possession

is not a theta relationship as proposed by Williams (1980) and Pollock (1989), then the notion of theta percolation will also not play a role in the structures we are considering. In fact, it is doubtful that any semantic process on a par with theta percolation is involved in these structures and as noted above the identification of a possessor in the absence of an overt genitive element is more pragmatic than semantic. In other words, when presented with a structure such as (43) and asked: who is the possessor of the stories?, we will tend to opt for the most pragmatically relevant participant, *i.e.*, the teller:

(43) John told [some stories]

This accounts for why there is no arbitrary reference interpretation with such structures: arbitrary reference is assigned to saturate a theta-role which would otherwise not be assigned. As there is no theta-role going spare in (43), there is no assignment of arbitrary reference to it.

This line of reasoning suggests that there is no such thing as a Hidden Subject. We are therefore confronted with the 'evidence' which support the assumption of such elements. Some of this concerns the interpretation of reflexive pronouns in cases where there seems to be no antecedent:

(44) stories about oneself can be embarrassing

However, this kind of evidence is once again based on the assumption that constraints are inviolable in all circumstances: the assumption is that as reflexives generally need an antecedent, the fact that there is no overt antecedent in (44) leads to the conclusion that there must be a covert one. But once we embrace Optimality Theory, these sorts of arguments lose their force: there may well be a constraint, the effect of which is to make anaphors have antecedents, however this constraint may be violable under the right set of conditions. Note, that if our theory of control is on the right track, we are forced into taking an Optimality Theoretic stance on the binding theory as we get the same non-bound anaphors in control structures:

(45) to shoot oneself is never a good idea

It is interesting to note here that the only unbound anaphor we get in these contexts is the generic *oneself*. Without developing the Optimality Theoretic account of binding that is needed, we might speculate that assignment of generic reference is once again the semantics' response to being presented

with an unbound anaphor in much the same way that it assigns arbitrary reference to an undischarged theta-role.

The other type of evidence in support of Hidden Subjects concerns control facts, as in:

(46) the building of a tower to study the moon was one of his better ideas

At first, these sorts of example might appear to cause some problems for our position. We have claimed that control is by and large a semantic phenomenon concerning either the percolation of theta-roles or the assignment of an arbitrary reference to an undischarged theta-role and, on the other hand, that 'Hidden Subject' phenomena are by and large pragmatic. In (46) we seem to have the semantic being controlled by the pragmatic: the theta-role of the subjectless clause *to study the moon* assigns its external theta-role to the Hidden Subject of the NP. However, contrary to appearances, this datum actually provides some support for our view. Note that we only ever get subjectless purpose clauses inside NPs headed by a noun which assigns an agentive role to its genitive elements, as with derived and gerundive nominals given a process reading rather than a resultative one:

(47) a. the destruction of the city to demoralise the enemy
b. the sinking of the ship to collect the insurance
c. the exploitation of the workers to make money

(48) a. *the building to study the moon
b. *the destruction to intimidate the enemy
c. *the disaster to make people donate more to charity[18]

We can account for this difference under the assumption that in (47), but not (48), there is a proper control relationship inside the NPs precisely because these are headed by nouns that assign a theta-role to the genitive element. As the genitive element is absent in these cases, our theory would predict that an arbitrary reference will be assigned to these theta-roles and it is this that controls the external theta-role of the purpose clause. In (48) however, the nouns have no external theta-role to assign hence there is nothing to control the external theta-role of the purpose clause. Once again, the picture is incomplete pending a more rigorous theory of theta-role percolation, as we still have not accounted for why it is impossible to assign an arbitrary reference to the external theta-role of a purpose clause when the head noun does not assign an external theta-role. But the important point at the moment is that these observations demonstrate that it is not

a Hidden Subject which is controlling the purpose clause, but the external theta-role of the head noun.

To summarise this section, we have claimed that there is a reasonable Optimality Theory based account of control and 'Hidden Subject' phenomena which does not make reference to empty categories. For the most part, the two things are entirely different: control is syntactically the situation where clauses are forced to be subjectless and semantically the result of this syntactic possibility; 'Hidden Subject' phenomena are basically pragmatic, the result of inferring the possessor of an NP when one is not explicitly stated on the basis of pragmatic knowledge. This accounts for the differences we have observed between the two sets of phenomena: *e.g.*, undischarged theta-roles are assigned arbitrary reference in the semantics, but uncontrolled 'Hidden Subjects' are given an unspecified reading simply because there is not enough contextual information to be able to identify the unstated possessor. The similarities between the phenomena fall out from the assumption that in both cases there is no syntactically present element and hence some other explanation must be proposed to account for the kinds of binding facts we have looked at. Again, this indicates that binding theory should be given an Optimality Theory treatment as it demonstrates that binding constraints are not inviolable, under the right set of conditions. In one case we have reviewed control and Hidden Subject phenomena are treated as the same, exactly in the case where the noun has a theta-role to assign to its subject. Here the notion of the semantic saturation of theta-roles is just as relevant in clauses and NPs and hence the claim is that they are exactly alike.

4   Conclusion

In this paper we have demonstrated that the theory that takes constraints to be inviolable and rigid runs into serious problems concerning the notion of Hidden Subjects within NPs. Most of the evidence in favour of such elements is of the form: phenomenon X cannot be accounted for unless we assume the existence of a Hidden Subject, where phenomenon X is some repercussion of a rigid constraint. However, the notion of a Hidden Subject cannot seriously be maintained given that such an element would have to be unique in the whole system (whilst at the same time sharing certain properties of PRO), not being characterisable in terms of the usual set of features which comprise other empty categories, and also often having no other role than to satisfy the very constraints that motivate its assumption. In the face of this we are forced to abandon the notion of a Hidden

Subject and as a consequence abandon the idea of inviolable constraints. Only if constraints are violable, under the right set of conditions, can we account for the data that suggested the Hidden Subject in the first place: phenomenon X is now to be seen as the violation of a constraint in order to satisfy a more highly ranked constraint.

We have, under this line of reasoning, also been led to question the normal assumptions of control theory, concluding that there is little under these assumptions to warrant the assumption of the element PRO. We have briefly and admittedly inadequately sketched a theory of control in which the syntax plays only the minor role of presenting the semantics with certain clauses which lack subjects. The semantics then has the task of deciding what to do with such structures. We have suggested that, on the whole, control theory can be subsumed under a theory of theta-role percolation, which is needed in any case to account for external theta-role assignment, albeit in a somewhat more local domain. Importantly, this allows us to treat Hidden Subject phenomena as different to control phenomena and thus account for the differences between them. Under this view, Hidden Subjects do not exist, their effects follow from the violation of other previously considered inviolable constraints and the pragmatic inferencing of a possessor when one is not explicitly mentioned.

NOTES

[1] Throughout this paper I will refer to nominal phrases as NPs. This is not to deny the DP-hypothesis as all the assumptions I make clearly fit with this hypothesis. In fact, as Hidden Subjects often appear along with an overt determiner I believe that one must adopt the DP-hypothesis if we are to provide a structural position for the Hidden Subject. However, as the issue of what the head of the nominal phrase is does not affect anything contained in this paper, I will continue with the standard terminology so as not to get embroiled in irrelevant issues. If you are so inclined, please read DP for NP.

[2] A governing category for a pronoun is defined as the smallest constituent containing the pronoun, its governor and a subject.

[3] This isn't entirely convincing as it is perfectly possible to conceptualise telling someone else's stories. However, possession is a rather vague relationship and there is, I suppose, a sense in which stories 'belong' to the teller, even if they originate with another person. Besides, these observations have a distinct smack of pragmatics about them and thus it is strange that they should play a role in determining what is normally considered to be grammatical phenomena.

[4] Note, here is an indication that things are not quite right. Assuming that the Hidden Subject is PRO and that in (7b) it is in a control context, hence it does

not have arbitrary reference, the Hidden Subject is still not controlled. We will discuss these facts in the next section.

[5] There are other circumstances when PRO can be arbitrary which seem to be irrelevant for Hidden Subjects, such as when the clause containing PRO has an operator in its CP:

(i) it is not clear [how PRO to proceed]

Given that NPs seem not to have an operator position introducing them, this kind of construction has no counterpart in the NP and hence we would not expect an arbitrary Hidden Subject corresponding to this arbitrary PRO.

[6] Principle A of the binding theory states that an anaphor must be bound in its governing category. Being bound entails both coindexation and c-command. The antecedent of the anaphor must c-command it.

[7] Of course, Manzini (1983) treats PRO as an anaphor and on this assumption predicts that the two should have the same behaviour. However, Manzini's theory clearly predicts that there should be no structural restrictions on the reference of PRO or anaphors in these contexts, contrary to fact. Thus, her theory must be abandoned. My claim is that these facts derive from a control theory which is separate from binding theory, though control theory itself needs considerable development to account for this phenomenon. The similarity in behaviour of anaphors and control subjects is entirely due the link between the anaphor and the Hidden Subject, which we assume to be PRO (at least, as long as we assume that there is a PRO element—if we abandon this, the claim must be that whatever determines the interpretation of clauses without subjects also restricts the interpretation of elements inside these particular NPs).

[8] Manzini does not discuss this datum and in fact her theory predicts that it should be ungrammatical as although the anaphor does not have a binding domain here, there is an extra stipulation that anaphors must have an antecedent. Note however that the assumption that anaphors in these contexts behave like PRO because they are bound by a Hidden Subject which is PRO rather undermines Manzini's theory that PRO is an anaphor.

[9] Actually, Chomsky (1986) claims that controlled PRO cannot take split antecedents either, on the basis of the following datum:

(i)*Bill wanted Tom to decide [PRO to swim across the pond together]

However, this can be explained in terms of a locality constraint: PRO can take split antecedents (as (17) demonstrates) as long as both are within the relevant local domain. Obviously in (i) *Tom* is within this domain, but *Bill* is outside of it.

[10] A further problem arises here for the assumption that Hidden Subjects are PRO. In the previous note, we pointed out that PRO can take split antecedents, but only within a local domain. We should therefore expect Hidden Subjects to behave the same way. The grammaticality of the following is therefore unexpected:

(i) Bill wanted Tom to look at [HS a picture of themselves]

[11] Huang (1989) points out that the conditions determining obligatory control cannot be lexical as we get obligatory control in certain adjuncts, which are not under the influence of any lexical item:

   (i) John left the company [PRO to work for himself/*oneself]

[12] In which case, as Chomsky (1986) points out, we must assume the Hidden Subject to be optional, otherwise a reflexive would not be able to refer to the matrix subject.

[13] Note, this does not upset things for the account of the pronominals as both (38a) and (38b) would be ungrammatical without a Hidden Subject and the pronoun coreferential with *John*.

[14] Parentheses represent irrelevant information: *i.e.*, the candidate structure has already been 'killed off' and hence conformity to lower ranked constraints is immaterial.

[15] Note that while this theory crucially relies on Case theory to determine when clauses can and cannot have subjects, it is not plagued by the same problems which face those theories that try to determine the distribution of PRO from within Case theory, under the assumption that PRO cannot appear in Case marked positions. For example, we do not get PRO in object of a passive verb, despite this being non-Case marked. For the present theory, this is irrelevant: the EPP only concerns subjects and so will never have anything to say about the object of the passive. I would claim that the reason why we do not get a PRO object of a passive is simply because there is no PRO.

[16] Under the VP internal subject hypothesis, this will be the V' that the subject is sister to.

[17] In fact, the observation made earlier that PRO is able to take split antecedents would seem to suggest that the theta-role of the subjectless clause can be discharged on both the subject and the object at the same time. Clearly, this necessitates a whole new understanding of the notion of theta-role assignment.

[18] Of course, these NPs can be grammatical, but not when the subjectless infinitival clause is seen as a purpose clause. The grammatical reading takes the subjectless clause as a restrictive relative clause, which has altogether a different syntax and semantics, perhaps involving an empty operator.

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