AFTER BINDING

On the Interpretation of Pronouns

by

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Submitted in partial fulfillment
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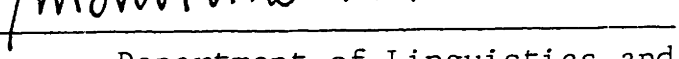
Signature of Author: 

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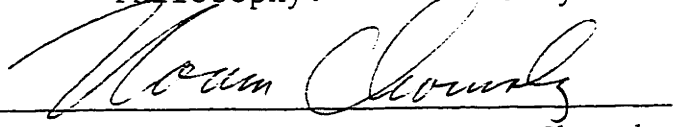
Certified by: 

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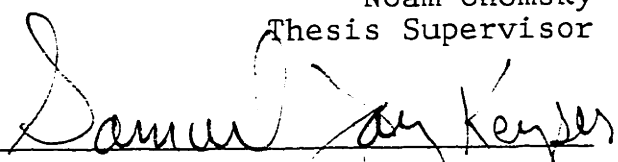
Accepted by: 

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ABSTRACT

This thesis is a study of the interpretation of pronouns, in particular, of the interpretive differences between overt and empty pronouns in certain configurations involving binding phenomena. We have captured these differences by means of a constraint which we have called the Overt Pronoun Constraint (OPC) and which is operative at the level of Logical Form.

Informally, the OPC states that overt pronouns that are in contrastive distribution with empty ones cannot link to formal variables (where by formal variable we roughly mean WH and QR traces). Some theoretically interesting consequences follow from the OPC. For one thing, it shows that the lexical realization (or not) of a pronoun carries with it important interpretive consequences hence arguing for the view that the so called Null Subject Parameter has relevant LF properties. Indeed, if overt pronouns (of the type mentioned) cannot link to formal variables then they cannot be interpreted as bound variables. However, there are certain configurations in which overt pronouns can act as bound variables, and these configurations involve the presence of an extra bound pronoun which serves as a gate for binding. We will show that these cases present us with empirical evidence in favor of a Linking theory of binding (as outlined in Higginbotham 1983).

Furthermore we use the OPC as a diagnostic for both the existence and nature of certain controversial empty categories that occur in constructions such as clitic constructions, restructuring constructions, empty operator binding constructions, etc. The case of sloppy identity is also analyzed in terms of the OPC.

Although our analysis is based on the behavior of Spanish pronouns, we extend it to cover the behavior of pronouns in other Romance languages (Italian, Portuguese, Catalan) as well as in

languages like Japanese and Chinese. The OPC is thus parametrized to account for the subtle differences which underlie the striking similarities between the languages studied.

Thesis Supervisor: Noam Chomsky

Title: Institute Professor

My language did this to me.
-Jack Spicer

PROLOGUE

There is a dialogue in Casablanca that goes something like this:

> Captain: Rick, why did you come to Casablanca?
> Bogart: I came for the waters.
> Captain: The waters? What waters? This is a desert!
> Bogart: I was misinformed...

In my dreams I've played Bogart's part several times. The Captain was played on different occasions by a different member of the Faculty. Was I misinformed? I'm not sure.

This has been as singular an experience as it has been disquieting; one whose price can only be assesed against an entire lifetime. I guess I knew all along that I didn't come here in order to have a good time. But after four years, language has become what history was to Stephen Dedalus: a nightmare from which I am trying to awaken.

So how do I feel now? Hard to tell. I feel the joy and the misery of having accomplished something I don't fully understand: Syntax as Moby Dick.

The acknowledgements and what they represent are part of the joy. I'd like to thank several people, two of whom deserve center stage. Half of what I know about syntax I owe to Noam Chomsky (the other half...). Also, half of what I know about LF-syntax I owe to Jim Higginbotham (the other half I'm afraid I don't understand).

Working with both has been a privilege and I can't thank them enough.

The other two members of my thesis committee also warrant special thanks: Luigi Rizzi and Jim Harris. Their support has proven indispensable for both my linguistic and mental health.

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To Hermann Schultze, my eternal gratitude for uttering the most amazing */?sentence I've ever heard: More people have been to Berlin than I have. (Some have taken this sentence to be a proof of the autonomy of syntax!).

This dissertation wouldn't have gone anywhere without the decisive and indispensable help of Alfred Koumans.

A good deal of what I am I owe to several people in Perú: Luis Jaime Cisneros, José Luis Rivarola, Susana Reisz, Mirko Lauer, Pedro Antonio Bedoya, and los Sanseviero. Para ellos el afecto de siempre.

Finalmente, a Iva, Antonio, Malili, Toño, y Pablo, mucho más que gracias por el afecto, solidaridad, y confianza. This thesis is dedicated, with love, to them.

The following is part of the misery.

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CHAPTER 1

INTRODUCTION

This thesis can be viewed as a footnote to Condition B of Binding Theory (the condition that states the domain in which pronouns must be free). It is a study of the interpretation of pronouns, in particular of the interpretive differences between overt and empty pronouns in certain configurations that involve binding phenomena. For reasons that will be clear in a moment, this study assumes a rather rich and highly structured theory of Universal Grammar (UG), in particular the Government-Binding (GB) model of grammar as outlined and developed in Chomsky (1981) and subsequent studies. In what follows our aim is to present a general overview of the goals of generative research as well as of the organization of the GB model in order to place the discussion of the forthcoming chapters in a more suitable perspective, one which will hopefully relate the material discussed in this thesis to ongoing research on the nature and properties of UG. It is by no means an exhaustive presentation of the GB model, and the reader is referred to Chomsky (1981) and references cited there for a more comprehensive outline. Furthermore, some of the topics which are directly relevant to our investigation, such as binding, pronouns as bound variables, and others, will be dealt with in more detail in the following chapter where we present a Linking theory of binding (following a proposal by Higginbotham

(1983)).

The problem that lies at the core of the generative enterprise is that of constructing a descriptively adequate grammar which at the same time meets the requirements of explanatory adequacy with respect to language learning. This problem has led to the assumption that the language faculty is best characterized as a biological faculty, a mental organ of some sort (cf. Chomksy 1975, 1980) which is sometimes referred to as Universal Grammar (UG). Put in another way, "if grammar is viewed as the outcome of linguistic experience, the experience serving to convert the state of the child from ignorance to knowledge of language, then there is an initial state on which this experience acts in some determinate way" (Higginbotham 1982). This initial state is UG: the contribution of the child to the cognitive state attained on the basis of experience. In this sense, UG is innate, and must be structured in such a way to convey information about what grammars are possible for human languages, and how grammars (among the possible ones) are to be selected. Accordingly, a theory of UG should be based on a (optimally small) number of principles that restrict the class and constrain the form of attainable grammars, allowing at the same time for parameters that must be fixed by experience.

One of the most challenging and interesting aspects of the generative programs is, of course, the search for the principles and properties of UG, as well as for the set of parameters that (once their values are fixed) give rise to the great diversity of human

languages. From this perspective, the pure description of features of a given language (or languages) is never a goal in itself; it is just a step towards the task of deducing those features from the structure ascribed to UG. The problem is thus not the description of a language but to give an account of how does a child come to acquire the grammar of the language (s)he is exposed.

One of the most valuable windows into the properties of UG has been, and is, the research on empty categories, i.e., elements which lack a phonological matrix but that are nevertheless syntactically realized. Since empty categories are, by definition, not directly observable, a question arises as to how the child obtains knowledge regarding their existence and properties. A reasonable way to look at this problem is to assume that the properties of empty categories reflect in some way properties of UG, and thus, the empirical study of such elements should in turn reveal aspects of the structure and functioning of UG. Notice however that the empirical investigation of empty categories cannot be even sensibly posed aithout a sufficiently detailed and rich theory of UG.

Indeed, since the justification for the presence of an element whose existence cannot be verified by sensory data must be found on grounds other than direct perception, what evidence is there for positing the existence of such element? There are essentilly two sources of evidence. One is a theoretical one, an 'imputation of existence': a theory requires such element for it to be true. The second one is empirical, call it 'indirect perception': we

assume the existence of a certain imperceptible element due to the behavior of 'surrounding' material. Both sources of evidence feed each other. This has been the case with study of empty categories. Consider a simple case as illustration.

One of the crucial assumptions of Government-Binding theory is the so called Projection Principle, which we state informally as in (1):

(1) Projection Principle.
Lexical requirements must be met at every level.

Lexical requirements comprise subcategorization frames and θ role assignment. Consider the following example:

(2) John kissed

The subcategorization frame of the verb kiss (assuming it is transitive) will state that such verb requires an Object, that is, an [NP,VP] slot, to which a certain θ role is assigned by the verb. Consequently, if the Projection Principle holds, the structural description of (2) must be (3), irrelevant details aside:

(3) $[_S$ John $[_{VP}$ $[_V$ kissed] $[_{NP}$]]]

The 'curiousity' of (3) lies on the fact that the [NP,VP] slot is not filled with lexical material: the NP category is empty. This

is a direct consequence of assuming the Projection Principle. Notice on the other hand, that (2) and (4) will receive the same formal description (5):

(4) John kissed Mary

(5) $[_S\ [_{NP}\ ]\ [_{VP}\ [_V\ ]\ [_{NP}\ ]\ ]]$

The only difference between (2) and (4) is that the latter example contains an [NP,VP] slot which is filled with lexical material (Mary), but not the former. Let us designate the empty content of [NP,VP] as e.

If this is true, then the explanation for the ungrammaticality of (2) cannot be that kiss being a transitive verb requires an Object but doesn't have one, because after all it does have an Object, namely, $[_{NP}\ e]$, as (3) shows. The explanation must be rather that the occurrence of $[_{NP}\ e]$ in such structure is ruled out by some principle or other that need not concern us right now. In other words, $[_{NP}\ e]$ is an Object all right, but not a suitable one.

Consequently, inside GB, (6) and (7) are ruled out for different reasons: the former is an ill-formed structural description of (2), while (7) is an ill-formed sentence:

(6) $*[_S$ John $[_{VP}\ [_V$ kissed]]]

(7) $*[_S$ John $[_{VP}\ [_V$ kissed] $[_{NP}\ e]\ ]]$

Notice furthermore that (7) is out in English but need not be out in some other language in which $[_{NP}\ e]$ is a possible Object; e.g., Portuguese[1]:

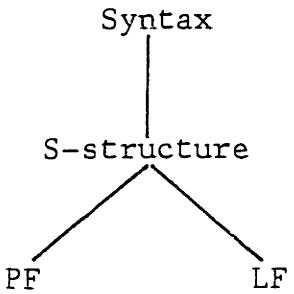
(8) $[_{S}$ Joao $[_{VP}\ [_{V}$ beijou$]\ [_{NP}\ e]\ ]]$

Hence, given the Projection Principle as a principle of UG, the existence of empty categories follows directly. Fixing the appropiate values for a given parameter(s) will explain why the presence of such an empty category is allowed in some languages but not in others. In following chapters we will show that this assumption (regarding the existence of empty categories) presents us with a much better understanding of certain grammatical processes that would appear capriciously random otherwise.

Consider next the question of the form of a model of UG, in particular the model of grammar we shall be assuming, GB theory.

Two approaches to the study of grammar can be distinguished, one which emphasizes systems of rules, and another which emphasizes systems of principles (cf. Chomsky 1981, 1982). Consider first the organization of grammar according to the former approach:

(9)



The rules of Syntax generate S-structures. One system of interpretive rules, PF, associates S-structures with representations in phonetic form. Another system of interpretive rules, LF, associates S-structures with representations in logical form. As Chomsky writes: "The system in (9) embodies certain assumptions about [the association between representations of form and representations of meaning]: namely, that it is mediated by a more abstract S-structure and that the mappings of S-structures onto PF and LF are independent of one another" (Chomsky 1981:17).

A further assumption regarding the system in (9) is that each of the components (the Syntax, PF, and LF) include the rule Move-α , where α is some category. In the Syntax, the single rule Move-α constitutes the transformational component (responsible for such operations as WH and NP movements). In the PF component, Move-α is responsible for the so called 'stylistic rules' (rules of movement, rearrangement, etc.). And in the LF component, the rule of Quantifier Raising (QR, (cf. May 1977)) can be taken as an instance of Move-α .

The Syntax, apart from the rule Move-α , consists of a base which in turn consists of a categorial component and a lexicon. The bas generates D-structures which are associated with S-structures by Move-α . The system in (9), once its components and elements are thoroughly spelled out, will be a theory of Universal Grammar, that is, of the language faculty.

A second approach to grammatical processes emphasizes the role of systems of principles that hold of rules and representations of various sorts. These principles fall into the following subsystems:

(10) a. X-bar theory
b. Θ theory
c. Case theory
d. Binding theory
e. Bounding theory
f. Control theory
g. Government theory

Let us review some of the basic concepts of these subsystems.

X-bar theory deals with properties of syntactic phrase markers. One of its crucial notions is that of head. The ordering of the complements relative to their heads gives way to a classification of languages in two. Languages which are head initial (that is, those in which the complements follow their heads), and languages that are head final (those in which the complements precede them). This has been referred to as the head initial/head final parameter of X-bar theory[2]. However, it is only when the basic principles of X-bar theory interact with other subsystems (like Case and Θ theories) that a desirable simplification of the X-bar schema arises. Questions such as word order are thus dealt with from this modular approach to grammar[3].

θ theory deals with the assignment of thematic roles (θ roles) such as agent, theme, goal, source, etc. to argument positions in a given syntactic structure. The basic principle of θ theory is the θ Criterion which states that each argument is assigned a θ role uniquely, and that each θ role, determined by lexical properties of a head, is uniquely assigned to an argument.

Case theory is concerned with the distribution of lexical NPs and its aim is to provide an adequate characterization of the positions in which lexical NPs may appear. The basic operation involved is the assignment of (abstract) Case to elements in Case marking positions (e.g. Subjects of tensed clauses, Objects of verbs and prepositions). The basic principle involved is the Case Filter, which states that every NP with phonological content must receive Case (cf. Rouveret and Vergnaud 1980, Vergnaud 1982).

Binding theory deals with the relations between anaphors and pronouns and their antecedents (if they have one). What lies at the core of Binding theory are the binding conditions, which can be stated as follows:

(11) Binding Conditions.

A. An anaphor must be bound in certain domain D.

B. A pronoun must be free in certain domain D.

C. An R-expression must be free.

Where bound means A-bound (i.e., c-commanded by a coindexed NP in an A-position), and free means A-free. The domain D in which ana-

phors must be bound and pronouns must be free is characterized in terms of the notion of governing category (cf. Chomsky 1981). We will return to these questions in the following chapter.

Bounding theory is concerned with locality conditions on the application of the rule Move-α. It has the Subjacency Condition (cf. Chomsky 1973) as its basic notion and part of its task is to characterize the parametric variations in terms of bounding nodes across languages (cf. e.g. Rizzi 1980).

Control theory deals with the empty pronominal PRO and the choice of antecedents for it[4].

Government theory is concerned with the notion of government, one of the basic structural concepts underlying many of the principles under (10). Indeed, some notion of government is required in Case, θ, and Binding theories. The central idea is that of the relation holding between the head of a construction and the categories that depend on it. One of the basic principles of government theory is the Empty Category Principle (ECP), which roughly states that traces must be properly governed (a requirement stronger than simple government)[5].

All these principles interact in a number of ways and also interact with the system of rules under (9). "Each of the systems of (9) and (10) has associated with it certain parameters, which are set in terms of data presented to the person acquiring a particular language. The grammar of a language can be regarded as a particular set of values for these parameters, while the overall system

of rules, principles, and parameters is UG..." (Chomsky 1982:7).

Let us return now to the question of empty categories. If the Projection Principle (cf. (1)) is correct, then an empty category is present wherever a θ role is assigned but the corresponding θ position contains no lexical material. In Chomsky (1982) an extension is suggested to this principle, namely an added requirement to the effect that sentences have Subjects. If this extension is correct, then the category S must always contain a Subject, that is, an [NP,S] slot. Consequently, if no lexical material occurs in such position we must assume the existence of an empty NP Subject. Standard examples of these empty Subjects are given below:

(12) a. $[_{NP}$ e] vaticinó el eclipse
e predicted the eclipse (= 'He/she predicted the eclipse')

b. $[_{NP}$ e] to predict eclipses is dangerous

In (12a) an empty Subject appears in the [NP,S] position of a tensed sentence. These are the typical empty Subjects of Null Subject languages. In (12b) an empty Subject appears in the [NP, S] position of a tenseless sentence. These empty Subjects, commonly referred to as PRO, give rise to an ARB(itrary) interpretation (as in the exampled showed) or to Control PRO, as in sentences like (13):

(13) John wants $[_{NP}$ e] to win

Several questions arise once we accept the existence of empty categories, questions regarding their distribution, typology, content, interpretation, etc. A way to start dealing with these questions is to reconsider the types of expressions Binding theory is concerned with, in essence, anaphors and pronouns. If the Binding theory is right, then we ought to find four possible types of expressions:

(14) a. [+ anaphor, - pronominal]
b. [- anaphor, + pronominal]
c. [+ anaphor, + pronominal]
d. [- anaphor, - pronominal]

Let us consider first lexical NPs and how they partition in terms of (14). An example of (14a) will be overt anaphors such as each other or herself. These are pure anaphors subject to condition A of Binding theory. Overt pronouns shuch as he, them, illustrate the type (14b), elements subject to condition B. And, (14d) is illustrated by R-expressions such as John, the nurse.

Notice that there cannot be an overt expression satisfying (14c): a pronominal anaphor must be an ungoverned element[6] and hence if lexical and Case is assigned under government, such an element would violate the Case Filter.

Consider next the case of empty categories and their partition in terms of (14). The simplest assumption would be that the typo-

logy of empty categories mirrors that of overt ones; and indeed that seems to be the case.

A preliminary inventory renders four types of empty categories which satisfy the four types of expressions predicted by (14). An example of (14a) is an NP-trace, a pure anaphor that must be bound in its governing category following condition A of the Binding theory. In this sense, an NP-trace is the empty counterpart of lexical anaphors such as each other, herself. (14b) is illustrated by the empty pronominal pro, the phonologically-null counterpart of lexical pronouns (and hence, is subject to condition B). Type (14c) is illustrated by PRO, the ungoverened Subject of tenseless sentences. And (14d) is illustrated by variables (WH and QR traces).

Consequently, we arrive at the following partition of elements, overt and empty:

(15)

	Overt	Empty
a. [+ ana. , - pron.]	each other, herself	NP-trace
b. [- ana. , + pron.]	he, them	pro
c. [+ ana. , + pron.]	Ø	PRO
d. [- ana. , - pron.]	John, the nurse	variables

In a way, this approach to the typology of empty categories

implies what has been called a functional interpretation, an approach suggested in Chomsky (1981:Ch.6) and developed in Chomsky (1982). The functional interpretation of empty categories assumes that there is only one type of empty category, and hence, that the status of a particular occurrence of an empty category as NP-trace, pro, PRO, or variable, is functionally determined by the empty category's role in derivations and representations[7].

This approach in turn implies that empty categories have no intrinsic content[8], but that their content is functionally determined either by their antecedents (if they have one) or by some suitable identifier (in a sense that will be clear in a moment).

A rather elegant extension of these ideas concerning the content of empty categories can be found in Borer (1984b). Borer's approach to empty categories is based on two assumptions:

(16) a. An empty category must be I-identified

b. Empty categories do not have intrinsic features

(16b) complies with the idea stated above that empty categories do not have intrinsic content. (16a) on the other hand states the requirement that empty categories must acquire content by the process of I-identification. By I-identification Borer means roughly 'inflectional identification', but it obviously covers cases in which the identification process is done by a non-inflectional

element. In any case, the process implies the assignment of i-features by an identifier to a coindexed empty category. The relevant i-features can be taken to be some appropiate subset of the set of grammatical features: gender, number, person. By an appropiate subset we mean that not all three features must be assigned in order to achieve a successful identification (although Borer argues, on the basis of Hebrew data, that the person feature must be necessarily assigned).

The fact that these grammatical features are the relevant i-features to be assigned to empty categories has been motivated in Bouchard (1984). Indeed, Bouchard asks what are the minimal properties required for an NP to be an empty category. His answer is that they are the same minimal properties required of an NP to be an argument. These are: a referential index (R-index) and agreement features (F-features).

NP arguments refer to mental objects in a domain D of mental representations (cf. Chomsky 1981). The objects in domain D are taken to be mental representations of real world objects, but it also contains such non real world objects as unicorns and flaws in the argument. Reference to objects in domain D is done by assuming that NPs bear referential indices, which also intervene in the account of facts of coreference and disjoint reference. Bouchard thus assumes a Principle of Denotability which we state in (17):

(17) An NP will denote an object in domain D only if that NP has an R-index. (Bouchard 1984:17)[9].

Assuming then the existence of domain D, what can be said about the individuals in it? The interesting question according to Bouchard is whether strictly grammatical features can define subsets of objects in domain D. He gives the following examples:

(18) a. Laquelle préfères-tu?

b. Which x, such that x is feminine in French, you prefer x

(19) a. Which ones do you prefer?

b. Which x, x a set of objects, you prefer x

c. Which x, such that x is plural in English, you prefer x

Bouchard explains: "In (18) the objects of domain D are divided into two subsets, depending on their gender in French: the answer to the question can be anything that is feminine in French. Similarly in (19), under readicg (19c), the objects in domain D are divided into two subsets, depending on their number: the answer to the question can be anything that has the intrinsic feature plural in English (e.g. trousers, scissors, etc.). The reading in (19b) is the case where a plural in the real world is a proper answer, i.e., more than one individual (Bouchard 1984:15-16). And Bouchard goes on to prove that the same is true of pronouns, thus concluding that "individuals in domain D have grammatical features" (Bouchard 1984:16).

Going back to Borer's ideas, we can derive two consequences from the assumptions in (16). First, lexical NPs need not be identified because they have intrinsic i-features. In a way, lexical

NPs identify themselves. And second, if a structure contains an empty category then it must also contain a certain I-identifier in order to identify the empty category in question. Borer argues that INFL (when rich enough), coindexed antecedents, controllers, and governing clitics are I-identifiers. Consider for example:

(20) a. pro dibujó una línea
pro drew a line

b. What$_i$ did John buy t_i

c. John$_i$ wants PRO to win

d. El detective lo$_i$ vio e_i

In (20a) the empty category in Subject position (pro) is identified by INFL, which is rich enough to assign the appropiate set of i-features to the empty Subject. Thus, pro is interpreted as [3rd person, singular] = he/she. The trace in (20b) is identified by its coindexed antecedent, what. The control PRO in (20c) is identified by its controller, John. And the empty category in Object position is identified by the governing clitic lo, which also assigns its i-features [3rd person, singular, masculine] to the empty element, thus identifying it[10].

Consider finally the question of the interpretation of empty categories. Here again the optimal hypothesis is to assume that

empty categories are interpreted in a way that mirrors the interpretation of overt ones. However, this hypothesis seems to run into trouble when confronted with certain aspects of the interpretive behavior of overt and empty pronouns in configurations that involve binding phenomena. As a preview of things to come, consider the following Spanish pair:

(21) a. Nadie$_i$ cree que él$_j$ es inteligente
('Nobody$_i$ believes that he$_j$ is intelligent')

b. Nadie$_i$ cree que pro$_j$ es inteligente

In (21a) the Subject of the embedded clause is an overt pronoun (él, 'he'), but in (21b) such position is occupied by an empty one (pro). If overt and empty pronouns have the same interpretive behavior (by hypothesis), then both sentences should in principle be interpreted in the same way(s). This is not the case, however. If i=j in (21a) the sentence is out: in (21a) the pronoun must be free. On the other hand, if i=j in (21b), the sentence is perfectly grammatical, and the empty pronoun (pro) can be interpreted as a bound variable. This peculiar behavior of overt and empty pronouns is the subject of this thesis.

FOOTNOTES: Chapter 1

1. We leave aside the question whether (8) is the appropiate structural description of an Object drop sentence. In fact, it is sometimes assumed that the empty Object is bound by an empty operator in Topic position (cf. Huang 1983, and footnote 10 below).

2. cf. Koopman (1983) for a derivation of this parameter from parameters of Case and θ theories.

3. cf. Stowell (1983) for a detailed discussion of these and related questions.

4. cf. Manzini (1983) for discussion. Cf. also Bouchard (1984) for a different approach.

5. An enormous ammount of research has gone to the study of the ECP and ECP effects in recent years. The ECP doesn't play a role in our study, but the reader is referred to Chomsky (1981), Pesetsky (1982), Lasnik and Saito (1983), and Kayne (1984) for some of the more relevant approaches.

6. Assume x to be a pronominal anaphor. By virtue of its pronominal feature it must be free in its governing category (following condition B of Binding theory). But by virtue of its anaphoric feature it must be bound in its governing category (following condition A). Ergo, x cannot have a governing category: x is ungoverned. (cf. Chomsky 1981:191).

7. For example, if an empty category is in an A-position and is $\bar{A}$-bound, then it is a variable. If it is not $\bar{A}$-bound then it can either be an NP-trace (if bound by an element without an independent θ role) or pronominal (if free, or bound by an element with

an independent θ role). The distinction between PRO and pro sometimes is drawn in terms of government.

8. Of course, an approach that assumes that empty categories have intrinsic content is also possible (cf. Chomsky 1981).

Yet another way to look at this question is to assume a mixed system of intrinsic and structural (= functional) properties that can be ascribed to category types in general. Consider what the form of this system would look like.

Condition A of Binding theory states that anaphors must be bound in certain domain D. This condition actually comprises two statements: (a) that anaphors require antecedents; and (b) that anaphors must have an antecedent in certain domain (e.g. the antecedent must be a coindexed c-commanding element in the anaphor's governing category). Let's call (a) the intrinsic property of anaphors, and (b) their structural properties. The intrinsic property of anaphors can be understand as in Chomsky (1981:188): "...anaphors are NPs that have no capacity for 'inherent reference'...". And this incapacity is not a structural one (i.e. it doesn't depend on the structure they appear in).

Consider R-expressions. In terms of their intrinsic properties they are exactly the opposite of anaphors: they cannot have an antecedent. As is often said, R-expressions have "inherent semantic content". On the other hand, R-expressions have no structural properties at all, a fact that can de derived from the nature of their intrinsic property. (Here we are taking R-expressions to refer to names and definite descriptions).

Consider finally pronouns. One might suggest that pronouns have no intrinsic properties at all, at least as far as antecedence is concerned. That is, a pronoun may or may not have an antecedent, and so "just by looking at it" one cannot tell whether it has one or not. On the other hand, pronouns have structural properties, namely, the one expressed in condition B of Binding theory.

This considerations lead us to the following chart (where

A=antecedent and F=free in some domain D:

(i)

	Intrinsic	Structural
a. anaphors	+A	-F
b. pronouns	Ø	+F
c. R-expressions	-A	Ø

This approach may in turn permit a reduction of Binding theory. In fact, suppose there are only two elements to be accounted for: anaphors and non-anaphors. An anaphor is an element that is intrinsically marked [+A]; anything else is a non-anaphor. Consequently, we can state the following hypothesis concerning the Binding conditions:

(ii) Condition A: An anaphor is bound in some domain D
Condition Z: A non-anaphor is free in some domain D

Consider next the system proposed and the partition of empty categories. Traces (WH and NP) are intrinsically anaphors: both require an antecedent under the principle of "no free variables" (cf. next chapter). They will differ in terms of their structural properties (aside from possible Case differences). An NP trace will behave like a lexical anaphor. That is, will be marked, in terms of its structural properties as [-F]. Hence, NP-trace = [+A, -F]. On the other hand, a WH-trace will behave as a non-anaphor in terms of its structural properties, i.e. [+F]. Hence, a WH-trace = [+A, +F].

The empty pronoun pro will behave exactly like an overt pronoun, that is, it will be marked as [Ø, +F].

And finally PRO poses some problems for the analysis if we consider that it can be either free (i.e., ARB) or not-free (i.e., Control PRO). In such case, PRO will have no intrinsic properties (similar to all pronominals), or PRO will actually be the cover name for two distinct elements (an unlikely move). However, some recent

proposals (cf. Roeper 1983, Epstein 1984) assume that ARB-PRO is indeed a bound element; bound by an implicit/empty operator. Following this suggestion, we can thus attribute to PRO the properties [+A, +F]. This would mean that the distinction between PRO and WH-trace will have to be found somewhere else (perhaps in terms of the Θ nature of the antecedent, or by means of government).

9. Cf. Bouchard (1984:Chapter 2, fn.4) for important precisions concerning the extension of his Principle of Denotability.

10. Two cases are just apparent problems to this line of analysis: cases of empty elements with no visible identifier around, and the case of ARB-PRO. As suggested in fn. 8, the latter case can be dealt with if we assume that ARB-PRO is indeed bound by either an implicit argument or an empty operator. If so, then these elements constitute suitable identifiers for ARB-PRO.

Similarly with cases of empty categories in Japanese, Chinese, Portuguese (cf. example (8) and fn. 1). In these languages empty elements seem to be able to be identified by empty operators which occur in Topic position (cf. Huang 1983). If so, here again, this empty operator would count as a suitable identifier for the corresponding empty element.

Borer's approach thus holds across the board: if there is an empty category, then there is an identifier. The choice of identifiers is most probably parametric.

CHAPTER 2

A LINKING THEORY OF BINDING

0. Introduction.

In this chapter we introduce the bulk of the technical apparatus needed for our analyses. The discussion will be focused on defining a Linking theory of Binding[1] and some related concepts. In the first section we introduce Linking theory following quite closely the presentation given in Higginbotham (1983a, 1983b). In the second section we introduce some principles of grammar that interact with Linking theory. In the third section we compare certain aspects of linking with coindexing as alternative mechanisms for Binding theory, and in general, as alternative mechanisms to describe antecedence relations in syntax. In section four we discuss the technical aspects of pronominal binding and vacuous quantification. In section five we suggest a possible simplification of Linking theory. And finally, in section six we suggest an expansion of Linking theory to deal with certain cases that seem to require a distinction between coreferential and binding relations.

1. Formal Properties of Linking theory.

As introduced in Higginbotham (1983a, 1983b) linking is a for-

mal device to indicate a certain directional relation holding between two (and only two) positions in a given syntactic structure; in particular, the role of linking is to represent the assignment of the antecedence relation between two positions. Hence, the notion "antecedent of" is defined in terms of linking.

Consider for example the following configuration, where X and Y are positions linked as shown in a certain structure Σ :

(1) $[_{\Sigma} \ldots [Y] \ldots [X] \ldots]$

We say, "X is linked to Y in Σ ". We can express the same by: $L(X,Y)_{\Sigma}$. As the notion "antecedent of" is defined in terms of linking, we can interpret $L(X,Y)_{\Sigma}$ in (1) as "Y is an antecedent of X in Σ ". Accordingly we can write: $A(Y,X)_{\Sigma}$. We thus relate L and A as follows:

(2) If $L(X,Y)_{\Sigma}$ then $A(Y,X)_{\Sigma}$

Read: "if X is linked to Y in Σ , then Y is an antecedent of X in Σ ".

Three properties of linking should be stressed from the start: (a) linking is a directional (i.e. asymmetric) relation: it establishes a relation from one position to another; (b) linking relates two (and only two) positions in a given structure; and (c) linking is not a transitive relation: if X is linked to Y, and Y is

linked to Z, then NOT X is linked to Z.

The notion "antecedent of" is the transitive closure of linking. Consider as illustration:

(3) [... [Z] ... [Y] ... [X] ...]
↑_____| ↑_____|

where X is linked to L, and Y is linked to Z, but, as stated above, there is no link between X and Z (linking not being a transitive relation). On the other hand, in terms of antecedence relations, Y is an antecedent of X, and Z is an antecedent of Y, hence (by transitivity) Z is an antecedent of X. This distinction between linkink and antecedence will prove to be extremely useful later on when we discuss parametric differences in pronominal binding.

Furthermore, it should be pointed out that linking itself is independent of the notion of c-command[2], but the relation antecedent of is sensitive to it. Hence consider a structure like (4a) and its two possible linkings (4b, c):

(4) a. [... [Y] ... [X] ...]

b. [... [Y] ... [X] ...]
↑_____|

c. [... [Y] ... [X] ...]
|_____↑

Suppose furthermore that Y c-commands X. Then, what rules out (4c) will be a condition on the notion of antecedence but not on linking,

although both are closely related. The relevant property here is that "backwards linking" (as in (4c)) is not ruled out as such. The advantages of separating linking from c-command will become apparent in the following chapters.

In principle, linking applies freely between any two positions at S-structure. In Higginbotham (1983a, 1983b) a constraint is placed on this freedom: linking applies only between argument positions. A further proviso is made for movement cases, in which linking is automatic. Movement is taken here to cover both syntactic movement (WH and NP movements) and LF movement (QR). Consequently, all non-movement linking is done at S-structure and only between argument positions. Movement linking is done whenever and wherever movement takes place (S-structure, LF). Both cases are illustrated below:

(5) a. [John] said that [he] ate a pumpkin

b. [Who] did you see [t]

b'. [Everyone] [t] loves Mary

In (5a) linking has applied between argument positions at S-structure. (5b, b') represent cases of automatic linking under movement: (5b) a case of WH-movement (linking applied at S-structure), and (5b') a case of Quantifier Raising (linking applied at LF).

Consider however a case in which linking has applied between two argument positions at S-structure, but linking has "expanded" by movement at LF. It thus follows from what we've said that the linkings should be the following:

(6) a. [Many students] think [they] are intelligent (S-s.)
↑_____|

b. [Many students] [t] think [they] are intelligent (LF)
↑_| ↑_____|

Notice that linking is between argument positions (6a), and so this linking is preserved at LF (6b) only that this time the position to which they is linked is now occupied by a trace (the trace of many students after QR has applied) which in turn is linked to the quantifier expression by automatic linking under movement. As we will see in the following sections this has an important bearing on the proper treatment of pronominal binding, and on the distinction between coreferential and binding relations.

At this point let us summarize our brief presentation of the core properties of linking by distiguishing two sets of such properties. On the one hand, formal properties of the device itself (7a), and onthe other hand, certain 'conditions' on possible linkings (7b).

(7) Properties of linking

a. 'formal': (i) linking is directional (i.e., asymmetric);

(ii) linking relates two (and only two) positions in a given syntactic structure;

(iii) linking is intransitive.

b. 'conditions': (i) the positions related through linking are argument positions;

(ii) linking is automatic under movement[3].

2. Some principles of grammar.

Higginbotham (1983b) suggests the following principles of grammar (8). These principles (plus some others to be presented later) interact with linking theory to render an adequate description of referential dependencies in a grammar.

(8) a. If X c-commands Y, then Y is not an antecedent of X.

b. The interpretation of an expression is given in one and only one way.

c. The interpretation of an item cannot be given in terms of that item itself. That is, an element cannot be dependent on itself: *D(X,X).[4]

d. If X and Y share an antecedent and Y c-commands X, then Y is an antecedent of X.

In what follows we illustrate the interaction between the principles in (8) and linking theory.

Consider first a sentence like (9):

(9) He saw John

Two possible linking configurations must be considered:

(10) a. [He] saw [John]
↑_____|

b. [He] saw [John]
|_____↑

An adequate theory of referential dependencies should rule out both configurations: in a sentence like (9) he and John cannot refer to the same entity (i.e. cannot corefer). Consider (10a) first. If principle (8b) holds (that is, "the interpretation of an expression is given in one and only one way"), and if names hace inherent semantic content, then (11) follows as a theorem of (8b):

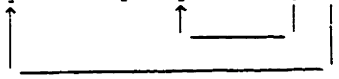
(11) Names cannot have antecedents

because, if they have one, they would be interpreted in more than one way: by themselves, and by their antecedent: a violation of (8b). In consequence, (10a) is out as desired.[5]

Notice furthermore that from (8b) and linking conditions we can derive an adequate treatment of Strong Crossover structures[6].

Consider the following configuration:

(12) [Who] did [he] see [t]

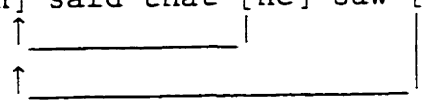


(12) is plainly ungrammatical with the linkings shown. Notice that the link (t,who) is established automatically under movement (cf. 7bii). The question is what blocks the linking (t,he). Again: (8b). If both linkings ((t,who) and (t,he)) occur then t will be interpreted in more than one way, a violation of (8b). Indeed, if the linking (t,who) occurs in (12) then no other linking is possible[7]. This gives us a correct account of Strong Crossover structures rather straightforwardly.

Consider (10b) now, also an ungrammatical sentence with the linking shown. The linking (he,John) establishes that John is an antecedent of he. Notice furthermore that he c-commands John. Hence, by (8a) ('if X c-commands Y then Y is not an antecedent of X') John cannot be an antecedent of he. Consequently the link (he,John) in (10b) is out, as is the sentence.

Consider now a sentence like (13):

(13) [John] said that [he] saw [him]



Intuitively speaking, (13) looks like a violation of some version

of Condition B of Binding theory. Indeed, the linkings shown indicate that both he and him are referentially dependent on the same element, namely John. Thus, (13) will be interpreted as "John said that John saw John" (that is, "John said that John saw himself") which clearly is not a possible interpretation of (13).

A first step towards ruling out (13) is (8d): "if X and Y share an antecedent and Y c-commands X, then Y is an antecedent of X". Such is the situation in (13): both pronouns share an antecedent (John), and he c-commands him, hence he is an antecedent of him.

The second step is the formulation of Condition B of Binding theory, which appears in Higginbotham (1983a) as (14):

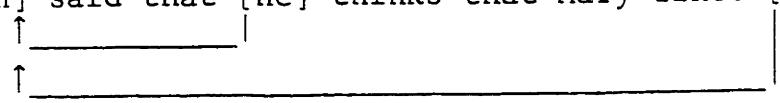
(14) Condition B: If A is a pronominal and B c-commands A in $G(A)^8$, then B is not an antecedent of A.

Now the interaction of (8d) and (14) will rule out (13): according to (8d) he is an antecedent of him, but (14) expresses that he cannot be an antecedent of him, a contradiction.

Notice that (8d) doesn't rule out structures in itself. It just indicates a way in which certain linking configurations ought to be interpreted. In a way, once we know how to 'read' the linkings in (13), Binding theory B rules it out. Notice furthermore that not every sentence whose linkings are interpreted via (8d)

is ungrammatical. Consider for example:

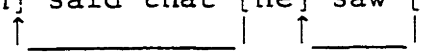
(15) [John] said that [he] thinks that Mary likes [him]



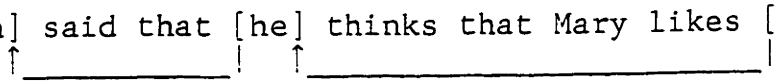
which is perfectly grammatical.

I will thus depart from Higginbotham (1983a) by suggesting that (8d) is actually a relinking convention, by which structures like (13) and (15) are interpreted as if they were (16a, b) respectively:

(16) a. [John] said that [he] saw [him]



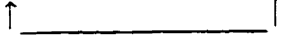
b. [John] said that [he] thinks that Mary likes [him]



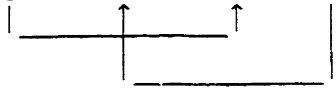
Principles of grammar thus apply to these objects (16a, b) and not to (13, 15). Some advantages of regarding (8d) as a relinking convention will be shown later.

The last principle suggested in (8), namely (8c), deals with cases of circularity, exemplified in (17):

(17) a. [a picture of [it]]



b. [[his] wife] saw [[her] husband]



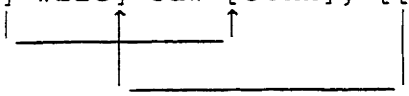
Principle (8c) relies on the following definition of the notion of dependence:

(18) X is dependent on Y if (i) Y is contained in an antecedent of X or (ii) for some Z, X is dependent on Z, and Z is dependent on Y.

Here, "is contained in" is understood as reflexive: Y is always contained in Z if Y=Z. Consequently, (8c) is expressed as *D(X,X), where D indicates the dependence relation. In examples (17a, b) we have precisely cases of this nature. In (17a) it ends up being dependent on itself, and (17b) shows that for it to be a grammatical sentence at least three people should be involved (not two as the circular linkings indicate).

Thus compare (17b) with (19) which is not circular:

(19) [[his] wife] saw [John], [[her] husband]



Hence, we establish principles (8a-c) as part our our grammar, and treat (8d) as a relinking convention.

3. A note on linking vs coindexing.

The standard way to capture binding/coreferential relations

within a GB framework is through coindexing (cf. Chomsky 1980a, 1981). This device is in part similar and in part different from linking. Let us focus in the crucial differences between both. (A) Linking is directional (asymmetric) and coindexing is not directional (symmetric). (B) Linking holds between two and only two positions in a given structure, while coindexing, in essence, is not construed as a relation holding between two and only two positions. (C) Linking is intransitive but coindexing is transitive (if X is coindexed with Y and Y is coindexed with Z then X is coindexed with Z).

The differences pointed out might seem at first glance purely notational, but we will try to motivate in what follows some arguments in favor of linking over coindexing. Indeed, the differences seem to be empirical rather than purely notational.

As an introduction I will present two cases discussed in Higginbotham (1983a), and then I will include an argument of my own.

The first case deals with split antecedents and the inherent complications derived from a coindexing account. The complications arise, as Higginbotham points out, from having to device an indicial notation to distinguish overlap from identity. Consider the following example:

(20) John_i told Mary_j $\text{they}_{[i,j]}$ should leave $\quad (i \neq j)$

in the intended interpretation in which they=[John and Mary]. In order to deal with these cases coindexing must be revised as to

assign to each argument a set of numerical indices. This set is to be a singleton if the argument is grammatically singular. As Higginbotham points out, "some care must be taken, because indices can now overlap without being indentical" (Higginbotham 1983a: 400). However, coindexing can overcome these problems by allowing sets of numerical indices as the index of arguments. Further issues remain, however. Condider the following sentences:

(21) a. I like me

b. We like me

which are taken to be ungrammatical. By the expanded coindexing theory of binding, the ungrammaticality can be expressed in the following way:

(22) a. $*I_i$ like me_i

b. $*We_{[i,j]}$ like me_i

But then, what blocks the following indexing?:

(23) a. I_i like me_j $(i \neq j)$

b. $We_{[i,j]}$ like me_k $(k \neq i; k \neq j)$

Lasnik (1981) suggests that a coindexing theory of binding may not be able to make do a single primitive notion of antecedent (in ei-

ther version, coindexing or expanded coindexing), but will have in addition to incorporate a disjoint reference condition. But now, this condition requires a new primitive notion (something like "unlikeness of interpretation").

I believe that there might be another way out of examples like (23), but perhaps this way out will redefine coindexing so as to make it closer to our notion of linking. Consider such an approach. We can view coindexing at least in the following two ways, given a structure like (24):

(24) [... Y_i ... X_i ...]

Coindexing can be taken to express that elements X,Y in (24) 'refer' to the same entity; or it can express a relation of referential dependency holding between them. The problems observed in examples like (23) may be the result of the first version of coindexing. But suppose we choose the second one, namely, the view that coindexing expresses a relation of referential dependency. In that case a structure like (25) -similar in the relevant details to (23)- will be uninterpretable:

(25) [... Y_i ... X_j ...]

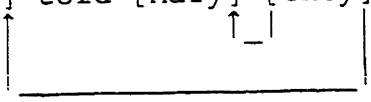
Namely, (25) will express through different indices that Y,X are not referentially dependent.

This possible solution however, makes coindexing a close relative to linking. In other words, this version of coindexing would

be roughly linking minus directionality.

Consider again the split antecedents example, anotated with the linkings shown:

(26) [John] told [Mary] [they] should leave



Nothing in fact prevents these linkings. In each case, linking relates two and only two elements asymmetrically, solving by the way the question of what is an antecedent of what. Notice furthermore that these linkings do not violate any principle in (8a-d).

A second case presented by Higginbotham deals with cases of circularity, which, as we have seen in the last section, can be treated quite straightforwardly with a linking theory of binding relations, by appealing to the notions of antecedence and dependence. Consider for example (17b) in its coindexing version (27):

(27) $[\text{his}_i \text{ wife}]_j$ saw $[\text{her}_j \text{ husband}]_i$

Ruling out this structure is by no means transparent within a coindexing system[8]. Here again, the way out would be to bring coindexing to look like linking by incorporating notions such as antecedence and dependence.

Higginbotham summarizes this brief discussion in the following terms: "...the type of binding theory proposed in Chomsky (1981) which recognizes only the primitive notion of coindexing, should

be conceptually strengthened so as to express anaphoric relations involving plurals. Assigning sets of numerical indices to arguments is one means to this end; but I have suggested further, one may formulate binding theory in terms of an asymmetric primitive of linking instead. This binding theory retains the advantages of assigning sets of numbers as indices, and there are further points in its favor besides. First, a binding theory stated in terms of linking can dispense with any reference to R-expressions. Second, the linking analysis leads to a transparent characterization of 'circular' constructions" (Higginbotham 1983a:405).

I would like to present now a different kind of case that I believe argues in favor of linking over coindexing. Our case exploits the asymmetric property of linking and its independence from c-command considerations. Namely, we want to show that directionality is still crucial in non-c-command domains. Consider first a sentence like (28):

(28) [2 men] believe that pictures of [each other] would amuse [them]

The sentence is grammatical, but linking should provide two ways in which (28) is grammatical (giving way to two possible interpretations) while coindexing should present only one. Both, linking and coindexing, agree in the following relations:

(29) a. $[2\ men]_i$ believe that pictures of $[each\ other]_i$ would amuse $[them]_i$

b. [2 men] believe that pictures of [each other] would amuse [them]

Notice however that each other and them do not stand in a c-command relation. Linking presents a second possibility:

(30) [2 men] believe that pictures of [each other] would amuse [them]

Nothing blocks these linkings, in particular (8a) is not applicable because each other does not c-command its antecedent[9].

There is another way to test this type of linkings. Consider:

(31) [John] told [Mary] that pictures of [each other] would amuse [them]

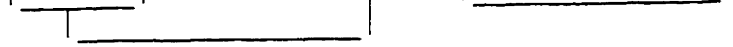
We know that anaphors cannot have split antecedents[10], hence, the only way to save (30) is with linkings indicated: each other has a pronoun (them) as antecedent, which in turn has split antecedents (John, Mary). By the transitivity of the antecedence rela-

tion, John, Mary will be antecedents of each other. Notice then that within our system the prohibition of split antecedents for anaphors should be re-phrased as (32):

(32) Anaphors cannot have split linkings

Because, after all, anaphors can have split antecedents, as (33) shows:

(33) [John] told [Mary] that [they] should kiss [each other] [11]



4. Formal variables and pronominal binding.

In this section we present the technical devices needed to handle pronominal binding. Once the definitions are established we shall state some considerations regarding vacuous quantification.

The basic notion is that of formal variable introduced in Higginbotham (1983a).

(34) Formal variable.

v is a formal variable iff (i) v is an empty category in an argument position; and (ii) v is linked to a lexical operator in a non-argument position.

Simple examples of formal variables are given in (35):

(35) a. [Who] [t] loves Mary
↑_|

b. [Everyone] [t] loves Mary
↑_|

In each case, the trace (of WH-movement in (35a) and of Quantifier Raising in (35b)) is a formal variable according to (34).

We proceed now to establish the relation between formal variables and pronouns as follows:

(36) A pronoun P is a bound pronoun iff (i) P is in the scope of (= c-commanded by) a formal variable v; and (ii) P is linked to v.

Consider for example (37):

(37) [Everyone] [t] thinks that [he] is intelligent
↑_| ↑_____|

where t is a formal variable (following (34)), and the pronoun he is both in the scope of t and linked to it. Consequently, he is a bound pronoun in (37) (bound by the quantifier expression everyone via its QR trace, the formal variable t).

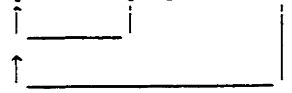
An immediate problem arises with (34, 36) in the light of examples like (38):

(38) [Many students] [t'] were convinced [t] that [they] are smart
↑_| ↑_____| ?__|

where t, an NP-trace is not a formal variable, not being linked to an operator in a non-argument position, but rather to t', the QR-trace of many students, which is a formal variable.

We are confornted with two options: either t is somehow construed as a formal variable or it isn't. Consider the consequences. Suppose t is not a formal variable. Then if the pronoun they is construed as a bound pronoun it must link to t' (a formal variable) following (36). This would mean the following structure:

(39) [Many students] [t'] ... [t] ... [they]

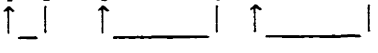


But now notice that (39) is precisely the target of our relinking convention (8d), which we will now formulate as follows:

(40) If X and Y share an antecedent Z, and Y c-commands X, then
(i) unlink (X,Z); and (ii) link (X,Y).

If we apply (40) to (39) the result is (41):

(41) [Many students] [t'] ... [t] ... [they]



Hence, they can't be bound because it is not linked to a formal variable. But we know as a matter of fact that they can be interpreted as a bound pronoun in sentences like (38). Consequently, t must be construed as a formal variable.

In order to do this, we suggest the following addendum to (34):

(42) A non-pronominal empty category linked to a formal variable is a formal variable.

The intuitive notion behind (42) is that NP-traces, which per se are not variables, acquire formal-variablehood in structures in which the head of their chain is in an $\bar{A}$-position (namely, cases in which the head of the chain is quantificational).

A second problem with (34, 36) is related with configurations such as the following:

(43) $[QP]_{\uparrow\_|}\ [t]_{\uparrow\_\_\_\_\_|}\ \ldots\ [P_1]_{\uparrow\_\_\_\_\_|}\ \ldots\ [P_2]_{\uparrow\_\_\_\_\_|}\ \ldots\ [P_3]$

where P is a pronoun and the numerical indices are just devices for ease of reference.

From what we have said so far only P_1 could be a bound pronoun, given that it is the only one linked to a formal variable. Notice that our addendum (42) will not make P_1 a formal variable, because (42), for reasons that will be clear later, applies only to non-pronominal elements. It is clear, however, that P_2,P_3 can be interpreted as bound pronouns, so something must be said with respect to these cases.

Consider a structure like the following:

(44) $[\ \ldots\ P_1\ \ldots\ P_i\ \ldots\ P_n\ \ldots\ ]$

where P is a pronoun, and every $P_{i\ (i\ 1)}$ is such that L(P_i, P_{i-1}). Then we say that (P_1, ... P_i, ... P_n) form a P-chain.

Hence, the pronouns in (45) form a P-chain:

(45) $[P_1]_{\uparrow\_\_\_\_|}$ ... $[P_2]_{\uparrow\_\_\_\_|}$ ... $[P_3]$

We now state (46):

(46) An element of a P-chain is bound iff some element of the P-chain is linked to a (c-commanding) formal variable.

Notice that the notion P-chain relies on linking and not on c-command (c-command is relevant for the formulation of binding). Hence two cases should be considered concerning a structure like (47):

(47) $[P_1]$ ... $[P_2]$ ... $[P_3]$

One case is where P_1 c-commands P_2 and P_2 c-commands P_3. In this case the only linkings that will relate these three positions, and hence form a three member P-chain, are the ones expressed in (45).

A second case arises when the pronouns in (47) are not in a c-commanding relation to each other. If this is the case, then six possible configurations obtain:

(48) a. $[P_1]_{\uparrow\_\_\_\_|}$ ... $[P_2]_{\uparrow\_\_\_\_|}$ ... $[P_3]$ b. $[P_1]_{|\_\_\_\_\uparrow}$ ... $[P_2]_{|\_\_\_\_\uparrow}$ ... $[P_3]$

c. $[P_1] \ldots [P_2] \ldots [P_3]$

d. $[P_1] \ldots [P_2] \ldots [P_3]$

e. $[P_1] \ldots [P_2] \ldots [P_3]$

f. $[P_1] \ldots [P_2] \ldots [P_3]$

In these cases, if P_1 (in 48a,c), P_2 (in 48d,e) and P_3 (in 48b,f) are linked to formal variables (in which scope they are), then all the other members of the respective P-chains are bound too (following (46).

The possibilities of non-c-commanding linkings are strong but empirically grounded as we will study in the following chapter. One remark is nevertheless in order. Suppose we hit the following structure with the linkings shown:

(49) $[P_1] \ldots [P_2] \ldots [P_3]$

Suppose furthermore that there are no c-command relationships between the three positions. Then, nothing in what we've said blocks (49). Recall that our re-linking convention (40) and Higginbotham's principle (8d) apply only in c-command domains. The question whether we want to block configurations such as (49) is left open because we know of no empirical evidence that can decide one way or the other.

With this in mind we make certain considerations regarding

the question of free variables and vacuous quantification[12]. We assume that our grammar has the following two principles:

(50) a. No vacuous quantification

b. No free variables[13]

5. (Towards) A Simplificaction of Linking Theory.

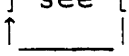
In this section we will suggest a way in which Linking theory can be simplified. The aim is to dispense with the 'conditions' expressed in (7b), namely, the requirements that (a) linking holds between argument positions; and (b) linking is automatic under movement. The elimination of these conditions has two desirable consequences as far as I can see. First, in as much as these conditions can be derived from principles already operative in the system, they seem to be largely redundant. And second, optimally, linking can be reduced to the single property linking is free (plus the characterizations expressed in (7a))[14].

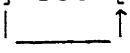
Consider first the condition that says that linking is automatic under movement. Can we dispense with it? Well, consider. If every movement leaves a trace, then that trace must be linked to something given the principle that prohibits free variables (cf. (50b) above). Similarly, if we find an operator in an $\bar{A}$-position, this operator must be binding something, given the principle that prohibits vacuous quantification (cf. (50a) above). So, in principle, (50) solves half of our problems. The other half is a bit more

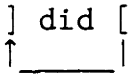
problematic, namely, how do we make sure that the proper linkings (and only the proper ones) hold between variables and operators. Let us take a look at some structures and see how this question may be solved. To begin with, consider Strong Crossover configurations like (51):

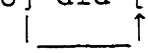
(51) [Who] did [he] see [t]

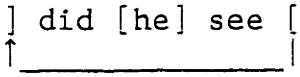
The following are all the linkings possible in (51):

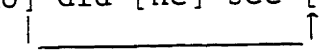
(52) a. [Who] did [he] see [t]


b. [Who] did [he] see [t]


c. [Who] did [he] see [t]


d. [Who] did [he] see [t]


e. [Who] did [he] see [t]


f. [Who] did [he] see [t]


That is, these are all the possible linkings that relate two positions in (51). Later we shall consider linkings that relate all three positions in (51). Needless to say, the only possible grammatical sentence is (52e). All other configurations should be ruled out.

Consider (52b, d, f): all three violate principle (8a). In each case the first term c-commands the second, and consequently the second cannot be an antecedent of the first. Hence, these three configurations are ruled out.

Consider (52c) now: it violates (50a, b). The operator <u>who</u> is

quantying vacuously (because the pronoun he cannot be linked to $\bar{A}$-positions[15]), and more clearly, t is a free variable.

Similarly with (52a): if t is linked to the pronoun he, who will be left quantifying vacuously. Suppose however that we want to rule out the linking (t,he) in itself. Well, consider what t could be: a WH-trace, an NP-trace, PRO, or pro. It can't be pro because pro being a pronominal, is subject to Condition B of Binding theory, a violation of which obtains if t is linked to he in (52a). It can't be PRO either because t is in a governed position. It can't be a WH-trace because it is not $\bar{A}$-bound. And it can't be an NP-trace because it would violate the θ Criterion. We then arrive at the conclusion that if (t,he) obtains, then t can't be anything. Consequently, no such linking is available.

We are thus left with two remaining cases of compound linking to be accounted for:

(53) a. [Who] did [he] see [t]

b. [Who] did [he] see [t]

These two cases reduce to one, namely, (53a) given the fact that our relinking convention will 'translate' (53b) into (53a). Now, (53a) is out for all the reasons mentioned above: because if (t,he) then t can't be any empty category, and because pronouns can't be linked to operators. That is, eventually, (53a) will be out because it violates both (50a, b).

Thus, we are left with (52e), where the linking (t,who) obtains. Notice that both such linking must obtain (to avoid violations of (50)) and no other linking must obtain. These results follow quite straightforwardly from our analysis.

Consider next some grotesque examples:

(54) [Who] did he tell [t] [what] PRO to buy [t]

Indeed, if linking is free and not automatic under movement a configuration such as (54) might occur. What then blocks (54) (beside common sense). Well, here again, (54) is a violation of (8a): if t c-commands what, then the latter cannot be an antecedent of the former (as the linkings intend).

Similarly with (55):

(55) The boy who [every gangster] knew [t] told Mary [what]
to buy [t]

('The boy who knew every gangster told Mary what to buy')

Here, among other things, the QR-trace of every gangster (i.e. the one in Object position of the verb to buy in the diagram) will not be c-commanded by the quantifier expression. In general, if traces mark sites of extraction, then the linkings shown reveal impossible movements.

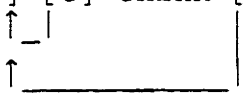
Although not problem-free[16] ,if we state that linking is free instead of postulating that it is automatic under movement, the correct relations between operators and their variables can be predicted and derived from general principles of grammar. If so this is a welcome simplification of the model.

Similar arguments can be made with respect to the second condition on linking, namely, that it must take place only between argument positions. First of all, it is wrong to say that linking obtains only between argument positions as the movement cases show. Second, linking to $\bar{A}$-positions can be blocked in the desired cases by again making use of principles of grammar independently established.

Consider as illustration the following derivation:

(56) a. [Many students] think [they] are dumb (S-s.)

b. [Many students] [t] think [they] are dumb (LF)



If linking is free then its application should be also (unless constrained by some principle or other). Hence, suppose that at S-structure we don't link the pronoun they to many students. Rather, we wait until LF, and then we make the link expressed in (56b). Notice that the other link in (56b) is the link derived from QR. The result will be that now at LF they and t share an antecedent, and moreover, t c-commands they. Consequently, by our relinking convention, (56b) will look like (57) where the

pronoun is adequately linked to an argument position:

(57) [Many students] [t] think [they] are dumb

Consider however cases in which c-command is not involved:

(58) a. The man who saw [them] told Mary [who] to hit [t]

b. The man who saw [them] told Mary [who] to hit [t]

(58b) respects the idea that linking is to argument position (unless movement takes place). Its relevance relies on the fact that backwards linking obtains. I will delay the discussion of these type of cases for the moment. (58a) on the other hand is directly relevant to our discussion. The question is what prevents the linking between them and who, if, after all, preventing such link is desired.

One might argue that the principle of no vacuous quantification is observed by the link (t,who), and that any other link is irrelevant. There are two other ways to look at this question. One is the observation that pronouns cannot be directly linked to operators (pace resumptive ones). Another way to look at this question is by means of the Bijection Principle (cf. Koopman and Sportiche 1982). Namely, an operator (who) will be binding two variables.

6. An extension of Linking theory.

In this section we propose an extension of linking theory in order to capture a distinction that will be crucial for our future analyses: the distinction between coreferential and binding relations. By adopting this distinction we assume that the coreferential reading of a sentence is not a special case of the free one. This system thus renders three types of interpretation: free, coreferential, and bound.

In order to capture these distinctions we introduce a device to interpret antecedence relations through linking by constructing a set L of ordered pairs <X,Y> such that <X,Y> is L(X,Y). L is constructed at every level in which linking relations hold (S-structure, LF), and can be viewed as a mapping of these relations into sets.

Consider as an illustration the following abstract S-structure:

(59) [[Z] ... [Y] ... [X]]
↑_____| ↑_____|

We thus construct a set L as follows:

(60) L: {<X,Y> , <Y,Z>}

Suppose Z,Y,X are not quantificational, then the linking relations expressed in (59) will repeat themselves exactly at LF, rendering a set L' (=L):

(61) L': {<X,Y> , <Y,Z>}

Now, we establish that the antecedent relations in (59) are read off the union set L U L' (call it L*):

(62) L U L' = L* = {<X,Y> , <Y,Z> , <X,Y> , <Y,Z>}

which we simplify as (63):

(63) L*: {<X,Y> , <Y,Z>}

Now L* represents all and only the relevant antecedent relations holding in (59). Namely, Y is the antecedent of X, and Z is the antecedent of Y, and by transitivity, Z is the antecedent of X.

For examples as simple as (59), the requirement of L-sets seems suprfluous, given the fact that the same relations could have been read off directly from (59). We will argue however that L-sets have properties of their own which structures like (59) alone don't have, and that are relevant for grammatical theory.

Consider (59) again, only suppose this time that Z is quantificational. The S-structure set L will be exactly like (60), which I repeat here as (64):

(64) L: {<X,Y> , <Y,Z>}

But given that Z is quantificational, it will QR at LF rendering the follow representation:

(65) [[Z] [t] ... [Y] ... [X]]
↑_| ↑_____| ↑_____|

Accordingly, our set L' will look like (66):

(66) L': {<X,Y> , <Y,t> , <t,Z>}

And L* (= L U L') will be (67), after simplification:

(67) L*: {<X,Y> , <Y,Z> , <Y,t> , <t,Z>}

We now have a problem for the interpretation of L*. Indeed one of the principles of grammar we have assumed indicated that an element can be interpreted in one and only one way (cf. 8b). In L* we have the two following ordered pairs: <Y,Z> , <Y,t> . This means that Y is being interpreted in two ways, by means of Z and t. This is a welcome problem. Indeed, we establish that the L* set (67) is ambiguous, and that it gives way to two different L* sets, call them L*-a and L*-b:

(68) L*-a: {<X,Y> , <Y,Z> , <t,Z>}
L*-b: {<X,Y> , <Y,t> , <t,Z>}

In one set the ordered pair <Y,Z> occurs and in the other the ordered pair <Y,t> .

We want to establish furthermore that <Y,Z> represents a coreferential interpretation of Y. That is, we say, "Y is core-

ferential with Z" (in the assumption that Z is a referential quantifier[17]). Furthermore, <Y,t> , gives rise to the bound interpretation of Y. Indeed, t is a formal variable, and Y is a bound pronoun by virtue of being linked to it (as seen in section 4). Notice that no such link is possible in L*-a. In other words, in L*-a Y is not linked to a formal variable, and hence, is not bound.

A couple of problems should be discussed before we move on. First, we have established that <Y,Z> expresses a coreferential relation. One might wonder why can't it express a binding relation as it happens with the pair <t,Z> . The answer should follow from what we have said in section 4. Namely, in order for pronouns to be bound they have to be linked to a formal variable (or be part of a pronoun chain as defined). Hence, <Y,Z> in itself can never give rise to a bound reading.

A second problem is the following. Consider once again L*-a; in particular the pairs <Y,Z> and <t,Z> . Y and t seem to be sharing an antecedent (namely, Z), so why isn't (8d) or our relinking convention (40) applicable here. Well because the formation of L-sets is a result of linking relations. That is, if relinking didn't apply before L-sets are formed it will not apply to L-sets. This is, by the way, another reason why we regard (8d) as a relinking convention more than a principle of grammar. So the problem vanishes. But notice, on the other hand, that a principle such as (8b) applies all the way, and motivated the construction of two parallel L* sets for (67).

Perhaps a more interesting problem is the fate of X in L*-a and

L*-b. In principle, X should follow the same fate as Y. In particular, if Y is not bound (like in L*-a) then X can't be bound either. If Y is bound (like in L*-b) then X certainly can be bound, under our definition of P-chains. But it need not be, because remember that pairs such as <X,Y> , can be interpreted coreferentially, as was the case with <Y,Z> in L*-a. We thus assume that this is the case with the pair <X,Y> in L*-b: X can either be coreferential or bound.

We now get somewhat closer to natural languages to show this extension of Linking theory at work. Consider (69):

(69) a. [Many students] think [they] are smart
↑_____|

b. [Many students] [t] think [they] are smart
↑_| ↑_____|

(64a) is an S-structure, and (64b) an LF structure. Correspondingly we obtain the following L and L' sets:

(70) a. L: {<they,many students>}.

b. L': {<they,t>, <t,many students>}

And our resulting L* set:

(71) L*: {<they,many students>, <they,t>, <t,many students>}

Which in turn yields the two following L* sets:

(72) a. L*-a: {< they,many students> , < t,many students>}

b. L*-b: {< they,t> , < t,many students>}

The resulting interpretations are thus the following. For L*-a: they is a coreferential pronoun (coreferential that is with many students), and t is bound by many students. For L*-b: they is a bound pronoun because it is linked to the formal variable t. t in turn is bound by the quantifier expression many students. Hence, we distinguish two cases in a sentence like (69): a first case illustrated by L*-a in which the pronoun is treated as a coreferential pronoun, and a second case illustrated by L*-b in which the pronoun is treated like a bound pronoun. Of course, the third possible reading, namely the free one, arises if the pronoun is not linked at all.

Our system makes some interesting predictions. Consider the following sentence:

(73) [Many students] think [$they_2$] said that [$they_1$] are smart

Consider the possible readings of (73), depending on the coreferential/bound interpretation for the respective pronouns. In principle four readings ought to be possible. These are the following, where C stands for coreferential, and B for bound:

(74)	[Many students] ... [$they_2$] ... [$they_1$]
a.	C C
b.	B B
c.	B C
d.	C B

(74a) expresses the reading in which both pronouns are taken as coreferential pronouns. (74b) the reading in which both pronouns are bound. (74c) the reading in which $\underline{they_2}$ is bound but $\underline{they_1}$ is coreferntial. And finally, (74d) the reading in which $\underline{they_2}$ is coreferential and $\underline{they_1}$ bound.

Consider now what can our system say about these cases. The L* set for (73) (assuming that links show relating ($they_1$, $they_2$) and ($they_2$,many students) at S-structure) will be the following:

(75) L*: {<$they_1$,$they_2$> , <$they_2$,many students> , <$they_2$,t> <t,many students>}

Which will yield the following two sets as established above:

(76) a. L*-a: {<$they_1$,$they_2$> , <$they_2$,many students> , <t,many students>}

b. L*-b: {<$they_1$,$they_2$> , <$they_2$,t> , <t,many students>}

Consider L*-a first. The pair <$they_2$,many students> indicates a

coreferential relation between the elements involved. But if so then $\underline{\text{they}}_1$ cannot be bound. That is our system predicts, I believe correctly so, that reading (74d) is impossible. That is, the reading in which $\underline{\text{they}}_2$ is interpreted as a coreferential pronoun and $\underline{\text{they}}_1$ as a bound one.

On the other hand, given L*-b, $\underline{\text{they}}_2$ is bound, but as noted above, $\underline{\text{they}}_1$ can either be bound or coreferential. Hence readings (74b,c) are possible and accounted for. Reading (74a) is the only possible reading for L*-a.

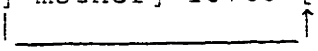
A possible objection to L-sets may come from Weak Crossover configurations such as the following:

(77) [[his] mother] loves [everyone]

After filtering the crossover configuration (78):

(78) [everyone] [[his] mother] loves [t]

the only member of the L* set will be the pair <his,everyone> . But certainly a coreferential reading is impossible. We claim that this is not due to a deficiency of L-sets but to the properties of the elements involved in the linking relation. In fact, contrast (77) with (79):

(79) [[his] mother] loves [someone]


Here again, after filtering the crossover links, we are left with the pair <his,someone> . But here, there is some sense in establishing a coreferential relation between both elements. We argue that an element cannot be coreferential with a non-referential element (like e.g. nobody), and so (77) is worse than (79), again assuming some degree of referentiality in someone but not in everyone.

We will then assume in our following analyses the works of L-sets as sketched in this section. Their relevance to our investigations will be reflected in the next chapters.

FOOTNOTES: Chapter 2

1. Through out this chapter we will be using the term Linking theory to refer to a Linking theory of Binding.

2. A node A c-commands a node B iff the branching node X_1 most immediately dominating A either dominates B or is immediately dominated by a node X_2 which dominates B, and X_2 is of the same category type as X_1. (Cf. Reinhart 1983:23).

3. In section 5 of this chapter we suggest a simplification of Linking theory by means of eliminating (7b) on the grounds that whatever they block, permit, or enforce, can be derived (by and large) fro independent principles of grammar. These principles will be reviewed in sections 2 and 4.

4. For the notion referential dependency cf. Evans (1980). Cf. also (18) below.

5. A note of caution: when we say that names have 'inherent semantic content' and thus are interpreted by themselves, we don't intend this to be a violation of (8c). The reason is that there is no dependency relation holding between John and itself in (9)

6. Perhaps also of Condition C entirely (cf.Higginbotham 1983a).

7. For a more detailed explanation cf. p.55ff.

8. But cf. Brody (1981).

9. A possible objection should be left aside for later analysis: namely the possibility that the linkings shown in (30) violate Condition A of Binding Theory.

10. Consider for example:

(i) *John told Mary about each other

Compare with (ii):

(ii) They talked about each other

11. The question is clearly if (33) is grammatical. Indeed, some people like (33) and some don't. If (33) is grammatical then we must consider a reformulation of Condition A of Binding Theory as formulated in Higginbotham (1983a). If it is taken to be 'weakly' grammatical, we can attribute this fact to Condition A. But then notice that we should expect a contrast that I believe is present, between 'weak' and 'strong' violations of Condition A, as the following examples show:

(i) John told Mary that pictures of each other would amuse them

(ii) John told Mary that pictures of each other would amuse him

In (ii) backwards linking is impossible because each other would be linked to a singular antecedent, and so, the sentence is doomed. The forward linking is also bad because of (32).

Some data from Spanish seem to indicate that the possibility of backwards linking as in (31) should be permitted. I will return to this whole issue in Chapter 3. Notice however that these cases have the potential to argue rather strongly in favor of linking over coindexing.

12. For a detailed study of these questions cf. Finer, Larson, and Montalbetti (forthcoming). There, the question of resumptive pronouns is also dealt with.

13. Quantifiers quantify over variables, where by variable we mean a non-pronominal empty category linked to a non argument position. A formal variable is thus a variable plus the requirement that it be in an argument position. This means that in principle traces in COMP is sufficient in order not to violate

(50a). This in turn allows for a rather straightforward account of resumptive pronouns (cf. Finer, Larson, and Montalbetti (forthcoming)).

14. Cf. also Barss (1984) for arguments to eliminate the requirement of automatic linking.

15. Here and in what follows we shall adopt an extension of an idea proposed in Jaeggli (1983). There he states:

> (i) pro cannot function as a variable locally bound by an operator.

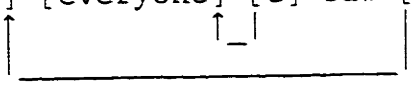
Pace resumptive pronouns, we shall assume that (i) is true of all pronouns (not only of pro).

16. As is sometimes the case, the simplest structures are the more problematic. Chomsky (pc) presents the following problem to our story. Consider (i), from Who saw everyone:

> (i) [Who] [everyone] [t] saw [t']

where t is the WH-trace and t' the QR-trace of everyone. In fact, what blocks the following linkings (if linking is free):

> (ii) [Who] [everyone] [t] saw [t']



I have no straightforward answer to this question. The only way out that I can see for the moment is to stipulate that the link (t,who) must be established at S-structure to prevent the effects of (50).

17. Cf. Haïk (1982) and Bouchard (1984).

CHAPTER 3

THE OVERT PRONOUN CONSTRAINT

0. Introduction.

One of the leading ideas in Government-Binding theory is the so called Null Hypothesis concerning empty categories. The idea was first introduced in Chomsky (1981) but it was in Bouchard (1984) that we find the concept made explicit and the matters of execution worked in detail. A standard formulation of the Null Hypothesis is given in Bouchard (1984:11):

> ...the distribution, type, and content of $[_{NP}$ e] must be fully determined by conditions and principles that apply to the category NP, without discriminating as to whether it is lexical or not. [Emphasis mine].

In this chapter we revisit the Null Hypothesis from a slightly different standpoint. We ask whether the Null Hypothesis can be extended to cover interpretive behavior as well. Paraphrasing Bouchard's formulation, can we assume that the interpretation of $[_{NP}$e] is fully determined by conditions and principles that apply to the category NP without descriminating as to whether it is lexical or not? The conclusion we will arrive to seems to reject this extension of the Null Hypothesis.

In fact, there seem to be cases in which the lexical realization of an NP, say, a pronoun, carries with it a definite interpretive behavior which is not shared by a phonologically null one. Indeed, we will show that in certain syntactic configurations, overt and empty categories are interpreted differently. If this is true then several theoretical consequences follow. An immediate consequence, e.g., is that if the interpretation of an element is sensitive to its being lexical or not, then what has been called the Null Subject parameter cannot be considered solely as a PF phenomenon. In other words, the difference between, say, two pronouns, one overt and the other empty, cannot be <u>just</u> that the former has a phonological matrix and the latter lacks one[1]. We shall show that the lexical realization (or non-realization) of an element carries with it syntactic and semantic properties that are best understood at the level of logical form. Consequently, in addition to the trivial PF properties and its well known S-structure effects, we intend to show that the Null Subject parameter also has theoretically relevant LF properties.

In this chapter we limit ourselves to the study of the interpretive behavior of overt and empty pronouns (in particular, <u>pro</u> and its overt counterpart), and we conclude by suggesting a constraint which we have called the <u>Overt Pronoun Constraint</u> (OPC). Consequences of the OPC will be studied in the next chapter.

1. Background: pronoun typologies.

Following lines suggested by Gareth Evans (1980) we shall assume that a typology of pronouns based on their use should include the following four categories:

A) Free pronouns, that is, "pronouns used to make reference to an object (or objects) present in the shared perceptual environment, or rendered salient in some other way" (Evans 1980:337). Examples of these pronouns are found under (1):

(1) a. He walks smartly

b. I'm glad he's left (= Evans' (2))

B) Coreferential pronouns, that is, "pronouns intended to be understood as being coreferential with a refering expression occurring elsewhere in the sentence" (Evans 1980:337). One of the possible readings of the examples under (2) illustrate this type of pronouns:

(2) a. John thinks he walks smartly

b. John loves his mother (= Evans' (3))

C) Bound pronouns, that is, "pronouns which have quantifier expressions as antecedents, and are used in such a way as to be strictly analogous to the bound variables of the logician" (Evans 1980:337). Examples under (3) illustrate this type:

(3) a. Many butchers think they walk smartly

b. Every man loves his mother (= Evans' (4))

D) E-type pronouns, that is, "pronouns [that] have quantifier expressions as antecedents but (...) are not bound by those quantifiers" (Evans 1980:338). Examples are given under (4):

(4) a. Many butchers play poker and they walk smartly

b. Few M.P.s came to the party but they had a good time (= Evans' (5)).

These four categories of pronouns constitute what can be called the use-typology of pronouns (i.e. they define the ways in which pronouns can be used)[2].

Evans argues, however, that although pronouns can be used in any of the above mentioned ways, there are only two kinds of pronouns: referential and bound. This constitues, if you will, the kind-typology of pronouns. The two typologies are interconnected: pronouns used as 'free', 'coreferential', or 'E-type', belong to the referential kind; a pronoun used as a 'bound' pronoun belongs, predictably enough, to the bound kind.

Two sets of questions come to mind. First, how do empty pronominals sort out with respect to both typologies? E.g., are PRO and pro used in the same ways as their overt counterparts? Needless to say, Evans didn't consider empty pronominals in establishing his typologies. And second, what does the kind distinction mean?

Are referential and bound 'intrinsic' properties of pronouns (i.e. properties that pronouns come with) or rather they are 'structural' properties (i.e. properties read off from the structures pronouns appear in -as Evans himself seems to suggest: "...[the] two kinds of pronouns (...) are sharply distinguished by their grammatical position, and (...) function in quite different ways" (Evans 1980:344)).

Here I will only consider the first question[3], in particular the question of the uses of pro.

Consider then the uses of pro. Can it be used in all four of the prescripted ways? The answer is yes as the following paradigm shows:

(5) a. pro compró un pulpo
('pro bought an octopus' = 'He/she bought an octopus')

b. Juan cree que pro compró un pulpo
('John believes that pro bought an octopus')

c. Muchos plomeros creen que pro compraron un pulpo
('Many plumbers believe that pro bought an octopus')

d. Muchos plomeros compraron un pulpo y pro enloquecieron
('Many plumbers bought an octopus and pro went crazy')

All these sentences are perfectly grammatical in their intended readings: pro can be free in (5a), coreferential in (5b), bound in (5c), and E-type in (5d)[4]. We conclude then that pro can be used in any of the four ways established in Evans' use-typology.

Example (5c) deserves more attention however. True, in (5c) pro can behave like a bound variable, thus receiving the following LF description:

(6) [Muchos plomeros] [t] creen que [pro] compraron un pulpo

where pro is bound by virtue of its link to a c-commanding formal variable (t), the QR-trace of the quantifier expression muchos plomeros. Thus (6) is interpreted as (7):

(7) (Many x: x a plumber) x thinks that x bought an octopus

A problem arises however with the 'overt' version of (5c):

(8) Muchos plomeros creen que ellos compraron un pulpo

In (8) we have replaced pro by its overt counterpart, the lexically realized pronoun ellos ('they'). Although (8) is perfectly grammatical, it cannot (and does not) mean (7). In other words, in (8) the overt pronoun cannot act as a bound pronoun.

In the rest of this chapter we try to describe and, in some way, explain this curious asymmetry, namely why can't the overt form of the pronoun in examples like (8) be interpreted as a bound pronoun -although the empty form (pro) can, as (5c, 7, 8) show.

Regarding the relation between PRO and the use-typology, we refer the reader to footnote 5.

2. The phenomenon.

Perhaps the best way to introduce the distinction between overt and empty pronouns with respect to their interpretive behavior is to compare English with Spanish. Consider the following English sentence:

(9) Many students believe that they are intelligent

This sentence is at least 3-ways ambiguous. The source of this ambiguity can be traced back to three different characterizations of the pronoun that occurs in it. In terms of the use-typology just described, the pronoun they in (9) can be used in any of the following three ways: (a) they can be free. By a free pronoun we understand the same as Evans does (cf. preceeding section) but perhaps in a stronger sense: for us, a free pronoun is one that does not have the same reference as any other element in the sentence, not even by accident. This last qualification is intended in order to distinguish free from coreferential readings in the sense that the latter is not a special case (or sub-case) of the former. We will motivate this distinction later in the chapter. A free pronoun is then a pronoun that has no antecedents. (b) they can be interpreted as a coreferential pronoun, coreferential that is with the quantifier expression many students (assuming with Haik 1982 that many is a referential quantifier). And (c), they can be interpreted as a bound pronoun, that is like a variable

bound by the quantifier expression many students via the formal variable resulting from QRing the said quantifier. The fourth possibility, namely the E-type one, doesn't arise because the pronoun is in the scope of the quantifier.

Leaving aside the free reading for the moment, we express the difference between the coreferential and the bound readings in the following way:

(10) a. (Many x: x a student) x believes that THEY are intelligent

b. (Many x: x a student) x believes that x is intelligent

(10a) is supposed to express semi-formally the coreferential reading. Capital THEY is just a notational device to indicate that the pronoun is coreferential with some other element, in this case, with many students. (In a moment we will express the same relation more formally). Under this reading, (9) is interpreted as follows: each member of the set many students believes that all the members of the set are intelligent. This reading is sometimes referred to as the group reading of (9)[6]. On the other hand, (10b) is the traditional rendition of the bound reading. Under this reading (9) means: each member of the set many students believes that he-simself/she-herself is intelligent (without regard to any opinion he/she may have on the intelligence of the others).

In Chapter 2, section 6, we introduce a device to take care of the ambiguity of (9). Here we put it to use.

If the pronoun they is not linked in (9) then it is free.

If the pronoun they is linked to the quantifier expression at S-structure (11a) then it is linked to the QR-trace of that quantifier at logical form (11b):

(11) a. [Many students] believe that [they] are intelligent

b. [Many students] [t] believe that [they] are intelligent

Following our extension of linking, we construct a set L* which is the union of sets L (at S-structure) and L' (at LF). After simplification, we obtain the following L* set:

(12) L*: {<they,many students> , <they,t> , <t,many students>}

We argued that L* sets like (12) were ambiguous in that the element they is being interpreted in two ways, one by many students (as the pair < they,many students > shows) and another by t (as the pair < they,t > shows). We suggested that this should be resolved by constructing two new sets:

(13) L*-a: {<they,many students> , <t,many students>}

L*-b: {<they,t> , <t,many students>}

L*-a represents the coreferential reading of (9) (equivalent to the semi-formal expression (10a)). And L*-b represents the bound reading (equivalent to (10b)).

Sentence (9) is thus ambiguous in the three given ways.

Spanish, as we know, is a Null Subject language, and so, can translate (9) as either (14a, b):

(14) a. Muchos estudiantes creen que ellos son inteligentes

b. Muchos estudiantes creen que pro son inteligentes

In (14a) an overt pronoun(ellos) occurs as the Subject of the embedded clause, while in (14b) an empty pronoun(pro) occupies such position. As we saw in Chapter 1, pro has the features [3rd person, plural] by virtue of its relation with the inflectional element of the verb (its I-identifier). Hence, pro has the same grammatical specifications as ellos in (14) minus the gender feature (Ø in pro but masculine in ellos) which, by the way, is not present in the verbal inflection, and the fact that it lacks a phonological matrix.

Both versions of (9), that is, (14a, b) can be interpreted as containing free pronouns. It is true, however, that in (14b) the prefered reading is one in which pro is linked to the matrix Subject, but nevertheless the free option is available. If then, the pronouns in (14a, b) are not linked to any position then they are interpreted as free pronouns, refering to some object in the shared perceptual environment, or made salient in some other way.

If the pronouns are linked, in this case to the quantifier expression muchos estudiantes then, parallel to the English case, one might expect that each sentence (14a, b) should be ambiguous

between the coreferential and the bound readings (as the English sentence was). Curiously enough, this is not the case. Only (14b) is ambiguous between the coreferential and bound readings. (14a) is unambiguous: the pronoun can only be interpreted as coreferential. In other words, the pronoun in (14a) cannot be interpreted as a bound variable.

The asymmetry is thus established as follows: the lexically realized pronoun (ellos) in structures like (14a) cannot be construed as a bound pronoun, while the phonologically-null one (pro) can.

Consider furthermore the following pair, one in which the distinction is more sharply observed:

(15) a. Nadie cree que él es inteligente
('Nobody believes that he is intelligent')

b. Nadie cree que pro es inteligente

The English paraphrase of (15a) is only 2-ways ambiguous. The pronoun he can be either bound or free but not coreferential, since there is nothing to be coreferential with, nobody being a non-referential quantifier. In consequence, if there is a link between the pronoun and the quantifier (at S-structure) and to its QR-trace (at LF), this linking can only be interpreted in a bound fashion, like in (16):

(16) (No x: x a person) x believes that x is intelligent

In Spanish, in both sentences (15a, b) the option of regarding the pronoun as free (that is, unlinked) is available. On the other hand, if the pronoun is linked, the antecedence relation must be one of binding as just explained. But, the asymmetry observed in the pair (14a, b) repeats itself here. Only (15b) can mean (16). Sentence (15a), which contains an overt pronoun, cannot mean (16), and in fact, it doesn't. Consequently, (15b) is ambiguous between a free and a bound reading (as its English version is), but (15a) is unambiguous: it can only be interpreted as containing a free pronoun.

The contrast observed in examples (14a, b) and (15a, b) remains the same with different quantifiers:

(17) a. Algunos estudiantes creen que ellos son inteligentes
('Some students believe that they are intelligent')

b. Algunos estudiantes creen que pro son inteligentes

(18) a. Siete estudiantes dijeron que ellos irán al cine
('Seven students said that they will go to the movies')

b. Siete estudiantes dijeron que pro irán al cine

(19) a. No mas de siete estudiantes pensaron que ellos ganaron la carrera
('Not more than seven students thought that they won the race')

b. No mas de siete estudiantes pensaron que pro ganaron la carrera

None of the a sentences can be interpreted as containing a bound pronoun. The lexically realized pronouns in these sentences may be interpreted as coreferential (if the possibility is available given the nature of their antecedent) or as free pronouns. On the other hand, the phonologically-null pronouns in the b sentences may be interpreted as bound pronouns (in addition to their construal as coreferential or free pronouns)[7].

Notice then that what these examples have in common is that an overt pronoun cannot be bound by a quantifier expression. The coreferential possibilities are left open (when available). Hence, if, for example, the antecedent of an overt pronoun is not quantificational, the contrast between overt and empty pronouns vanishes, as is the case in (20):

(20) a. [Juan] cree que [él] es inteligente

('John believes that he is intelligent')

b. [Juan] cree que [pro] es inteligente

Both sentences are interpreted in the same way. Pragmatic considerations may have a preference for (20b) if the Subject of the embedded clause is intended to be coreferential with the Subject of the matrix, but leaving this aside, both pronouns (the overt and the null one) may be used in the same ways in these non quantificational structures.

3. Contrastive environments.

A tempting way to deal with the examples reviewed so far might be to state simply something like (21):

(21) Overt pronouns cannot be bound (in Spanish)

Put in linking terms, (21) expresses the following: if a linking from X to Y obtains, where Y is a quantifier expression and X a pronoun, the possibility of construing X as a bound variable depends on the nature (overt/empty) of X. If X is overt, then X cannot be interpreted as a bound variable.

However, as simple as it is to state (21) so it is to refute it. Consider for example (22):

(22) [Muchos estudiantes] creen que [[sus] bicicletas] son azules

('Many students believe that their bicycles are blue')

Given tha fact that muchos estudiantes is a quantifier expression and that sus is an overt pronoun, and given (21), if the latter is linked to the former, then the pronoun cannot be interpreted as a bound variable. But this result is clearly wrong. (22) can certainly be interpreted as containing a bound pronoun, that is, like in (23):

(23) (Many x: x a student) x believes that x's bicycle is blue

Or consider the following example, due to Jaeggli (1983):

(24) [Muchos estudiantes] quieren que María se case con [ellos]

('Many students want Mary to marry them')

Here again an overt pronoun is linked to a quantifier expression and so (21) predicts that the former cannot be interpreted as a bound pronoun. But here again the prediction is wrong. (24) can certainly mean (25):

(25) (Many x: x a student) x wants Mary to marry x

Similarly, the following examples contain overt pronouns that can be interpreted as bound variables, in violation of (21):

(26) a. [Nadie] quiere que María hable de [él]

('Nobody wants Mary to talk about him')

b. [Muchas mujeres] dijeron que el libro fue escrito por [ellas]

('Many women said that the book was written by them')

c. [Algunos pescadores] temen que el barco parta sin [ellos]

('Some fishermen are afraid that the boat will sail without them')

Sentences (22), (24), and (26a-c) are obvious counterexamples to (21). All of these sentneces contain overt pronouns linked to a quantifier expression and can be interpreted as bound variables. It is worth noting however that all these sentences have something else in common beside being counterexamples to (21): the pronouns in them occur in positions in which empty pronouns cannot appear. Consider for example the pro-versions of (22) and (24), both of which are ungrammatical:

(27) a. *Muchos estudiantes creen que pro bicicletas son azules

b. *Muchos estudiantes quieren que María se case con pro

Sentences under (26) are equally ungrammatical if the overt pronoun in them is replaced by an empty one. Indeed, Spanish has no empty possesives, nor empty objects of prepositions. Hence, these positions are such that a pro cannot appear in them. The reason behind this behavior may be sought in the fact that pro in these positions lacks an I-identifier, and consequently would be left unidentified (violating the assumptions we stated in Chapter 1 (16)). Indeed, prepositions are not inflected in Spanish, so pro in (27b) will be unidentified[8]. Nouns on the other hand, are inflected for gender and number, but argueably not for person. If so, then pro (in the assumption that it is identified by the noun's inflection) will lack a person feature, precisely the feature obligatorily needed in the identification of pro (cf. p.23, and Borer (1984b)). Hence, pro in (27a) will not be properly identified.

This means then that the examples shown above contained overt pronouns which could be interpreted as bound variables, but which occurred in positions in which their empty counterparts could not have. In other words, those positions are such that the overt/empty alternation of pronouns does not obtain: overt and empty pronouns are not in contrastive distribution in such positions.

This observation in turn suggests that the correct way to look at (21) is the following:

(28) a. Overt pronouns cannot be bound

b. (a) applies iff the alternation overt/empty obtains

The second part of (28) makes sure that (28a) applies iff overt and empty pronouns are in contrastive distribution in a given syntactic position. In consequence, (28a) will apply in cases like (17-19) but not in cases like (22), (24), (26a-c) where the empty form was not available[9].

4. The Overt Pronoun Constraint (OPC).

The observation that overt pronouns cannot be bound in Spanish when and only when they were in contrastive distribution with their empty counterparts led us to the formulation of (28). However, even though (28) correctly describes the differences in interpretive behavior between overt and empty pronouns it still misses the mark.

Indeed, overt pronouns can be bound in Spanish other than by bypassing (28b), i.e., the alternation requirement. This is a fortunate property of pronominal binding in Spanish (and in general of Null Subject languages as will be shown later) because it is precisely the fact that overt pronouns can be bound other than by bypassing (28b) that gives theoretical significance to our problem. The failure of (28) to correctly describe the phenomenon under study is related not to the alternation requirement but to the formulation of its first part.

Consider the following sentence as an illustration:

(29) [Muchos estudiantes] [t] dijeron que [pro] piensan que
[ellos] son inteligentes

('Many students said that pro think that they are intelligent')

where t is the QR-trace of muchos estudiantes ('many students') at LF. The empty pronoun pro is linked to this trace, and the overt pronoun ellos ('they') is in turn linked to the empty pronoun. We already know that pro can be bound in (29). The question is whether the overt pronoun can be bound or not. Notice first that ellos occurs in a position where an empty pronoun could have been, and so, (28) would predict that the binding of such pronoun ought to be blocked. But this prediction is wrong. (29) can certainly

mean (30):

(30) (Many x: x a student) x said that x thinks that x is intelligent

That is, the overt pronoun in (29) can act as a bound variable. Notice that (29) illustrates a case in which an overt pronoun can be bound other than by bypassing (28b). This fact renders (28) inappropiate.

In order to have a clearer picture of what is going on in structures like (29), it is useful to compare it with structures like the one illustrated in (31):

(31) [Muchos estudiantes] [t] dijeron que María piensa que [ellos]
↑_| ↑_____|

son inteligentes

('Many students said that Mary thinks that they are intelligent')

(31) is similar to (29) but differs in that the Subject of the middle clause does not participate in the linking relations. A second difference is more revealing: in (31) the overt pronoun cannot be interpreted as a bound variable. Indeed, the only interpretation of (31) is to regard the pronoun as coreferential with the quantifier expression.

The contrast between (29) and (31) is illustrative at least in two important respect. First, it shows that the binding of the

overt pronoun in (29) is not the result of embedding. Second, and perhaps more important, it also shows that the intermediate bound pronoun pro in (29) is playing a crucial role in the binding of the overt one.

Furthermore, consider an example like the following:

(32) [Muchos estudiantes] [t] dijeron que [pro] piensan que
↑_| ↑_____| ↑
|_____|
| María cree que [ellos] son inteligentes |
|_____|

('Many students said that pro think that Mary believes that they are intelligent')

Here again, like in (29), the overt pronoun can be bound. Different from (29) however, the overt pronoun in (32) is in a clause which is not adjacent to the clause containing its pro antecedent. Of course, if pro were to be replaced for an overt pronoun, no pronoun in (32) would be bound.

Suppose then that, as suggested, the binding of the overt pronoun in (29) (and in (32)) is possible thanks to the presence of an intermediate bound pro to which it is linked. The immediate question that comes to mind is what property of pro is licensing the binding of the overt pronoun. One possibility is that overt pronouns may be bound if linked to bound variables. Given the fact that pro in (29),(32), is construed as a bound variable one might wonder if it is this property of pro that licenses the binding of an overt pronoun linked to it. But here again one must make distinctions:

do bound variables in general license the bound interpretation of an overt pronoun, or is it pro acting as a bound variable that has this effect.

This distinction is related to the one made in Chapter 2 between formal variables and bound pronouns. We can thus reformulate the question in the following terms: is it formal variables or bound pronouns that license the bound interpretation of an overt pronoun?

Surely it can't be formal variables. Consider again an example like (33):

(33) [Nadie] [t] cree que [él] es inteligente

('Nobody believes that he is intelligent')

In (33) t is a formal variable (i.e., it is an empty category in an argument position linked to a lexical operator in a non-argument position). But as stated above (cf. our discussion of (15)) the overt pronoun in (33) cannot be interpreted as a bound pronoun. If formal variables license the bound reading of an overt pronoun then this shouldn't be the case. Consequently, it seems that overt pronouns cannot link to formal variables. In fact, all the cases reviewed so far in which an overt pronoun couldn't be bound were cases in which such pronoun was linked to a formal variable.

The second possibility remains, namely, that what licenses the bound reading of an overt pronoun is the fact that it is linked to

a bound pronoun (not to a formal variable). If, as shown above, the link from an overt pronoun to a formal variable should be blocked, the relevance of the presence of a bound pro in examples like (29) and (32) in between a formal variable and the overt pronoun becomes quite evident. It seems, thus, that it is bound pronouns that have the effect of licensing the bound interpretation of an overt pronoun.

We thus state the following constraint:

(34) Overt Pronoun Constraint (OPC).

Overt pronouns cannot link to formal variables iff the alternation overt/empty obtains.

5. The Overt Pronoun Constraint: some predictions.

As formulated in (34) the OPC makes two distinctions that are relevant to describe the differences in interpretive behavior between overt and empty pronouns. First, it distinguishes formal variables from bound pronouns. The latter license the bound reading of an overt pronoun linked to it, but the former don't. A second distinction is implicit in the formulation: the OPC distinguishes between traces that are formal variables and traces that are not. This means that a formulation of the OPC that states that overt pronouns cannot link to traces (without distinguishing between those

that are formal variables from those that aren't) is incorrect. These distinctions are crucial to understand the behavior of overt and empty pronouns, given the fact that the binding of the former is sensitive to the syntactic nature of the 'licenser' .

Let us consider in what follows the question of the empirical adecquacy of the OPC in terms of the distinctions it draws.

The examples studied so far dealt primarily with one instance of formal variables, that is, with the trace of QR. By definition, the trace of QR is a formal variable. Consequently, the OPC blocks the linking from an overt pronoun to such trace. Consider once again as illustration the following examples:

(35) a. [Muchos estudiantes] [t] creen que [ellos] son inteligentes
↑_| ↑_____*_____|

('Many students believe that they are intelligent')

b. [Nadie] [t] cree que [él] es inteligente
↑_| ↑_____*_____|

('Nobody believes that he is intelligent')

In these sentences, the trace t is the trace of QR, a formal variable. The link between the overt pronoun and such a formal variable is starred by the OPC. The consequence of this is that the overt pronoun cannot be interpreted as a bound pronoun. Recall that in Chapter 2 (section 4) we established that a pronoun is a bound pronoun if linked to a c-commanding formal variable, or if a member of a P-chain, one of whose members is linked to a c-commanding formal variable. The first possibility is excluded by the OPC. The se-

cond one doesn't help, because the overt pronouns in (35a, b) are the sole members of their respective P-chains. hence, the overt pronouns can't be interpreted as bound pronouns.

This result can be readily expressed through L*-sets. Consider for example the derivation of (35a):

(36) a. [Muchos estudiantes] creen que [ellos] son inteligentes
↑_____|

b. L-set: {<ellos,muchos estudiantes >}

c. [Muchos estudiantes] [t] creen que [ellos] son inteligentes
↑_| ↑_____*____|

d. L'-set: { *<ellos,t> , <t,muchos estudiantes>}

e. L*-set: {<ellos,muchos estudiantes> , *<ellos,t>
<t,muchos estudiantes>}

In (36a) an S-structure linking relates the overt pronoun to the quantifier expression. Notice that this link is not blocked by the OPC which deals with formal variables, not with quantifiers per se. The linking in (36a) gives way to the L-set in (36b). At LF, the quantifier expression undergoes QR, leaving a trace (a formal variable) behind to which the overt pronoun is now linked. This link is starred by the OPC. The LF linkings are captured in the L'-set in (36d). We have starred the ordered pair <ellos,t> to indicate the OPC effect[10]. The resulting L*-set is given in (36e). The sentence is thus interpreted unambiguously: the overt pronoun has a coreferential relation to its antecedent (muchos estudiantes). Notice that the L*-set doesn't give rise to two new sets, because precisely the

source of the ambiguity vanishes: the pair <ellos,t> is starred. Thus, the bound reading is out.

A similar procedure can be used to describe (35b), but here, there is an added twist. The S-structure linking of (35b) will be the following:

(37) [Nadie] cree que [él] es inteligente
↑_____|

Which in turn gives rise to the following L-set:

(38) L-set: {<él,nadie>}

At LF, after QR has taken place, the structure will be the following:

(39) [Nadie] [t] cree que [él] es inteligente
↑_| ↑____*____|

where the link L(él,t) has been starred following the OPC. The resulting L'-set and L*-set will then be the following:

(40) L': {*<él,t> , <t,nadie>}
L*: {<él,nadie> , *<él,t> , <t,nadie>}

Similar to (35a), the overt pronoun in (35b) cannot be bound. But furthermore, it can't be coreferential either. This conclusion does not arrive from our system of L-sets, but rather, from the nature

of the element the overt pronoun is supposed to be coreferential with (namely, the non-referential quantifier nadie). This means that the pair él,nadie is uninterpretable. Consequently, sentence (35b) is out if some linking relates the overt pronoun to any position whatsoever. In other words, the overt pronoun must be free in structures like (35b).

Let us consider now a second instance of formal variable, namely, a WH-trace. WH-traces fall under the category of formal variables also by definition: they occur in argument positions and are linked to lexical operators in non-argument positions[11]. Consequently, if WH-traces are formal variables, the OPC applies, and should block any link from an overt pronoun to them. Let us verify this prediction. Consider the following examples:

(41) a. [Quién] [t] cree que [él] es inteligente
↑_| ↑____*____|

('Who believes that he is intelligent')

b. [A quién] Pedro convenció [t] de que [él] es inteligente[12]
↑_____| ↑__*__|

('Who did Peter convince that he is intelligent')

c. [Quiénes] [t] dijeron que [ellos] fueron al cine
↑_| ↑_____*_____|

('Who said that they went to the movies')

d. [A quiénes] Pedro convenció [t] de que [ellos] son tontos
↑_____| ↑__*__|

('Who did Peter convince that they are dumb')

In (41a) we have a case of Subject extraction, which leaves a WH-trace behind (a formal variable). The link between the overt pronoun and the formal variable is starred by the OPC. Consequently, the overt pronoun cannot be interpreted as a bound pronoun. In fact, this is correct: (41a) cannot, and does not, mean (42):

(42) (Wx: x a person) x believes that x is intelligent

Similarly with (41b), a case of Object extraction. The overt pronoun is linked to the WH-trace (a formal variable), the link which is precisely excluded by the OPC. Indeed, this result is correct: the pronoun in (41b) cannot be interpreted in a bound fashion. Sentences (41c, d) reflect the same properties, when the WH-antecedent is plural.

These results show that the OPC makes the right distinctions between formal variables and bound pronouns. At least, it shows for the moment, that overt pronouns cannot link to formal variables. Notice furthermore that we get for free the fact that the pronouns in (41a-d) must be free. Indeed, linking at S-structure will never reach the WH element, because it is already in a non-argument position. And, even if it did, the non-referential nature of WH-operators will block any coreferential attempt.

Hence, if the pronoun links at all, it must link to the formal variable, a link which is starred by the OPC. Consequently, the pronouns in (41a-d) must be free for the sentences to be grammatical.

Of course, if instead of overt pronouns we have empty ones, the

corresponding sentences can be interpreted as containing bound pronouns:

(43) a. [Quién] [t] cree que [pro] es inteligente
↑_| ↑_____|

b. [A quién] Pedro convenció [t] de que [pro] es inteligente
↑_____| ↑_____|

c. [Quiénes] [t] dijeron que [pro] fueron al cine
↑_| ↑_____|

d. [A quiénes] Pedro convenció [t] de que [pro] son tontos
↑_____| ↑_____|

Again, these results conform to the OPC.

It is useful next to compare examples (41a-d) with the following ones, in which an intermediate bound pro intervenes in between the formal variable and the overt pronoun:

(44) a. [Quién] [t] cree que [pro] dijo que [él] es inteligente
↑_| ↑_____| ↑_____|

('Who believes that pro said that he is intelligent')

b. [A quién] Pedro convenció [t] de que [pro] diga que [él]
↑_____| ↑_____| ↑_____|

es inteligente

('Who did Peter convince that pro say that he is intelligent')

c. [Quiénes] [t] dijeron que [pro] creen que [ellos] fueron
↑_| ↑_____| ↑_____|

al cine

('Who said that pro believe that they went to the movies')

d. [A quiénes] Pedro convenció [t] de que [pro] digan que
↑_____| ↑_____| ↑
↑_____|
| [ellos] son tontos
|__|

('Who did Peter convince that pro say that they are dumb')

In these examples we have intermediate pros linked to formal variables. These empty pronouns can be bound as we have already seen. The overt pronouns are linked to these empty pronouns, and hence form a P-chain with them. This membership to the P-chain allow the overt pronouns in (44a-d) to be bound.

Notice furthermore that the relevant notion here is linking, not antecedence. In every case in which an overt pronoun is bound, it has a formal variable as antecedent but it is not linked to it. This in turn follows from our characterization of linking as intransitive and antecedence as the transitive closure of linking.

We have shown so far that the OPC makes the correct distinction between formal variables and bound pronouns. We proceed to show now that the implicit distinction found in the formulation of the OPC between formal variables and traces is also correct. In fact, what the OPC blocks is the linking from an overt pronoun to a formal variable, not to an unqualified trace. Consider in this respect the status of an NP-trace.

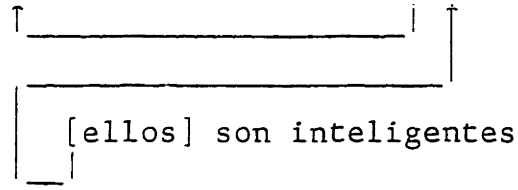
(45) [Juan] fue convencido [t] de que [él] es inteligente
↑_____| ↑_____|

('John was convinced that he is intelligent')

The NP-trace of passive sentence like (45) is not a formal variable: it is not linked to a lexical operator in a non-argument position. Hence, the OPC doesn't block the linking from the overt pronoun to the NP-trace. This is a correct move. The overt pronoun in (45) can certainly be construed as coreferential with the matrix Subject Juan.

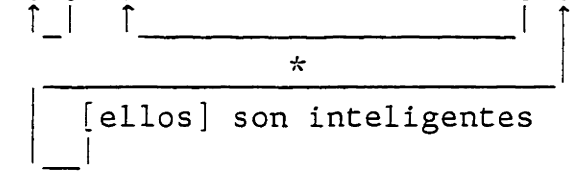
Of course, the clue here is that the Subject of NP-movement is not quantificational. Consider what happens otherwise:

(46) a. [Muchos estudiantes] fueron convencidos [t] de que



('Many students were convinced that they are intelligent')

b. [Muchos estudiantes] [t'] fueron convencidos [t] de que



(46a) is an S-structure representation in which NP-movemente relations are expressed through linking, and in which the overt pronoun is linked to the NP-trace. (46b) is an LF representation. The Subject of NP-movement, being quantificational, undergoes QR, leaving a trace (t') behind. t' is a formal variable. What is at stake now is what is the nature of t (the NP-trace). In Chapter 2 (section 4) we dealt with this very problem and concluded with an addendum to the definition of formal variable that established that

non-pronominal empty categories linked to formal variables are formal variables. Consequently, t in (46b) is a formal variable. But now, if t is a formal variable, the OPC applies, and blocks the linking from the overt pronoun to t. Consequently, the overt pronoun in (46) cannot be interpreted as a bound pronoun.

The difference between examples (45) and (46) can thus be summarized abstractly as follows:

(47) a. [NP] ... [t] ... [overt-P]
↑_____| ↑_____|

b. [QNP] [t'] ... [t] ... [overt-P]
↑_| ↑_____| ↑__*__|

where t is an NP-trace, t' a QR-trace, and overt-P an overt pronoun. The link between the overt pronoun and the NP-trace is permitted only if the NP-trace is not construed as a formal variable. t is a formal variable in (47b) by virtue of being linked to a formal variable, and so, the link from the overt pronoun to it is starred. The NP-trace will be construed as a formal variable only in case it is a member of an $\bar{A}$-chain like the one in (47b), headed by a quantifier expression. In (47a) on the other hand, the NP-trace is not a formal variable, and hence, the link from the overt pronoun to it is permitted[13].

One last remark is in order before we leave this set of examples. Regarding (46) we said that the overt pronoun couldn't be construed as a bound pronoun, and this followed from the OPC. However, the overt pronoun may be interpreted coreferentially. The question is how this interpretation is going to be carried out

through L-sets.

Consider first the case of a non-quantificational antecedent for an overt pronoun linked to a trace like in (45). (45)'s L* set will look like (48):

(48) L*: {< él,t> , < t,Juan>}

where, as we showed, t is not a formal variable. Consequently, the overt pronoun is referentially dependent on whatever t is referentially dependent on, namely, Juan. No binding is involved in this case. Hence, substitutionally, él=Juan, and there is little left to be said about it.

Consider next the case in which the antecedent is quantificational, like in (46). Here the derivation of L-sets will look like the following:

(49) L: {< ellos,t> , <t,muchos estudiantes>}
L': {< ellos,t> , <t,t'> , <t',muchos estudiantes>}

where t is the NP-trace, t' the QR-trace, and L is at S-structure and L' at LF. The resulting L* set will then be (50):

(50) L*: {<ellos,t > , <t,muchos estudiantes> , *<ellos,t>
<t,t'> , <t',muchos estudiantes>}

We disregard the starred pair <ellos,t> but not the unstarred one. Reason: the unstarred pair was an S-structure linking from

the overt pronoun to a trace which was not a formal variable. The starred pair was an LF linking in which the overt pronoun is linked to the same trace, only this time, this trace is a formal variable, for reasons already explained.

(50) then gives rise to two sets, given that t has two antecedents: muchos estudiantes and t'. Consequently, we obtain (51):

(51) L*-a: {<ellos,t> , < t,muchos estudiantes > , < t',muchos estudiantes >}

L*-b: {< ellos,t> , <t,t'> , <t',muchos estudiantes>}

L*-a renders the coreferential interpretation of the overt pronoun. L*-b, we claim, is ill-formed: if <t,t'> obtains, then t is a formal variable, and so <ellos,t> should be starred.

Hence, if the overt pronoun ellos ('they') is linked at S-structure to the NP-trace of a quantifier expression that later will undergo QR, then the sentence is interpreted unambiguously as containing a coreferential pronoun. All the binding possibilities are blocked by the OPC. The free reading is also available only if no linking whatsoever relates the overt pronoun to any other position in the sentence.

Summing up then, the OPC makes two sets of correct distinctions. First, it distinguishes between formal variables and bound pronouns. Only the latter can license the bound interpretation of an overt pronoun. And second, the OPC distinguishes between types of traces (i.e., those that are formal variables -like a WH or QR trace- from

those that aren't -like the NP-trace of a non-quantificational element). Of course, beside making the correct distinctions, the OPC successfully describes the differences in interpretive behavior between overt and empty pronouns.

We have established that only bound pronouns license the binding of an overt one linked to it. The only bound pronoun we have dealt with has been pro, the empty Subject of tensed clauses in Null Subject languages. There is a second candidate for this job, namely, PRO, the empty Subject of tenseless clauses. The question is whether PRO can license the binding of an overt pronoun linked to it, like pro did.

First we show that PRO can be bound. This should follow from the OPC in two ways. Directly, because the OPC refers to overt pronouns and not to empty ones. And indirectly, because PRO is not in contrastive distribution with an overt counterpart[14]; hence, even if the OPC applied to PRO, the second part will allow it to be bound (given that the alternation requirement is not met).

However, direct empirical evidence is also available. Consider the following sentences[15]:

(52) a. [Nadie] [t] cree [PRO] ser inteligente
↑_| ↑_____|

('Nobody believes PRO to be intelligent')

b. [Muchos estudiantes] [t] quieren [PRO] pasar el examen
↑_| ↑_____|

('Many students want PRO to pass the exam')

c. [Quién] [t] quiere [PRO] arreglar el carro

('Who wants PRO to fix the car')

In all these examples PRO can link to a formal variable and be interpreted as a bound pronoun. Hence, (52a) for example, can be interpreted as (53):

(53) (No x: x a person) x believes x to be intelligent

In fact, (53) is the only interpretation of (52a), the coreferential one not being available due to the nature of the antecedent, and the free reading also being blocked by properties of Control structures like the ones examined here. (52b) on the other hand is ambiguous between the bound and coreferential readings.

Hence, PRO can be bound. The question then is if PRO can be a member of a P-chain to enable an overt pronoun linked to it to be bound. Consider the following sentences:

(54) a. [Nadie] [t] quiere [PRO] creer que [él] es inteligente

('Nobody wants PRO to believe that he is intelligent')

b. [Muchos estudiantes] [t] van a [PRO] convencer al director de que [ellos] son inteligentes

('Many students are going PRO to convince the director that they are intelligent')

c. [Quién] [t] espera [PRO] besar a la mujer que [él] ama
↑_| ↑_____| ↑_____|

('Who hopes PRO to kiss the woman he loves')

In all these sentences the overt pronoun can be bound. This means that PRO has the same properties as pro to license the bound interpretation of an overt pronoun linked to it. So here again, the OPC draws the right line by including PRO in the same class as pro, at least with respect to pronominal binding. An overt pronoun need not link to pro in order for it to be bound. It must link to a bound pronominal (PRO, pro) in order to achieve the status of a bound pronoun. In other words, PRO enters P-chain formations.

A second interesting and theoretically relevant result also follows from our previous discussion on PRO. Indeed, if the binding of an overt pronoun in examples like (54a-c) relies crucially on the presence of PRO, then the existence of such empty category is supported rather strongly by our analysis. That is, the syntactic existence of PRO, is the means through which overt pronouns acquired their bound nature in (54a-c). If such an empty category was not present, it is at least troublesome to explain the behavior of overt pronouns in such constructions. Notice furthermore, that we are not talking about implicit arguments[16] in Roeper's (1983) sense, nor of understood Subjects in Chierchia's (1984) approach to Control structures. For us, the syntactic existence of an empty category of pronominal nature in the Subject position of infinitival clauses is crucial for the understanding of the behavior of overt

pronouns. Given the fact that (as shown above) the binding of an overt pronoun is not sensitive to deepness of embedding, an analysis of infinitival clauses that assumes a VP nature of such clauses must explain why overt pronouns are bound in such contexts but not in others.

In theory internal terms, the works of the OPC contributes to support the existence of an empty pronominal in the [NP,S] position of tenseless clauses, on grounds other than the Extended Projection Principle. It is precisely the presence of such element in such position that enables us to understand the behavior of overt pronouns. The same can be said about the existence of pro in tensed clauses, whose presence is required on the same grounds as those for the existence of PRO.

6. Linking and the OPC.

The OPC states that overt pronouns cannot link to formal variables iff the alternation overt/empty obtains. In all the cases examined so far the pronouns involved entered c-command relations which in turn determined unambiguous linkings. That is, in a configuration such as the following:

(55) [Z] ... [Y] ... [X]

where Y and X are pornouns, and Z c-commands both pronouns, and

Y c-commands X, the only possible linkings that relate these three positions are the ones expressed in (56):

(56) [Z] ... [Y] ... [X]
↑_____| ↑_____|

Consider the alternatives. If Y linked to X, then the structure will be out by principle (8a) of Chapter 2: "if X c-commands Y then Y is not an antecedent of X". If X is directly linked to Z then Y and X share an antecedent, and so, by our relinking convention (cf. (40) of Chapter 2) such link will erase itself and will give way to a link from X to Y. In consequence, (56) is the only configuration that can relate the three positions shown, when c-command relations are enforced.

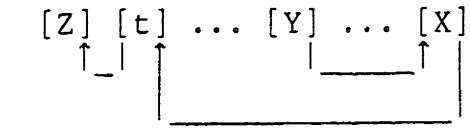
Consider however the possibility that in (55) Y and X are in a non-c-commanding relation to each other, but both are still c-commanded by Z. If this is the case then two sets of linkings that relate all three positions obtain:

(57) a. [Z] ... [Y] ... [X]
↑_____| ↑_____|

b. [Z] ... [Y] ... [X]
↑ |_____↑ |
|_____|

The fact that (57b) is possible at all is in itself interesting. Suppose furthermore that Z is quantificational. Then (57b) will look like (58) at LF, after Z undergoes QR, leaving a formal va-

riable (t) behind:

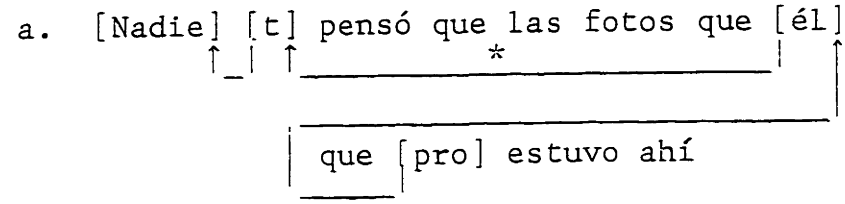
(58) 

If X is a pronoun in (58), then (pace OPC effects) it is bound by virtue of being linked to a c-commanding formal variable. Moreover, (X,Y) form a P-chain. Recall that the existence of P-chains didn't involve c-command, but just linking. In consequence, Y is bound by virtue of being a member of a P-chain with X.

These cases of backwards linking in non-c-command domains is particularly interesting when related to OPC effects. Consider the following sentence:

(59) [Nadie] pensó que las fotos que [él] tomó probarían
que [pro] estuvo ahí
('Nobody thought that the picture he took would prove that pro was there')

In (59) the overt pronoun él ('he') and pro do not c-command each other. Consequently, the former can link to the latter or the latter to the former, giving rise to the two following configurations (at LF, after QR):

(60) a. 

b. [Nadie] [t] pensó que las fotos que [él] tomó probarían

que [pro] estuvo ahí

In (60a) the linking between the overt pronoun and the formal variable is starred by the OPC straightforwardly. Consider (60b) however. The overt pronoun is linked to the empty one which in turn is linked to the formal variable. Nothing blocks these linkings. Recall once again that both pronouns do not c-command each other. And of course, the OPC doesn't apply because the overt pronoun is linked not to a formal variable but to a bound pronominal.

If nothing is wrong with (60b) then we should expect the overt pronoun to be interpreted as a bound pronoun. Indeed, it is in the scope of the formal variable, and it is a member of a P-chain 'headed' by an element linked to the formal variable. This prediction is in fact correct. The overt pronoun in (60b) can be bound. Notice furthermore that a criterion like leftness is irrelevant. The crucial factor in this case is the possibility of backwards linking (permitted by the fact that the pronouns do not c-command each other) that allows the overt pronoun to hook up to a bound pronominal, instead of linking to a formal variable.

Of course, if backwards linking is somehow blocked, there is no way in which the overt pronoun can be bound:

(61) [Nadie] [t] pensó que la foto que [él] tomó le gustaría
↑_| ↑_____*_____|

a María

('Nobody thought that the picture he took would please Mary')

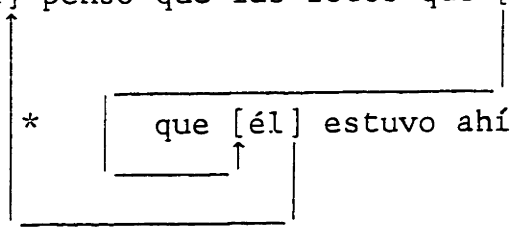
Here the overt pronoun cannot be bound. The reason is quite straightforward. If (as shown in (61)) the pronoun links to the formal variable, the OPC will star such link. Furthermore, there is no backwards linking available. The unavailability of the backwards linking is due to several factors (non of which involve c-command): in (61) if the overt pronoun links to María there will be a gender clash: a masculine pronoun cannot have a feminine noun as antecedent. But even if we replace María, by, say, Jorge, the linking stops there. Jorge being an R-expression cannot link to anything, and so, the pronoun will never be part of a P-chain, and will never reach a formal variable.

Furthermore, if we link the overt pronoun to another overt pronoun, like in (62):

(62)a.[Nadie] [t] pensó que las fotos que [él] tomó probarían que
↑_| ↑_____*_____| ↑
|_____|
[él] estuvo ahí
|___|

('Nobody thought that the pictures he took would prove that he was there')

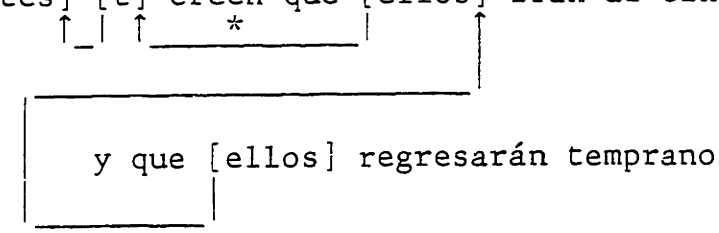
b. [Nadie] [t] pensó que las fotos que [él] tomó probarían



neither pronoun can be interpreted as a bound pronoun in any of the two sets of possible linkings (62a, b).

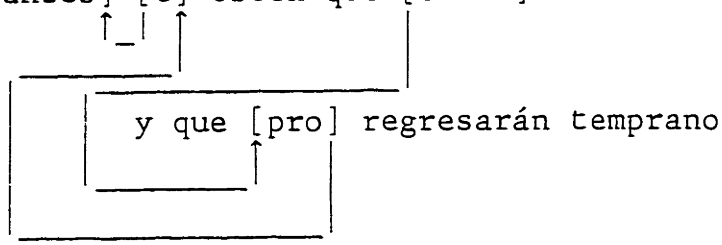
Another case of backwards linking is given below, one which involves coordinate structures. Compare (63a, b):

(63) a. [Muchos estudiantes] [t] creen que [ellos] irán al cine



('Many students think that they will go to the movies and that they will return early')

b. [Muchos estudiantes] [t] creen que [ellos] irán al cine



Consider (63a) first. Neither of the pronouns can be bound, and even if backwards linking takes place, the situation will remain

the same: the OPC will star the link between an overt pronoun and the formal variable. (The coreferential readings is, as predicted, still available).

Consider next (63b). Here backwards linking allows the overt pronoun to link to an empty one, which in turn is linked to the formal variable. The result is that the overt pronoun can be interpreted as a bound pronoun[17].

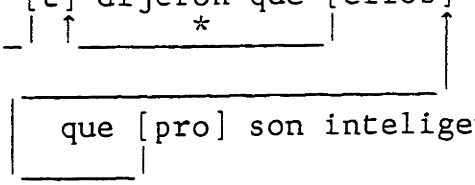
Thus, the possibility of backwards linking in non-c-command domains enables overt pronouns to hook up to empty ones and be interpreted as bound pronouns. This possibility, which arises from our discussion of linking theory enables us, furthermore, to understand the works of pronominal binding in configurations in which overt pronouns seem doomed to be unbound[18].

7. Coreferential and Free pronouns.

Here we return to our discussion in Chapter 2 section 6 concerning the disntinction between coreferential and free readings for pronouns. Recall that we have assumed that a free pronoun is one that has no antecedents, and that a coreferential reading is not to be taken as a special case (or sub-case) of the free one. The convenience of distinguishing between both type of readings will be related to facts of pronominal binding in Spanish, and the OPC.

Consider then the following sentence:

(64) [Muchos estudiantes] [t] dijeron que [ellos] piensan



('Many students said that they think that pro are intelligent')

In (64) the overt pronoun cannot be bound as predicted by the OPC: an overt pronoun can't be linked to a formal variable. Hence, we star such link. Backwards linking is not available in this case because c-commands holds between the overt and the empty pronoun. The question now is what is the fate of pro: can it be bound?

If, as shown in (64) pro is linked to ellos, and given that the overt pronoun cannot link to the formal variable t (by the OPC), then it seems hard to imagine how pro is going to end up linked to the formal variable. Notice that in (64) if pro links at all, it must link to the overt pronoun: if it links to the formal variable, our relinking convention will erase such link and link pro to ellos (which returns us to the original setting (64)). Consequently, if there is a link from the overt pronoun to t, this means that at S-structure, the overt pronoun was linked to the quantifier expression muchos estudiantes. This in turn means that although the bound reading is not permitted for the overt pronoun, the coreferential possibility is still available. In other words, the overt pronoun in (64) can be interpreted co-

referentially with the quantifier expression. Consequently, pro ought to follow the same fate. Indeed, not being able to reach the formal variable, if pro is linked to the overt pronoun it is interpreted as a coreferential pronoun: pro cannot be bound in (64).

(64) should be compared with (65):

(65) [Muchos estudiantes] [t] dijeron que [ellos] piensan
↑_| ↑
| que [pro] son inteligentes
|_____|

In (65), the overt pronoun ellos does not enter the linking relations. This means that such a pronoun is free. But now nothing blocks the linking from pro to the formal variable. Consequently pro is bound in (65). The same results obtain in (66), where we place an R-expression instead of an overt pronoun:

(66) [Muchos estudiantes] [t] dijeron que [María] piensa
↑_| ↑
| que [pro] son inteligentes
|_____|

The contrast between (64) and (65) is instructive. Linkings aside, sentence (64) (or (65)) can be interpreted as containing a bound pro only if the intermediate overt pronoun is free (as in (65)). Otherwise, if the intermediate overt pronoun is linked

to the quantifier expression at S-structure, and so, interpreted as a coreferential pronoun, pro cannot reach the formal variable and fails to be bound (as (64) shows).

Both cases can be represented more clearly as in (67):

(67) a. [QNP] ... [ellos] ... [pro]
↑_____| ↑_____|

b. [QNP] ... [ellos] ... [pro]
↑_____|

Assume both linkings to be S-structure linkings. In (67a) pro will follow the fate of the overt pronoun. Since this cannot be bound by the OPC it can only be coreferential. Hence, pro can only be interpreted coreferentially. In (67b) the overt pronoun is free, not being linked to any other element in the sentence. Hence pro can link to the QNP (and at LF to the formal variable left behind after QR) and be construed as a bound pronoun.

In order to try to explain these facts we make use again of L-sets. Consider the L-sets of (67a):

(68) L: {<pro,ellos> , <ellos,QNP>} (S-structure)

L': {< pro,ellos> , *<ellos,t > , <t,QNP>} (LF)

The resulting L*-set will be (69):

(69) L*: {<pro,ellos> , *<ellos,t> , < ellos,QNP> , <t,QNP>}

Disregarding the starred pair *<ellos,t> ,L* will look like (70):

(70) L*: {<pro,ellos> , <ellos,QNP> , <t,QNP>}

It is clear from (70) that (i) (pro,ellos) form a P-chain; and (ii) that no member of the P-chain is linked to a formal variable. Consequently no member of the P-chain will be interpreted as a bound pronoun, which is precisely the desired result.

Consider next (67b). Its derivation in terms of L-sets will be the following:

(71) a. L: {<pro,QNP>} (S-structure)

b. L': {<pro,t> , <t,QNP>} (LF)

c. L*: {<pro,QNP> , <pro,t > , < t,QNP >}

Now L* will give rise to two new sets, given the pairs <pro,QNP> and <pro,t> :

(72) L*-a: {<pro,QNP > , <t,QNP >}

L*-b: {<pro,t> , <t,QNP >}

Which means that pro in (67b) can be interprted either as a coreferential pronoun (L*-a), or as a bound pronoun (L*-b). And these are, once again, the desired results.

The consequence of this analysis seems to be that indeed core-

ferential and free pronouns must be distinguished. If, for example, we had assumed that every linking expresses binding, and that co-referential elements (like free ones) are not linked at all, we wouldn't be able to express the differences between (67a, b) as we have, assuming otherwise[19].

The fact that pro can't be bound in structures like (67a) shouldn't come as a surprise. In fact, these results should be compared with the results obtained after discussing examples like (73) in Chapter 2, which I repeat here:

(73) [Many students] think that [they$_2$] said that [they$_1$] are smart.

There we discussed the coreferential and binding possibilities of each pronoun, and we concluded that if they$_2$ was taken to be a coreferential pronoun, then they$_1$ couldn't be a bound one. This seems to repeat the case in (67a) where an intermediate o-vert pronoun blocked the binding of an empty one. Hence, after the OPC effects are settled, the binding possibilities of pronouns in Spanish and English seem to behave in the same fashion. Notice furthermore that if they$_2$ is free, then the binding of they$_1$ of-fers no problem whatsoever. Here again the parallelism between this case and (67b) is self-evident.

Thus it seems that a correct account of pronominal binding must include a three way distinction between free, coreferential, and bound readings, as the above analyses suggest.

8. A brief remark on inverted Subjects.

Héctor Campos (p.c.) pointed out that overt pronouns cannot be bound if they are inverted Subjects, even if an intermediate bound pro is present. Consider the following sentences:

(74) a. [Nadie] [t] cree que [pro] dijo que es inteligente [él]
↑_| ↑_____| ↑_____(*)_____|

('Nobody believes that pro said that is intelligent he')

b. [Quién] [t] cree que [pro] dijo que es inteligente [él]
↑_| ↑_____| ↑_____(*)_____|

('Who believes that pro said that is intelligent he')

c. [Muchos estudiantes] [t] creen que [pro] dijeron que son
↑_| ↑_____| ↑
_____|
| inteligentes [ellos]
| (*) |

('Many students believe that pro said that are intelligent they')

These sentences are indeed out with the linkings shown. As Campos observed the inverted pronoun Subjects cannot act as bound variables, even though there is an intermediate pro that could in principle license the binding.

As I see it, this fact is part of a more general one regarding the coreferential possibilities of inverted Subjects. In fact, even without taking into account OPC effects, inverted Subjects have rather clumsy coreferential properties as the following sentences show:

(75) a. [Juan] cree que [él] es inteligente

('John believes that he is intelligent')

b. [Juan] cree que es inteligente [él]
*/?

(76) a. [El corredor] dijo que [él] ganó la carrera

('The runner said that he won the race')

b. [El corredor] dijo que ganó la carrera [él]
*/?

In the a examples the pronoun can link to the matrix Subjects without problem. (Notice that the OPC will do nothing because these Subjects are not quantificational). The same relation is not so felicitous in the b cases, with inverted Subjects. In fact, the inverted Subjects of the b sentences are best interpreted as free pronouns. This might mean that the inverted Subjects are somehow focused in order to achieve referential independence, thus blocking its coreferential possibilities.

Curiously enough, this effect seems to remain the same even in structures containing 'ergative' verbs. Consider:

(77) a. [Juan] cree que llegó [él]
*/?

('John believes that arrived he')

b. [Juan] dijo que salió [él]
*/?

('John said that left he')

Whatever the relation may be between the 'inverted' ergative Subject and the [NP,S] position, these examples behave like the non ergative cases shown in (75),(76).

In any case, it seems that the question of the inverted Subjects is independent from OPC effects[20].

FOOTNOTES: Chapter 3.

1. Another way to put it could be: the difference between overt and empty pronouns is just that the former have a phonological matrix but the latter lack one. Other differences can then be attributed to UG.

2. It should be noticed that a slightly misleading use of the term E-type has appeared in the literature, giving way to two different interpretations of the notion E-type, a structural one and an interpretive one. The former one is, I believe, the one Evans had in mind: an E-type pronoun is one that has a quantifier expression as an antecedent but is not in the scope of that quantifier expression. The interpretive use of the notion E-type (as is sometimes found in Chao and Sells 1983) can be formulated as follows: an E-type pronoun is one that has a quantifier expression as an antecedent but is not bound by it, although the pronoun may be in its scope. In this interpretive sense, a sentence like (i)

(i) Many soldiers believe they'll win the war

may be interpreted as containing an E-type pronoun. For us, if the pronoun in (i) is not free and not interpreted as a bound variable, it is a coreferential pronoun.

Throughout this thesis we will refer to E-type pronouns in their structural sense. It is true however, that coreferential and E-type pronouns end up being interpreted in a similar (if not the same) way, but I believe that the structural definition of an E-type pronoun allows for a better understanding of the ways in which pronouns may or may not be used.

3. The second question has been indirectly discussed in fn.8 of Chapter 1.

Furthermore, one could argue (Higginbotham, p.c.) that Evans'

typology is incomplete inasmuch as the binding nature of the anaphoric relation and the semantic character of the antecedent might fully cross-classify. Sloppy identity would be an example of binding by a referential antecedent (as in Reinhart 1983).

For cases of sloppy identity cf. Chapter 4 of this thesis.

4. One might argue that (5d) is actually a case of VP conjunction. If that were the case, then (5d) should be interpreted as (i):

(i) (Many x: x a plumber) x bought an octopus and x went crazy

But the fact is that, although (i) is a possible interpretation of (5d) (assuming the VP hypothesis), (ii) is also a plausible interpretation:

(ii) (Many x: x a plumber) x bought an octopus and THEY went crazy

where THEY='many plumbers' (i.e. a coreferential pronoun). If so, then (5d) must contain a conjunction of Ss not VPs.

Furthermore, Evans' test for E-type pronouns can be applied successfully to pro. If E-type pronouns are interpreted coreferentially with a quantifier expression, then if the said quantifier is not-referential (e.g. if it is negated) then a sentence with an E-type pronoun should be ungrammatical. Consider the contrast in English first:

(iii) a. John owns some sheep, and Harry vaccinates them in the Spring.

b. *John owns no sheep, and Harry vaccinates them in the Spring.

Similarly in Spanish:

(iv) a. Juan posee algunas ovejas y Harry dice que pro son feas
b. *Juan no posee ovejas y Harry dice que pro son feas

pro thus counts as an E-type pronoun.

5. A word on PRO and the use-typology. Symmetric in part to the behavior of pro, PRO can be used as a free, coreferential, and bound pronoun. Consider:

(i) a. PRO to eat pumpkins is dangerous
b. John wants PRO to eat pumpkins
c. Many butchers want PRO to eat pumpkins

Here we assume that PRO in (ia) is 'free' (i.e. that ARB PRO is a case of a free pronoun in terms of the typology).

A problem arises however with the E-type use. It seems that PRO cannot be used as an E-type pronoun. Consider:

(ii) a. When many butchers learn calculus, PRO to solve the problem will be easy
b. When many butchers learn calculus, PRO solving the problem will be easy

(iii) a. John gave many butchers a hint, and then PRO to solve the problem was easy
b. John gave many butchers a hint, and then PRO solving the problem was easy

In none of these sentences can PRO have many butchers as an antecedent, thus failing to act as an E-type pronoun. Notice however that if we replace PRO by an overt pronoun (i.e. for-NP), the E-type reading offers no problem.

(iv) a. When many butchers learn calculus, for them to solve the problem will be easy
b. When many butchers learn calculus, for them solving the problem will be easy

(v) a. John gave many butchers a hint, and then for them to solve the problem was easy

b. John gave many butchers a hint, and then for them solving the problem was easy.

In (iv) and (v)(for)them can have many butchers as antecedent. One might wonder however if something else is going on in these examples, regarding the position of the for-NP element.

Notice furthermore, that even when the antecedent is not quantificational, PRO seems to have trouble finding an antecedent:

(vi) a. When John learned calculus, PRO to solve the problem was easy.

b. When John learned calculus, PRO solving the problem was easy.

As with the examples in (ii) and (iii) here too, PRO is best understood as ARB in reference. Notice that cases like (vi) do not fall under the E-type class.

6. We distinguish this reading from one in which many students is interpreted as if it didn't undergo QR. Namely, that many students as a group has the believe that etc. The distinction is not easy to make: what does it mean for the group to have a belief if it isn't that each member of it has it. But, when possible, the distinction should be kept in mind.

7. We distinguish the bound reading from what sometimes has been called a 'generic' reading. Consider one of these 'generic' sentences:

(i) Nadie acepta que él sea considerado estúpido
('Nobody accepts that he be-Subjunctive considered stupid')

these sentences often appear in Subjunctive mood, and are not to be taken as cases of binding by a quantifier expression. Indeed,

it would be wrong to ascribe to (i) the following logical form:

(ii) (No x: x a person) x accepts that x be considered stupid

But even in this 'generic' reading, the possibilities of construing the overt pronoun as somehow related to the quantifier are rather narrow. I'm endebted to E.Torrego for pointing this out to me.

8. Furthermore, I-identifiers must be local (in some sense). Thus muchos estudiantes is not local enough to identify pro.

9. O.Jaeggli (p.c.) observes that in cases in which the alternation does obtain, an overt pronoun improves its chances of being interpreted as a bound variable if stressed. Personally, I don't perceive the improvement, but assume such a dialect exists. Then, we can still derive this improvement from (28). Indeed, if an overt pronoun is stressed, it doesn't alternate with an empty one: there are no stressed pros (by definition, given the fact that stress assumes a phonological matrix). If then, such an overt pronoun (stressed) can be bound, we reason that it is because (28a) doesn't apply given the alternating pattern required by (28b).

10. A variant of this procedure can simply be to dismiss the link altogether, rendering an L'-set of the form:

(i) L': {<t,muchos estudiantes>}

Hence, starred pairs will just be taken out of the L-sets they appear in.

11. We leave aside the nature of the traces in COMP in cases of long distance extraction.

12. In this and other examples we haven't inverted the Subject (or preposed the V) for ease of graphic display. This is immaterial to our analysis. For a detailed account of this phenomenon in Spanish, the reader is referred to Torrego (1984).

13. This move has one problem: if t in (47b) is a formal variable, then it should violate Condition C of Binding theory, given that it would be bound in its governing category. The question is thus if we want to motivate the existence of syntactic anaphors which behave like formal variables (where formal variable ≠ variable in Binding theory terms).

Another possibility is that NP-traces don't count, and hence, to permit a link like (pronoun, QNP) at S-structure.

14. A tempting move is to assume that PRO is indeed in contrastive distribution with the form for-NP, and hence to apply the OPC to the latter form. This would mean that we should expect an OPC effect in the following pair:

(i) Many philosophers think that PRO to go to Europe is fun
(ii) Many philosophers think that for them to go to Europe is fun

If the OPC can be extended to such pairs, then it must predict that binding in (ii) is blocked. That is, that (ii) cannot mean (iii):

(iii) (Many x: x a philosopher) x thinks that for x to go to Europe is fun

My English informants tell me that this prediction is not quite correct, and that (ii) can mean (iii). This would mean that PRO and for-NP do not alternate in the OPC sense.

Cf. also fn. 5 of this chapter for the behavior of the 'alternation' PRO/for-NP.

15. For restructuring cf. next chapter.

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Cf. also fn. 5 of this chapter for the behavior of the 'alternation' PRO/for-NP.

15. For restructuring cf. next chapter.

16. Indeed, implicit arguments do not license the bound interpretation of overt pronouns. However, this might be attributed to a different fact, namely, that implicit arguments, although good controllers, like in (i)

(i) The boat was sunk ^{IMP} PRO to collect the insurance

where whoever sunk the boat (=IMP[licit]) is interpreted as whoever intends to collect the insurance; are bad controlees, like (ii) shows:

(ii) The suspect confessed that the boat was sunk ^{IMP} to collect the insurance

where it is impossible to have IMP = the suspect. If so, then IMPs will never be a gate for pronominal binding because they will not tolerate a link to an antecedent, let alone a quantificational one.

17. Some native speakers of Spanish don't like (63b) with the overt pronoun interpreted as a bound variable.

18. Overt pronouns in relative clauses behave by and large like overt pronouns elsewhere, although some speakers perceive that those inside a relative clause may sometimes be interpreted as bound variables. Consider in this respect:

(i) Algunos estudiantes que dijeron que [ellos] son inteligentes murieron ayer
('Some students that said that [they] are intelligent died yesterday')

(ii) Algunos estudiantes a quienes María convenció de que [ellos] se corten el pelo murieron ayer
('Some students who Mary convinced that [they] should get a haircut died yesterday')

Even in non-quantificational contexts, the coreferential possibilities of overt pronouns in relative clauses are not great, compared with the possibilities of pro:

(iii) a. */? Aquél hombre que afirmó que él es inteligente murió ayer
('That man that said that he was intelligent died yesterday')

b. Aquél hombre que afirmó que [pro] es inteligente murió ayer

The interesting thing to notice is, however, the contrast between the following pair:

(iv) a. */? Aquél hombre a quién María convenció de que [él] es inteligente, murió ayer
('That man that Mary convinced that [he] is intelligent, died yesterday').

b. Aquél hombre a quién María convenció de que [él] es inteligente, cree que [pro] será el nuevo director
('That man that Mary convinced that [he] is intelligent thinks that [pro] will be the new director

(ivb) is perfect (or at least markedly better) than (iva) with respect to the construal of the overt pronoun as coreferent with the head of the relative clause. We reason that in (ivb) a case of backwards linking is responsable for the contrast. Indeed, (ivb) is (v):

(v) [Aquél hombre] a quién María convenció [t] de que [él] es inteligente, cree que [pro] será el nuevo director

Thus, this is another case in which backwards linking is operative in establishing coreferential/binding possibilities.

19. Cf. Montalbetti (1983) for an account in which coreferential pronouns don't link.

20. Rizzi (p.c.) informs me that inversion doesn't alter coreferential possibilities in Italian.

CHAPTER 4

SOME THEORETICAL CONSEQUENCES OF THE OPC

0. Introduction.

In Chapter 3 we discussed the Overt Pronoun Constraint (OPC) and showed its relevance in describing the interpretive differences between overt and empty pronouns when they occur in contrastive distribution. In this chapter we intend to use the OPC as a diagnostic for (a) the existence; and (b) the nature of certain empty categories. The form of the diagnostic is the following: suppose we have a structure in which an overt pronoun P is bound. Then, following the OPC, either P doesn't alternate with an empty form or P is a member of a P-chain one of whose members (other than P) is linked to a formal variable. Of course such member of the P-chain cannot be an overt pronoun because the OPC will again block its link to a formal variable. The OPC strongly predicts that overt pronouns cannot link to formal variables; and also, that the element to which an overt pronoun is linked (element which in turn is linked to a formal variable) is a pronominal.

We have already used the diagnostic power of the OPC in the preceding chapter when we discussed the contrast between sentences like (1a, b):

(1) a. Muchos estudiantes creen que ellos son inteligentes
('Many students believe that they are intelligent')

b. Muchos estudiantes quieren creer que ellos son inteligentes
('Many students want to believe that they are intelligent')

As we said, the overt pronoun in (1a), ellos, cannot be bound, but the same overt pronoun in (1b) can. We attributed this difference to (a) the OPC; and (b) the existence of an empty pronominal Subject of creer ('to believe'). Consequently, the structure of (1b) must be (2), with the linkings shown:

(2) [Muchos estudiantes] [t] quieren [PRO] creer que [ellos]
son inteligentes

Thus, with respect to the contrast just mentioned, the OPC contributes to support on empirical grounds the tenor of the Extended Projection Principle, informally, "the requirement that clauses have Subjects" (cf. Chomsky 1982:10).

In the following sections we use the diagnostic power of the OPC to examine the existence and nature of certain controversial empty categories. In section 1 we examine the empty Object position related to an accusative clitic. In section 2 we examine some Restructuring configurations. In section 3 we examine empty operator binding phenomena (in particular, parasitic gap structures and Tough structures). In section 4 we include a note on Sloppy identity.

1. Clitics, empty categories, and the OPC.

1.1 Background.

All the cases studied so far dealt with the difference in interpretive behavior between overt and empty pronouns occurring in Subject position. Given that the OPC applies iff overt and empty pronouns are in contrastive distribution, it is not surprising that such was the case: it is precisely in the [NP,S] position that Spanish pronouns more freely alternate in the desired sense. There is, however, another candidate position. In order to study pronouns in this second position it is useful to revise some concepts discussed in Chapter 1 regarding the existence and identification of empty categories.

Recall that there we assumed Borer's (1984b) approach to empty categories, which, in essence, consisted of the following two assumptions (cf. p.22):

(3) a. An empty category must be I-identified

b. Empty categories do not have intrinsic features

I-identification is thus the process by which an Identifier assigns i-features (Person, Gender, Number,...) to an empty category. If an empty category is not I-identified, or if it is ill-identified, or if there is no Identifier around to do the job, then the structure in which the empty category appears, is ungrammatical.

Consider thus the case of pro in [NP,S] position. By (3b) it

has no intrinsic features. By (3a) it must be I-identified. Having furthermore assumed that [NP,S] is somehow related to INFL, we take INFL as an appropiate identifier. Consequently, pro will be assigned whatever set of i-features INFL has. For example, consider the following sentence:

(4) pro escribí esta oración
[$_S$ pro INFL [$_{VP}$ escribí esta oración]]
(pro wrote this sentence = 'I wrote this sentence')

The empty category in [NP,S] position is identified by INFL, that is, it is given content by the assignment of INFL's i-features, which in this case amount to [first person, singular]. Thus, pro = [first person, singular] = yo ('I').

As said before, the assumptions under (3) apply to all empty categories. We now consider the second position suitable for OPC effects mentioned at the begining of this section, namely, [NP,VP]. Indeed, if the Identificational approach to empty categories is correct, then it is not unreasonable to assume that, at least with respect to identification properties, the relation holding between a pro in [NP,S] position and INFL is parallel to the relation holding between a pro in [NP,VP] position and a ('coindexed/linked') clitic. Consider a sentence like (5):

(5) Juan la vio [e]
[Juan [$_{VP}$ [$_V$ la vio] [e]]]
(John clitic saw [e] = 'John saw her/it')

In (5) the clitic la can be taken as an I-identifier (parallel to INFL). The clitic's features are [third person, feminine, singular], and thus when assigned to the empty Object, it will be interpreted accordingly. More important, the empty Object will be successfully identified. Of course, if no identifier is present, the sentence is out:

(6) *Juan vio [e]
John saw [e]

Two questions arise, the first of which we have discussed in Chapter 1: what justifies the existence of an empty category in Object position in (6); that is, why isn't (7) the correct structure of (6):

(7) [Juan [$_{VP}$ [$_{V}$ la vio]]]

This question was answered by invoking the Projection Principle, which we repeat here as (8):

(8) Lexical requirements must be met at every level.

Hence, if we assume that the verb ver ('to see') is transitive, the lexical requirements of the verb must contain a subcategorization frame such that an (adjacent) NP is required. The fact that in (5) the subcategorized NP is phonologically-null is irrelevant in this respect. If the verb is transitive, such position must

exist.

The second question is what is the nature of the empty category in Object position. This question has been answered in several ways (cf. e.g. Jaeggli 1982, Borer 1984a), attending to, among other things, whether the empty Object is governed or not.

In the following subsection we intend to solve both questions from a rather different angle, that is, by applying the OPC to pronouns in such positions. We conclude, on empirical grounds, that the empty Object in [NP,VP] position must exist, thus arguing in favor of the Projection Principle; and that the empty element in question must be a pronominal (pace the extraction cases which seem to behave differently as we will see in a moment)[1].

1.2 OPC effects in clitic configurations.

In order to apply the OPC as a diagnostic for the existence and nature of the empty category in Object position, we first show that [NP,VP] is a position such that (when a clitic is present) an empty element can alternate with an overt one (i.e., that the empty category and the overt one are indeed in contrastive distribution).

Consider the following pair:

(9) a. Juan lo vio [e]
John cl saw [e]

b. Juan lo vio a él
John cl saw him

The Object position is occupied by an empty element in (9a), and by a lexical pronoun in (9b)[2]. Hence, the alternation obtains. Consequently we should expect an OPC contrast between the a and b sentences below:

(10) a. [Nadie] [t] cree que Juan lo vio [e]
↑_| ↑_____|

('Nobody believes that John cl saw e')

b. [Nadie] [t] cree que Juan lo vio [a él]
↑_| ↑_____*_____|

(11) a. [Muchos estudiantes] [t] creen que Juan los vio [e]
↑_| ↑_____|

('Many students believe that John cl saw e')

b. [Muchos estudiantes] [t] creen que Juan los vio [a ellos]
↑_| ↑_____*_____|

(12) a. [Quién] [t] cree que Juan lo vio [e]
↑_| ↑_____|

('Who believes that John cl saw e')

b. [Quién] [t] cree que Juan lo vio [a él]
↑_| ↑_____*_____|

All the b sentences violate the OPC: an overt pronoun has been linked to a formal variable (QR-traces in (10b) (11b); and a WH-trace in (12b)). Consequently none of the overt pronouns in the examples above can be interpreted as a bound pronoun. Of course, the empty pronouns can.

This answers in part the first question raised in the previous subsection: if there is a definite contrast between the a and b sentences in terms of their binding capabilities, this contrast is very likely due to the fact that in the a sentences an empty element is present in Object position, giving rise to the alternation empty/overt which triggers the OPC effects. If no such position existed, then it would be at least hard to explain the contrast mentioned.

However, the existence of such position becomes evident when we consider more complex structures.

(13) [Muchos estudiantes] [t] creen que el director los persuadió

[e] de que [ellos] son inteligentes

('Many students believe that the director cl persuaded e that they are intelligent')

In (13) the overt pronoun ellos ('they') can be bound. The explanation is already well known: the empty object of persuadir ('to persuade') is linked to a formal variable t (the QR-trace of muchos estudiantes). Hence, e is a bound element. The overt pronoun is in turn linked to e (not to the formal variable t, as in e.g. (11b)) and thus bypasses the OPC effects. Hence, e and ellos form a P-chain, and the overt pronoun is bound by virtue of being a member of it.

Consider the example more carefully. First, if e wasn't present,

how could the overt pronoun be bound? Indeed, if there is no element in Object position of persuade, the overt pronoun must link to the formal variable t. But this link is excluded by the OPC. Consequently, only if we assume the existence of e, can we have an explanation for the binding of the overt pronoun. And second, if the overt pronoun is bound (and it is) by virtue of being linked to e, then e itself cannot be a formal variable, but, most likely, pronominal in nature. Hence we arrive at the conclusion that e exists and that it is a pronominal.

Of course, if the position occupied by e is occupied by a lexical pronoun, neither this nor the most embedded one could be bound because neither could be linked to the formal variable (by the OPC):

(14) [Muchos estudiantes] [t] creen que el director los persuadió
↑_| ↑
*
[a ellos] de que [ellos] son inteli-
↑ ↑
gentes.

The same effects found in (13) can be found in the following examples:

(15) [Nadie] [t] cree que Juan lo persuadió [e] de que [él]
↑_| ↑ ↑ ↑
es inteligente

('Nobody believes that John cl persuaded e that he is intelligent')

(16) [Quién] [t] cree que Juan lo persuadió [e] de que [él]
es inteligente

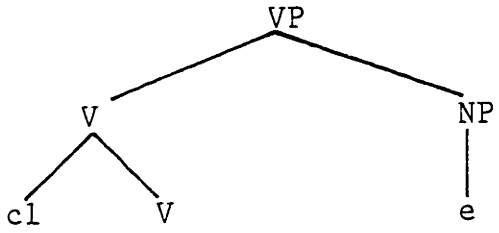
('Who believes that John cl persuaded e that he is intelligent')

Here again, the overt pronouns can be bound, and the explanation is the same as the one given for the overt pronoun in (13). Of course, if e in (15)(16) was changed for an overt pronoun, none of the overt pronouns could be interpreted as bound variables.

These examples show rather convincingly that the existence of an empty pronoun in Object position of the middle clause is necessary. This result is a direct consequence of the OPC.

Furthermore we would like to assume (following Borer 1984a) the following structure for clitic configurations:

(17)



a configuration in which the clitic governs the [NP,VP] position. If the empty category in such position is a pronominal, as our results show, then we conclude that e = pro, given the PRO Theorem to the effect that PRO must be ungoverned[3].

I would like to discuss next cases in which e is a formal

variable in configurations such as (17). These are cases of extraction from clitic doubling constructions attested in some latin american dialects (Argentinian, Peruvian). In these dialects, sentences like (18) are perfectly grammatical:

(18)a.[A quién] lo vio [t] Juan
↑_____|

('Who did John cl see t')

b. [A quiénes] los capturó [t] la policía
↑_____|

('Who did the police cl capture t')

We proceed to test the nature of t by means of the OPC. Consider the following sentences:

(19) a. [A quién] lo persuadió [t] Juan de que [él] es inteligente
↑_____| ↑__*__|

('Who did John cl persuade t that he is intelligent')

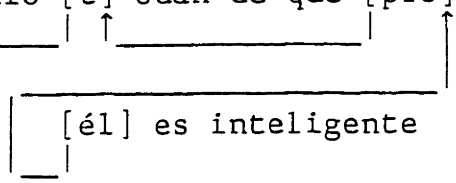
b. [A quiénes] los convenció [t] la policía de que [ellos]
↑_____| ↑_____*_____|
debían entregarse.

('Who did the police cl convince t that they should give up')

Indeed the overt pronouns in these examples cannot be bound. This means that t in (19a, b) is actually a formal variable, as expected. The OPC being in effect, the overt pronouns cannot link to t and hence cannot be bound.

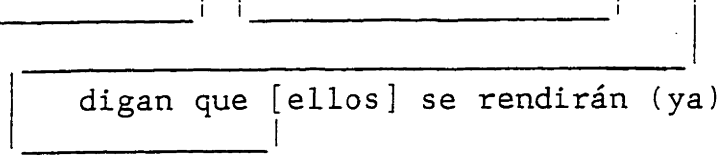
But notice again that an overt pronoun can be bound if an intermediate empty pronoun is available:

(20) a. [A quién] lo persuadió [t] Juan de que [pro] diga que



('Who did John cl persuade t that pro say that he is intelligent')

b. [A quiénes] los convenció [t] la policía de que [pro]



('Who did the police cl convince t that pro say that they should give up (now)')

2. Restructuring and the OPC.

2.1 Background

A second construction in which, we shall claim, the OPC proves to be of use is Restructuring configurations. In this subsection we will outline the theory of restructuring we shall be assuming (i.e. that suggested in Rizzi (1978) and developed in Zubizarreta (1982)) and in the next one we will present the OPC effects.

In Rizzi (1978) a Restructuring Rule is proposed which, infor-

mally speaking transforms "...[an] underlying bisentential structure into a simple sentence". This rule is triggered by modals, aspectuals, and motion verbs, and transforms a structure like (21a) into (21b):

(21) a. $[_S$ Gianni $[_{VP}$ deve $[_S$ PRO $[_{VP}$ presentare la a Francesco]]]]
Gianni must PRO introduce her to Francesco

b. $[_S$ Gianni $[_{VP}$ deve presentare] la a Francesco]

This restructuring process has crucial implications for several syntactic phenomena, among them, clitic placing (CP) (or 'clitic climbing'). Indeed, Rizzi argues that "If restructuring has applied to (21a), yielding the simple structure (21b), nothing can now prevent the clitic pronoun [la, 'her'] from moving to the 'main verb' dovere (in fact, the first lexical verb of the verbal complex) and further application of CP will yield (22)".

(22) Gianni la deve presentare a Francesco

Of course, if restructuring doesn't apply to (21a) the structure remains bisentential, and, as Rizzi notes, the only sentence that can be derived, via CP, is (23), given that the "long step" of the clitic is blocked by the Specified Subject Condition (cf. Chomsky 1977).

(23) Gianni deve presentarla a Francesco

Perhaps the most interesting result of this restructuring process is that (22) and (23) do not differ solely in the linear position of the clitic la, but also differ radically in structure. In fact, by transforming a bisentential structure into a single sentence, we might at least wonder, for example, what happened to the [NP,S] position of the second verb (presentare in our case). It is this consequence of the Restructuring Rule that will occupy us when we apply the OPC as a diagnostic for the existence/non-existence of certain empty categories (in the examples under discussion, the existence/non-existence of the PRO Subject).

Zubizarreta (1982) retakes the Restructuring Rule proposed by Rizzi, but observes a problem. Indeed, suppose that, in general terms, the Restructuring Rule transforms structures like (24a) into (24b):

(24) a. $[_S$ NP $[_{VP}$ V_1 $[_S$ NP $[_{VP}$ V_2 Z]]]]

b. $[_S$ NP $[_{VP}$ $[_{V_x}$ V_1 $V_2]$ Z]]

As Zubizarreta remarks, a structural change like the one illustrated in (24) violates the (Extended) Projection Principle. In (24) the relation between V_1 and the embedded S is destroyed and a new relation is established between the newly formed complex verb V_x and Z. Thus, Zubizarreta concludes, "...the restructuring rule destroys and creates structure in violation of the Extended Projection

Principle which requires that a relation that exists at LF exists at all levels of representation, namely D-structure and S-structure" (1982:141).

Zubizarreta then suggests a solution which has basically two aspects. First, she assumes that the dependency between V_1 and V_2 in the verbal complex V_x is that of an affix with respect to a verb to which it is bound and which it modifies. And second, the Projection Principle problem is solved by assuming that verbs that trigger restructuring are simultaneously affixes and main verbs. This in turn suggests that sentences in which these verbs appear, have two parallel structures, that is, two parallel analyses.

Consider as illustration sentence (25) and the simultaneous analyses given in (26a, b)[4]:

(25) Juan puede visitar a María
('John can/may visit Mary')

(26) a. S-1: $[_{S_1}\ NP_1\ [_{VP}\ V_1\ [_{S_2}\ NP_2\ [_{VP}\ V_2\ NP_3]]]]$

Juan$_i$ puede e_i visitar a María

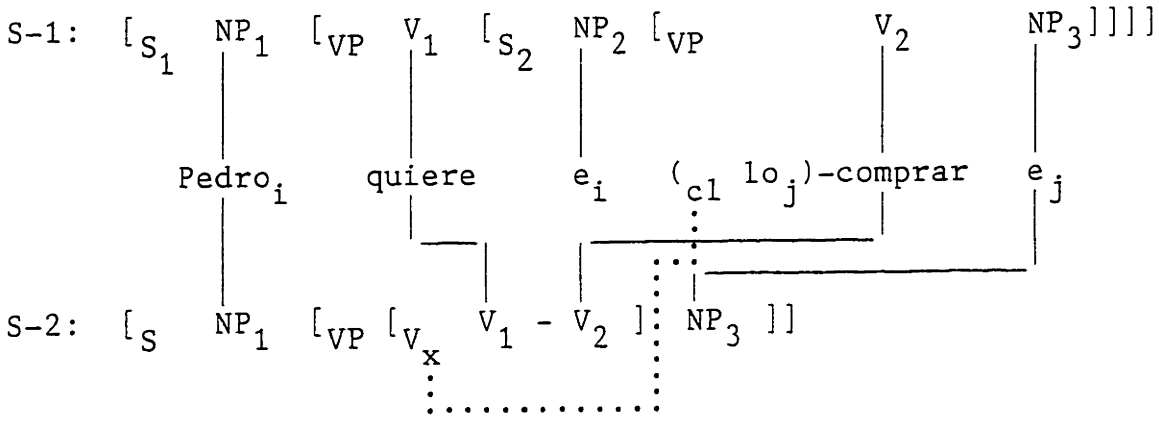
b. S-2: $[_{S}\ NP_1\ [_{VP}\ [_{V}\ V_{affix} + V]\ NP_3\ ]]$

In (26) poder is both an argument-taking predicate (it assigns an argument θ role to S_2) and it is a verbal affix which modifies the verb visitar.

With this approach to the Restructuring process, Zubizarreta argues that clitic-climbing is equal to clitic-percolation. "Clitics are generated on the verb which functions as head of the verbal complex. They percolate up to the V node projection of the verbal head" (Zubizarreta 1982:174).

Consider (27) as an illustration[5]:

(27) Pedro lo quiere comprar
('Peter cl wants to buy')



In (27) the clitic lo is generated on the verb comprar, and then it percolates up to V_x.

This brief outline of the restructuring process is sufficient for our problem. The question we wish to address is what is the fate of the empty element e_i under NP_2 in the structure S-1, once restructuring has applied. To this effect we intend to apply the OPC as a diagnostic for the existence/non-existence of such empty category in the restructured structure S-2.

2.2 OPC effects in Restructuring configurations.

Consider the following sentence:

(28) Muchos estudiantes van a convencerlo de que ellos son inteligentes

('Many students are going to convince-him that they are intelligent')

The overt pronoun ellos ('they') in (28) can be interpreted as a bound variable, suggesting that the structure of (28) is (29), with the linkings shown:

(29) [Muchos estudiantes] [t] van a [PRO] convencerlo de que [ellos] son inteligentes

It is easy to see in (29) how the overt pronoun ends up as a bound variable: it is linked to a bound pronominal (PRO), which is bound by virtue of being linked to the formal variable t, the QR-trace of muchos estudiantes. (ellos, PRO) form a P-chain.

Notice furthermore that we can assume (perhaps must) that both verbs are main verbs, in particular that van is a main verb. Notice furthermore that the clitic lo is 'downstairs', attached to the second verb, convencer.

Compare now (28) with (30):

(30) Muchos estudiantes lo van a convencer de que ellos son inteligentes

('Many students him are going to convince that they are intelligent')

which is identical to (28) save for the fact that the clitic is now attached to the upper verb. here in (30) the overt pronoun ellos ('they') cannot be interpreted as a bound variable. We reason that the difference between (28) and (30) is due to the OPC plus the restructuring process.

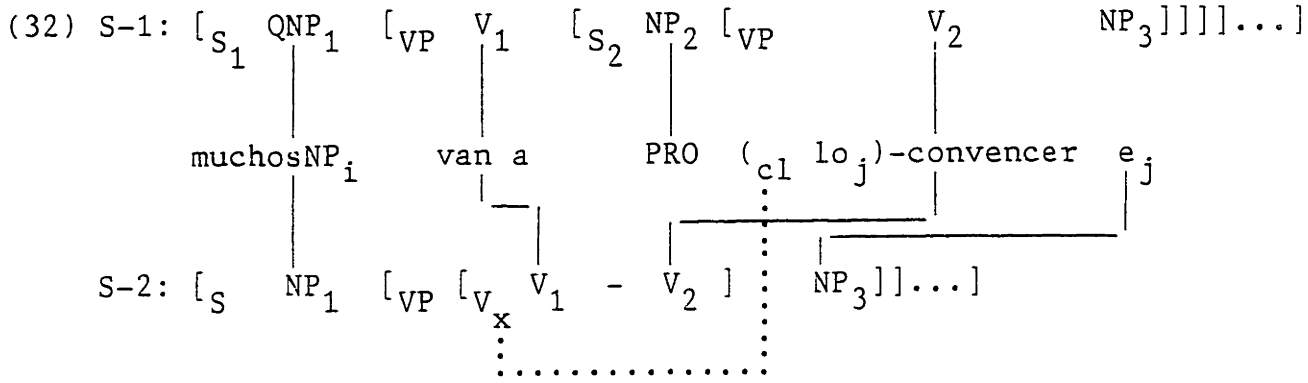
Let us consider (30) more carefully. The clitic lo which appeared attached to the second verb in (28) is now attached to the first verb in (30). The clitic climbing (or clitic-percolation) process is related to restructuring in the sense that the percolation can be effectively realized if we assume the formation of a verbal complex from the two verbs, assigning to the first the quality of an affix. the result is that a bisentential structure has become a single sentence. But now, if van a convencer is just one complex verb, then the PRO Subject of convencer dissapears in (30), as was the case with Zubizarreta's S-2 structures.

This suggests that the structure of (30) is (31):

(31) [Muchos estudiantes] [t] lo [van a convencer] de que
↑_| ↑
| *
| [ellos] son inteligentes
|____|

Notice that, not being a PRO available for ellos to link to, if the overt pronoun links to t (as shown in (31)) this linking constitutes a violation of the OPC. This in turn gives us the correct results. ellos can be bound in (28) because (as shown in (29)) it can link to a bound pronominal which in turn is linked to a formal variable. But ellos cannot be bound in (30) because the restructuring process has 'deleted' the intermediate bound pronominal, and so the overt pronoun cannot be bound because its only route to the formal variable is now a direct one, one which is blocked by the OPC (as shown in (31)).

These results seem to constitute a problem for Zubizarreta's account. In fact, consider the parallel-structure analysis of (30):



(where "...]" indicates that the rest is the same in S-1, S-2).

Notice that (28) will have the same parallel structure analysis as (30) (i.e. (32)) only that clitic-percolation takes place in (28) but not in (30). But then, if both (28),(30) have dual structures, why does the difference obtain (i.e., the difference in terms

of the interpretive behavior of the overt pronoun). Indeed, it looks as if in (28) the relevant structure is S-1 (the unrestructured one), but for (30) the relevant structure seems to be S-2, the restructured one.

Furthermore, Zubizarreta observes that "At each syntactic level: D-S, S-S, and LF, these sentences may be associated with a pair of structures. And, it is the "reduced" structure (S-2) which is mapped onto PF" (Zubizarreta 1982:161-2). This means then that both structures (the reduced and the unreduced) will be present at LF. How then can we discribe the contrast observed between (28) and (30). I have no solution to this riddle for the moment[6].

Be it as it may, the OPC seems to show rather clearly that (perhaps following Rizzi) the difference between sentences like (28) and (30) is not solely a difference in the linear occurrence of the clitic, but also a radical difference in structure. The difference is clearly the following: in sentences like (30) the structure seems to be that of a single sentence, hence, without a PRO Subject of the second verb, while in (28) the structure seems to be bisentential, with a PRO element.

Similar contrasts can be found in the following pairs:

(33) a. [Nadie] [t] va a [PRO] convencerlo de que [él] es tonto
↑_| ↑_____| ↑_____|

('Nobody is going to convince-him that he is dumb')

b. [Nadie] [t] lo [va a convencer] de que [él] es tonto
↑_| ↑_____*_____|

(34) a. [Quién] [t] va a [PRO] convencerlo de que [él] es tonto
↑_| ↑_____| ↑_____|

('Who is going to convince-him that he is dumb')

b. [Quién] [t] lo [va a convencer] de que [él] es tonto
↑_| ↑_____*_____|

Here again, the difference in interpretive behavior between the a and b sentences can be attributed to the OPC, once we assume the relevant structures for these sentences.

3. Empty Operator Binding phenomena.

A third case for which the OPC diagnostic can be put advantageously to use are structures containing empty operators binding empty elements. In this section we will review two of these structures and will apply the OPC to figure out the nature of the empty category involved.

Consider first the case of parasitic gap constructions. Consider the following well known example as illustration:

(35) Which papers did you file e_1 without reading e_2

Following Chomsky's first approach to these structures (cf. Chomsky 1982), the core set of properties involved in parasitic gap constructions can be stated as follows: (i) the operator c-commands both gaps; and (ii) the 'real' gap doesn't c-command the parasitic one, nor the latter the former. Under this approach, the operator

is indeed binding two elements (e_1, e_2). Notice furthermore that under our definition of formal variables, both gaps will be characterized as such: both are empty elements in argument positions linked to a lexical operator in a non-argument position. Consequently, if this approach is correct, and the parasitic gap (e_2) is characterized as a formal variable, we should expect that it cannot 'license' the bound interpretation of a following overt pronoun.

Consider for example the following structure

(36) [A quiénes] contrató [t] el director sin persuadir [e]
de que [ellos] viajen a Lima

('Who did the director hire t without persuading e that they should travel to Lima')

If e is a formal variable, then the link (ellos,e) should be starred, and the overt pronoun should not be able to be interprted as a bound pronoun.

But this prediction is incorrect. The overt pronoun ellos ('they') in (36) can be interprted as a bound variable. Query: how did the overt pronoun get bound?

Notice, incidentally, that linking the overt pronoun to t, only repeats the problem, because t is also a formal variable. Hence, if both gaps are formal variables, and if there is no other pronominal around[7] we are left with no explanation for the bound interpretation

of the overt pronoun in (36).

There is an inelegant (and eventually incorrect) way out, if we want to keep Chomsky's (1982) approach to parasitic gap structures. Recall that under this approach, parasitic gaps are regarded as pronominals at D-structure, given the functional characterization of empty categories. The parasitic gap then changes status in the course of the derivation and ends up being a variable (a formal variable) at S-structure and at LF. Given the fact that it is impossible to assume that the OPC applies at D-structure, we are then forced to assume that the parasitic gap is still a pronominal at LF (but also a formal variable). The problem is that there is no place in our system for a pronominal formal variable, given that we have been assuming that pronominals are never linked to non-argument positions[8]. Consequently we find no way to reconcile Chomsky's (1982) approach to these structures with the bound interpretation of the overt pronoun in (36).

Chomsky's second approach to parasitic gap constructions (class lectures, Fall 1983) offers however some new insight into our problem. Under this approach, parasitic gap structures will look like (37a) instead of (37b) which illustrates the first approach:

(37) a. [O [... [t]] [Ø [... [e]]
|__|

b. [O [... [t] ... [e]]

(where O is an overt operator, t the real gap, Ø an empty operator,

and e the parasitic gap).

In (37a) (O,t) form a chain, and so do (Ø,e). Both chains are then hooked up (possibly by a rule of predication). Notice that under this chain-composition approach the parasitic gap is not bound by the overt operator (O), but by an empty operator (Ø). The difference in structure for parasitic gap constructions is thus quite radical as (37a, b) show. It is precisely this difference that will allow us to solve our problem.

Indeed, recall that our definition of formal variables (cf.(34) in Chapter 2) stated that an empty category in argument position was a formal variable if linked to an overt operator in a non-argument position. Consequently, the parasitic gap in (37a) is not a formal variable because its binder is not lexical. If so, then the linking from an overt pronoun to the parasitic gap does not constitute a violation of the OPC.

The structure of (36) is thus (38):

(38) [A quiénes] contrató [t] el director sin [Ø] persuadir [e]
↑_____| ↑_____| ↑
↑_____|
de que [ellos] viajen a Lima
_____|

The overt pronoun ellos ('they') derives its bound nature by virtue of being linked to the parasitic gap (which, as stated, is not a formal variable), which in turn is bound by the empty operator Ø. The chain composition process will then hook up both chains: (a quiénes, t) and (Ø, e, ellos). Thus the riddle is solved: parasitic gaps can

license the bound interpretation of overt pronouns because they are not construed as formal variables.

At a first glance it might seem ad-hoc to assume that empty operators are not real operators with respect to the characterization of formal variables. The study of a second construction should help to dismiss this feeling. Indeed, a second construction relevant to our analyses has also been assumed to contain an empty category bound by an empty operator: Tough constructions.

Consider the standard structure for the following standard example:

(39) John is easy [Ø [PRO to please e]]

In these constructions we can also test OPC effects. If our assumption was correct, that is, if empty operators don't make formal variables, then the empty category in (39) (e) is not a formal variable, and thus an overt pronoun should be able to link to it. Consider the following example:

(40) [Muchos estudiantes] son fáciles de [Ø] PRO convencer [e]

de que [ellos] viajen a Lima

And indeed, the overt pronoun ellos ('they') can be interpreted as a bound variable, thus arguing for the non formal variable nature of the empty category Object of convencer.

Furthermore, it is a well known fact that the empty category in Tough constructions can license a parasitic gap. Consequently, we can combine the results of the two structures under study to produce the following configuration in which the overt pronoun can be bound:

(41) [Muchos estudiantes] son fáciles de [Ø] PRO convencer [e]
↑_____|

sin [Ø] PRO persuadir [e] de que [ellos] viajen a Lima
↑_____| ↑_____|

('Many students are easy to convince without persuading that they should travel to Lima')

Thus, the OPC diagnostic supports the chain-composition approach to parasitic gap constructions quite straightforwardly. It is only under this approach that overt pronouns (which may be interpreted as bound variables in these configurations) can find a suitable element to link to and thus acquire variablehood. Notice again that the crucial property in these constructions is the presence of an empty operator binding the empty category that will eventually license the bound interpretation of an overt pronoun.

4. A note on two related phenomena.

In certain constructions, pronouns linked to non quantificational NPs can be ambiguous between a coreferential and a bound reading. Consider for example:

(42) [John] thinks that [he] killed a vampire and so does Luc

(42) can be interpreted as either (43a, b):

(43) a. John thinks that John killed a vampire and Luc thinks that John killed a vampire

b. John thinks that John killed a vampire and Luc thinks that Luc killed a vampire

(43b) constitutes what Ross (1967) called the sloppy identity reading [9]. To obtain this reading we must assume that that the first conjunct of (42) contains an open sentence of the form x thinks that x killed a vampire, which is satisfied by John in the first conjunct and by Luc in the second. That is, some form of a variable binding process is taking place in order to obtain such reading.

(43a) on the other hand can be explained on purely coreferential grounds. The reference of the pronoun he (in 42)) is fixed by assigning to it the value John, which is carried on to the second conjunct.

Of course, if no linking obtains in (42) that relates the pronoun to an antecedent, then the pronoun is free: both John and Luc think that somebody else, a third person, killed the vampire[10].

Consider next the behavior of overt and empty pronouns in these constructions:

(44) a. [Juan] cree que [él] mató al vampiro y Luc también

('John believes that he killed the vampire and Luc (does) too')

b. [Juan] cree que [pro] mató al vampiro y Luc también

In (44a) an overt pronoun, él ('he') occurs, and in (44b) an empty one, pro. Both sentences can be interpreted in the non-sloppy manner, but only (44b) can be interpreted in the sloppy identity reading. That is, only the sentence containing the empty pronoun can be interpreted in the sloppy way.

Consider however the following sentence:

(45) [Juan] dijo que [pro] cree que [él] mató al vampiro y Luc también

('John said that pro believes that he killed the vampire and Luc (did) too')

Here, a sloppy reading is also available, namely, Luc says that Luc believes that Luc killed the vampire.

Furthermore, consider (46):

(46) [Juan] dijo que [[su] hermano] mató al vampiro y Luc también

('John said that his brother killed the vampire and Luc (did) too')

The behavior of overt and empty pronouns in these constructions recalls familiar OPC effects, even though there is no apparent formal variable triggering the effect. Indeed, in the examples under (44) only the sentence containing an empty pronoun in the first conjunct could be interpreted in the sloppy way, not the one containing the overt pronoun. If some sort of variable binding is taking place in these constructions then, it is no surprise that the empty form acts as a variable but not the overt one. However, when the overt pronoun can find an intermediate empty form, the sloppy reading is available for the second conjunct, as example (45) shows. Furthermore, if the overt pronoun does not alternate with the empty one, sloppy reading is again available, as example (46) shows. All these facts form part of the core set of properties that has been studied in this thesis concerning the difference in interpretive behavior between overt and empty pronouns.

The conclusion thus seems to be a very general one. Overt pronouns may act as bound variables only if their variablehood is somehow licensed by an empty pronominal (or if no alternation obtains).

Practically all the properties observed about the behavior of overt and empty pronouns obtain in sloppy identity constructions. As a final illustration, consider the case of backwards linking, similar to example (59) in Chapter 3:

(47) [Juan] pensó que las fotos que [él] tomó probarán

que [pro] estuvo ahí y Luc también

('John thought that the pictures he took will prove that he was there, and Luc (did) too').

(47) can be interpreted in the sloppy way, but not (48):

(48) [Juan] pensó que las fotos que [él] tomó probarán

que [él] estuvo ahí y Luc también

In (48) both pronouns are overt, hence, following the expected behavior, no sloppy identity reading obtains. Of course, the coreferential (non-sloppy) reading is still available.

In (47) on the other hand, pro can act as a variable, and thus backwards linking allows the overt pronoun to be linked to the empty one instead of to the matrix Subject. In this configuration, the overt pronoun can be 'bound', and the sloppy reading arises.

A second case related to the OPC is that of overlapping reference, which we will just briefly mention. Consider the following sentence:

(49) [Who] [t] thinks that [we] will fight
↑_| ↑_____|

The question here is whether (49) can mean (50):

(50) (Which x: x a person) x thinks that x and I will fight

where an appropiate answer to the question must have the form: "Peter thinks that Peter and I will fight, John thinks that John and I will fight, etc. ...". Judgements seem to differ in English with respect of the availability of this reading for (49).

Consider the Spanish equivalent of (49) in its two forms, with an overt pronoun (51a) and with an empty one (51b):

(51) a. [Quién] [t] cree que [nosotros] pelearemos
↑_| ↑____*____|

b. [Quién] [t] cree que [pro] pelearemos
↑_| ↑_____|

In Spanish the judgements are quite straightforward. (51a) cannot mean (50), but (51b) can (in fact, (50) is the first reading that comes to mind).

The link (nosotros, t) is starred anyway by the OPC, since t is a formal variable. However, as seen before, if an intermediate bound pronoun occurs, the overt pronoun can be interpreted as the empty is. Consider two cases:

(52) a. [Quién] [t] quiere [PRO] creer que [nosotros] pelearemos
↑_| ↑_____| ↑_____|

('Who wants PRO to believe that we will fight')

b. [Quién] [t] cree que [pro] pelearemos si [nosotros]
↑_| ↑_____| ↑_____|
nos encontramos

('Who believes that pro will fight if we meet')

In (52a) PRO and in (52b) pro are gates for the interpretation of the overt pronoun in these cases of referential overlap. This seems to be a phenomenon directly related to the OPC.

FOOTNOTES: Chapter 4.

1. An exploratory note on the identification of empty categories.

We have assumed with Borer (1984b) that empty categories have no intrinsic features, and that empty categories must be I-identified, where the process of I-identification can be understood as the assignment of i-features (Person, gender, number,...) by an identifier to the empty category.

At least pre-theoretically there is a tempting analogy between the process of assigning i-features (say, to an element α in a structure Σ), and the process of extracting (α from Σ). In other words I would like to explore briefly the possibility that to assign and to extract can be taken as mirror processes of (perhaps) the same, or similar, phenomenon. Within a GB framework the successful extraction of an element α from a structure Σ is, as is well known, constrained by the cluster of properties associated to the rule Move- α(e.g., Subjacency, θ theory, etc.). The question that I would like to explore briefly in this footnote is whether the constraints on extraction (or some version of them) play any role in establishing the conditions on assignment of i-features.

As a starting point consider a class of structures that seem to be (perhaps) universally ill-formed:

(i) *[...[$_{NP}$ [$_{NP}$ e] 'and' [$_{NP}$ e]]...]

That is, the conjunction of two (or more) empty categories renders a structure ungrammatical, for any value of [e]: PRO, pro, WH-trace, NP-trace,... or any other empty curiosity known to date.

Here, I will limit my concern to the pronominal options PRO, pro. Consequently, (iia, b) are out:

(ii) a. *[[PRO] and [PRO]] to eat pumpkins is dangerous
b. *[[pro] y [pro]] comieron zapallos
[ ] ate+INFL pumpkins

In principle there are various ways to deal with these examples. I will consider some of them in turn and then suggest what is possibly a more appropiate approach.

Consider (iia) first. Suppose (a) that PRO is ungoverned (i.e. the PRO Theorem), and (b) that and is a governor (for the moment just a stipulation). If so, the ungrammaticality of (iia) follows strightforwardly. However, something must be said regarding the structure of coordinate configurations. Essentially two have been proposed in the literature:

(iii) Chomsky (1957), Dougherty (1968):
$[_{NP_1} NP_2$ 'and' $NP_3]$

(iv) Ross (1967), Gazdar (1981):
$[_{NP_1} NP_2 [_X$ 'and' $NP_3]]$

(I will leave aside Williams' (1978) ATB analysis. For our present purposes it can be regarded as equivalent to (iii)).

Note that if we choose (iv) only NP_3 will be governed; in (iii) on the other hand both NP_2, NP_3, will be governed (assuming that and is a governor). For the momemt this doesn't seem to make a difference. Consider (v):

(v) $[_{NP}$ PRO $[_X$ 'and' W]]

PRO will be safely ungoverned in (v). W, however, will be governed by and. So, if W=PRO, it will be out, and if W=lexical, it will also be out, only this time because it will lack Case (recall that we are dealing with examples like (iia) were the verb is [-tense]). A third possibility, namely, that W=pro, can again be ruled out if we assume that pro needs Case (a controversial assumption nevertheless). We will return to this case later.

Consider (iib) now. Clearly the analysis for (iia) cannot be made extensive to (iib), if we assume that pro occurs in governed

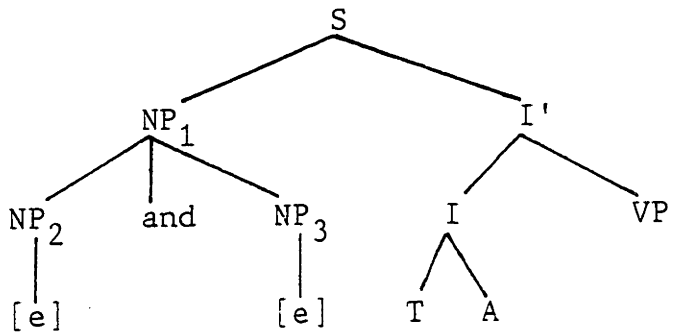
positions. Suppose then that (iib) is ungrammatical because something went wrong with the identification of the empty categories involved. One of two things could have gone wrong: either they were misidentified or they weren't identified at all.

Consider first the case in which they were misidentified. A couple of assumptions must be set forth in order to deal with this possibility:

(vi) a. INFL's i-features percolate down
b. if INFL contains a set F of i-features, then F is assigned to each conjunct

Take then a structure like (vii):

(vii)



(where T=tense, and A=Agreement).

(via) says that INFL assigns i-features to NP_1 and then those features percolate down to NP_2, NP_3 (in a way probably equivalent to that in which Case is assigned in such structures). (vib) says that if INFL contains a set F os i-features, the INFL assigns (via (via)) F to NP_2, NP_3. Now consider sentence (iib) again:

(iib) $[_{NP_1}\ [_{NP_2}$ pro] y $[_{NP_3}$ pro]] comieron zapallos
[ ] ate+INFL pumpkins

where F=[3rd person, plural]. Following (via) NP_2=[3rd person, plu-

ral], and NP_3=[3rd person, plural]. Under the approach we are exploring, one might say that (iib) is ungrammatical because the parallel sentence with overt pronouns is also ungrammatical:

(viii) *[Ellos y ellos] comieron zapallos
[They-masc and they-masc] ate+INFL pumpkins

(leaving aside a reading with deitic force). Notice however that (ix) is acceptable:

(ix) [Ellos y ellas] comieron zapallos
[They-masc and they-fem] ate+INFL pumpkins

Crucially, in Spanish, among the features that constitute the set F of i-features of INFL, there is no Gender feature. hence, a simple null Subject senetnce like (x)

(x) [e] compró una brújula
[e] bought a compass

can be interpreted as containing either a masculine or feminine Subject (he or she). In principle then, there is nothing awkward in interpreting (iib) as (ix). hence, (iib) should be perfectly grammatical (but it isn't). Therefore, in order to make the account we are considering work, we must add, to the two assumptions given in (vi) a third one that states that in coordinate structures we must interpret both pro's as if they had the same i-matrix, including in such matrix, a choice for Gender (which, not INFL, but presumably the speaker selects). This doesn't seem to be a plausible analysis of the ungrammaticality of (iib).

I will suggest that (iib) is out because the empty categories involved were not identified at all.

First, let us distinguish the two processes in which INFL is involved: the process of assigning i-features, and the process of

checking agreement. This later checking process refers to the operation by which sentences like The flowers is beautiful are ungrammatical. We assume that if INFL assigns i-features then the checking process is vacuous, and we won't consider it in what follows.

Particular languages can be classified in terms of having or not having these processes. E.g., a Null Subject language has both processes: INFL assigns i-features if the Subject is empty, and INFL checks agreement if the Subject is lexical. In principle the full range of possibilities expressed in (xi) should be available cross-linguistically:

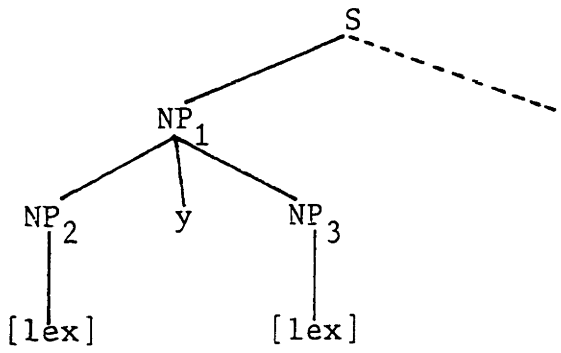
(xi)

	Assigning process	Checking process
Type I :	+	+
Type II :	+	-
Type III:	-	+
Type IV :	-	-

Spanish, Italian, are examples of a language of Type I. English illustrates a language belonging to Type II: INFL isn't rich enough to assign i-features, but the checking process is still on. Japanese, Chinese, illustrate a language of Type IV: INFL is non existent so it can't either assign or check features. And finally Irish seems to be a good candidate for Type II: in Irish if INFL is rich enough then pro-drop is obligatory, but if non-inflected forms are used (in verbs, prepositions) then pro-drop is impossible.

At least for Type I languages, it seems reasonable to assume that INFL assigns i-features to the nP with which INFL would have checked agreement if the NP was lexical. In coordinate structures agreement is checked with NP_1 in (xii):

(xii)



The features on NP_1 (which are to be checked with those of INFL] are compositionally assigned by NP_2, NP_3 by a rather simple algorithm I will not discuss here. Suppose however that NP_2, NP_3 were null; then assignment, not checking, ought to take place. But if INFL assigns i-features to the NP it would have checked agreement with (if the NP were lexical) then NP_1 (and not NP_2, NP_3) will be assigned features. Hence, NP_2, NP_3 will not be i-identified, and the structures will be ruled out. We have to assume, however, that once the assignment of i-features is made to NP_1, these features do not percolate down to NP_2, NP_3. Consequently, the account we are now considering relies on two assumptions:

(xiii) a. (The intuitive idea that) INFL assigns i-features to the nP it would have checked agreement with if the NP were lexical.

b. (The stipulation that) i-features do not percolate down.

In a way, both assumptions are closely related. (xiiib) however, requires some explanation: why shouldn't i-features percolate down?

Suppose, as was suggested at the begining of this footnote, that we view the processes of assignment and extraction as two sides of the same coin, the intuitive idea being that to assign seems to mirror to extract. In fact, in terms of the design of a model of grammar, it would be optimal if both processes could be related in some way. I will argue that the best way to look at the relation

between these two processes is to examine the constraints that come into play in each case. The ultimate goal, of course, will be to regard assignment as a special instance of Move- α .

Suppose then that the assignment of i-features is subject to Subjacency as follows.

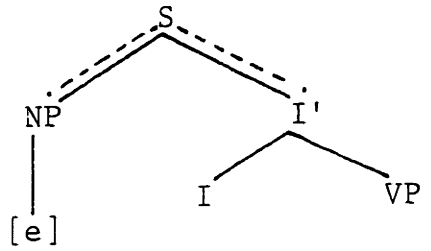
[What follows assumes a somewhat heretic version of Path theory (cf. Pesetsky 1982). The path between INFL and NP that I will be using is probably an A-path, the nature of which is left open by Pesetsky (op. cit.) who observes that the PCC operates only on $\bar{A}$-paths. For the moment, then, I will use paths as mere representational devices on which I will discuss assignment constraints.]

Assume there is a path between INFL and the NP it assigns i-features to. Sentence (xiv) will then have a path like the one shown in (xv):

(xiv) [e] comieron zapallos
[e] ate+INFL pumpkins

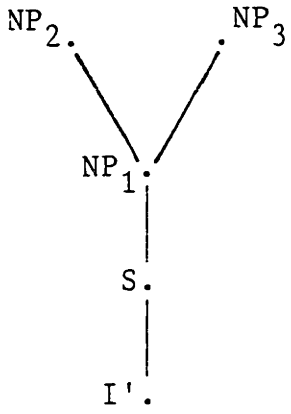
(xv) NP.
|
S:
|
I'.

from:



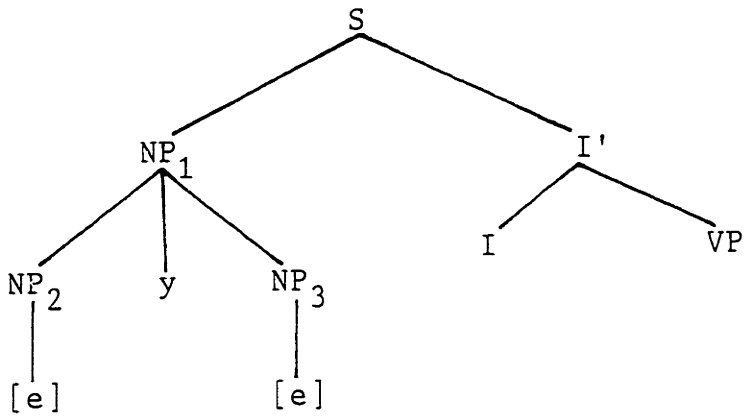
Although irrelevant to our present discussion I will assume that I' is one of the endpoints of the path. Suppose furthermore that (NP,S) are bounding nodes. hence, no path connecting INFL with an NP can go through more than 1 bounding node. (xvi) will then be an ill-formed path, or if you will, NP_2 will not be path-subjacent to INFL:

(xvi)



(xvi) is precisely the path that must be drawn for the assignment of i-features by INFL to the conjuncts of a coordinate structure, like in (xvii):

(xvii)



Hence, structures like (xvii) will be ruled out because, not being path-subjacent to INFL, NP_2 and NP_3 will not be identified and consequently will fail to comply to the assumption that all empty categories must be i-identified.

Let us thus state the conditions on i-assignment by INFL in the following terms:

(xviii) a. INFL must be path-subjacent to the NP it assigns i-features to.

b. NP, S are bounding nodes.

With this in mind we can return to the question of conjoining PROs. Two possibilities are open: either ARB is a feature to be assigned by INFL when INFL is [-tense], or an empty operator identifies PRO. In either case the path-subjacent requirement must hold. Notice that the conjunction of PROs will be ruled out in either case.

2. This is a case of clitic doubling. Doubling is obligatory in examples like (9b) when the Object is pronominal.

3. Of course, if we assume, say, following Jaeggli (1982), that e in (17) is ungoverned because the clitic absorbs government, then it is viable to assume that e = PRO. In any case, our analysis holds: e cannot be a formal variable.

4. Example taken from Zubizarreta (1982:161 (75))

5. This example is a simplified version of Zubizarreta's example (92) p.175.

6. One possible way out is the following. We can mantain the dual structure approach if we assume that even though both structures are present at every level of representation, the restructured one is taken to be the relevant one if some process has crucially triggered it, in our case, clitic-climbing. This would actually capture Rizzi's original intuition that in the presence of certain processes the reduced structure is fed to, e.g., LF, but would also mantain Zubizarreta's solution to the Projection Principle problem.

7. The PRO Subject of persuadir doesn't play a role in the relevant linking relations.

8. But cf. Cinque (1983) and the existence of $\bar{A}$-bound pro.

9. cf. also Sag (1976), Williams (1977), Reinhart (1983).

10. A question arises here: if the pronoun is free and hence refers to a third person, must the third person be the same for John and Luc? It seems that it must.

CHAPTER 5

CONCLUSIONS

In this chapter I will review some of the issues raised in the preceeding chapters in order to present a general overview of the matters discussed in this thesis.

In Chapter 2 we presented a Linking theory of Binding, following quite closely Higginbotham's (1983a, 1983b) proposal to describe antecedence relations in syntax. We reviewed the formal properties of linking and showed how linking interacts with other principles of grammar. Furthermore, we concluded that a linking theory of binding had empirical advantages over a coindexing theory of binding. To this effect we reviewed Higginbotham's arguments concerning the problems of split antecedents and circular constructions, and we included an argument of our own that shows that directionality is still a relevant notion in non c-command domains. This gave rise to a discussion on backwards linking which proved to be extremely useful in following chapters.

We also defined (in Chapter 2) one of the crucial notions of this thesis, namely, that of formal variable, and we introduced the concept of Pronoun chain (P-chain) to deal with cases of pronominal binding in which more than one pronoun was involved. Here again, we showed that c-command is not a relevant requirement for the construc-

tion of P-chains.

In section 5 (Chapter 2) we suggested a simplification of linking theory. This simplification had the effect of characterizing linking as free (i.e., it applies freely). This simplification seems possible thanks to the close interaction between linking and other principles of grammar. We also included an extension of linking theory, by suggesting the creation of what we called L-sets, which describe antecedence relations distinguishing binding from coreferential readings.

In Chapter 3 we introduce the Overt Pronoun Constraint (OPC) to describe the differences in interpretive behavior between overt and empty pronouns ,in particular in configurations that involve binding phenomena. The OPC was stated in terms of formal variables, namely, blocking a link from an overt pronoun to a formal variable (iff the overt pronoun was in contrastive distribution with an empty one).

One of the more interesting properties of the OPC is that, although it blocks the linking of overt pronouns to formal variables, formal variables can be antecedents for overt pronouns if the relation between the overt pronoun and the formal variable is mediated by an empty pronominal. This property in turn gives empirical support to the existence of empty categories, because otherwise, the contrasts observed throughout this thesis, would remain unintelligible.

Indeed, the OPC serves as a rather strong diagnostic for (a) the existence, and (b) the nature of empty categories. We concluded that

fully relates them to ongoing research on the nature and properties of UG. Following this chapter, we include an Appendix that deals with some parametric variations observed across languages with respect to the OPC. Evidence from Japanese, Catalan, Portuguese, and Chinese, suggests that the OPC should be parametrized to describe the behavior of overt pronouns in these languages. It is interesting to note, incidentally, that linking theory provides a rather natural characterization of these parametric variations.

One question remains, perhaps the hardest: why do OPC effects exist? Why do overt and empty pronouns behave differently?

There is always a functional answer available: if you have two types of pronouns then do one thing with one and another with the other. Although not implausible, this is hardly a satisfying answer.

Rizzi (p.c.) suggests a different way to look at this problem (one which ought to be explored with more attention than the one I will give here). Indeed, suppose that overt pronouns are actually in Topic position. For the moment let us concentrate in pronouns that we have analyzed as appearing in the [NP,S] position.

Rizzi observes that (1a) is better than (1b):

(1) a. [Nessuno] [t] pensa que la televisione parlerá di [lui]
↑_| ↑_____|

('Nobody thinks that the television will speak of him')

b. [Nessuno] [t] pensa que di [lui] parlerá la televisione
↑_| ↑___?/*_____|

The fact that (1a) is good with the linkings shown is not surprising, given that the OPC appears to operate in Italian as in Spanish[1]. Indeed, the overt pronoun lui occurs in a position in which an empty pronoun cannot appear. Hence, the OPC doesn't apply, and a bound reading is available. (1b) is worse than (1a) in the intended reading. Notice that the pronoun appears in Topic in (1b).

The same contrast can be found in Spanish:

(2) a. [Nadie] [t] piensa que la televisión hablará de [él]
↑_| ↑_____|

b. [Nadie] [t] piensa que de [él] hablará la televisión[2]
↑_| ↑_____*/?_____|

If overt pronouns may appear in Topic position, then the OPC must be reformulated in the following terms: an overt pronoun in TOP cannot link to a formal variable. Indeed, we can drop the specification to overt pronouns since it is hard to imagine empty pronouns in such positions. But notice then that if this is true, we are left with no explanation for the alternation patterns required in our formulation of the OPC, which by the way, seemed to play an important role.

It is interesting however to notice that when a pronoun is topicalized, it can't be bound even if an intermediate pro appears. Consider the following example:

(3) [Nadie] [t] me ha dicho que [pro] cree que [a él] lo puedo
↑_| ↑_____| ↑____*____|

ayudar

('Nobody has told me that pro believes that him I can help')

If the TOP analysis of overt pronouns can be carried out successfully, then we have the beginings of an explanation for why OPC effects are present in these constructions[3].

FOOTNOTES: Chapter 5

1. Here I am endebted to L.Rizzi, G.Cinque, and A.Belletti.

2. But cf. Chapter 3, section 8. (2b) might be related to the fact that inverted Subjects can't be bound in Spanish. As we noted there, in Italian this is not the case. This difference might account for why (1b) is perhaps better than (2b).

3. Furthermore, if the suggestion we have briefly explored is viable, one might want to treat the empty categories related to clitics as in Hurtado (1983).

APPENDIX

In Chapter 3 we proposed the Overt Pronoun Constraint (OPC) in order to describe the differences in interpretive behavior between overt and empty pronouns, in certain configurations that involved binding phenomena. The OPC was formulated there in (34) which I will repeat here as (1):

(1) Overt Pronoun Constraint (OPC).

Overt pronouns cannot link to formal variables iff the alternation overt/empty obtains.

So far, the application of the OPC has been circumscribed to Spanish, but there is reason to believe that it should apply in any language in which overt and empty pronouns are in contrastive distribution[1].

We will concerned here with certain languages whose overt pronouns behave as predicted by the OPC, but which exhibit certain other peculiarities at the same time. Our goal is to prepare the terrain for a parametric discussion of the OPC. To this effect we will concentrate our attention on languages like Japanese, Chinese, Catalan, and Portuguese. In these languages, the 'general intuition' behind the OPC works, although, as we shall see, some adjustments must be made. This 'adjustments' can be characterized as parametric variations .

Consider first the case of Japanese[2]. In Japanese we observe a contrast in the following pair:

(2) a. Daremo-ga [$_{\bar{S}}$ kare-ga atama-ga ii to] omotte iru
Everyone-nom he-nom be-smart COMP think
('Everyone thinks that he is smart')

b. Daremo-ga [$_{\bar{S}}$ [e] atama-ga ii to] omotte iru

(2a) is ungrammatical if the overt pronoun kare is interpreted as bound by the quantifier daremo ('everyone'). However, (2b) is perfectly grammatical with the empty pronoun e interpreted as a bound variable (bound by the quantifier expression daremo). In other words (2a) cannot mean (3) although (2b) can:

(3) (Every x: x a person) x thinks x is intelligent

Here, it seems as though we are confronted with a direct OPC effect: the overt pronoun can't be bound, but the empty one can[3].

Notice furthermore that, as in Spanish, deepness of embedding doesn't save the construction:

(4) Daremo-ga [$_{\bar{S}}$ kare-ga atawa-ga ii to] Mary-ga itta
Everyone-nom he-nom be-smart COMP Mary-nom said
to omotte iru
COMP think
('Everyone thinks that Mary said that he is smart')

The same contrast can be found in questions. Consider the following examples:

(5) a. Dare-ga [$_{\bar{S}}$ kare-ga atama-ga ii to] omotte iru no
Who-nom he-nom be-smart COMP think Q

('Who thinks that he is smart')

b. Dare-ga [$_{\bar{S}}$ [e] atama-ga ii to] omotte iru no

Here again (5a) cannot be interpreted with the overt pronoun kare understood as bound by dare ('who'). That is, (5a) cannot mean (6):

(6) (Which x: x a person) x thinks that x is smart

However, (5b), which contains an empty pronoun can perfectly mean (6).

Consider next cases with the alternation in Object position. First a non-quantificational antecedent case will be shown to test coreferential possibilities:

(7) John-ga [$_{\bar{S}}$ Mary-ga [e] tazunete kuru daroo to]
John-nom Mary-nom e come-to-see will COMP

omotte iru
think

('John thinks that Mary will come to see e')

Consider now the quantificational cases:

(8) a. Daremo-ga [$_{\bar{S}}$ Mary-ga kare-o tazunete kuru daroo to]
Everyone-nom Mary-nom he-acc come-to-see will COMP

omotte iru
think

('Everyone thinks that Mary will come to see him')

b. Daremo-ga [$_{\bar{S}}$ Mary-ga [e] tazunete kuru daroo to]

omotte iru

(8b) can be interpreted as containing a bound pronoun e, but not (8a) which contains an overt pronoun kare.

These examples seem to show that the OPC applies straightforwardly in Japanese: overt pronouns can't be bound, but empty ones can. Further confirmation comes from sloppy identity constructions like the following:

(9) a. John-wa [$_{\bar{S}}$ Mary-ga kare-o tazunete kuru daroo to]
John-TOP Mary-nom he-acc come-to-see will COMP

omotte iru, Bill-mo soo omotte iru
think Bill-also so think

('John thinks that Mary will come to see him, and Bill does too')

b. John-wa [$_{\overline{S}}$ Mary-ga [e] tazunete kuru daroo to]

omotte iru, Bill-mo soo omotte iru

(9a) which contains the overt pronoun kare cannot be interpreted in the sloppy way, but (9b) which contains the empty pronoun e, can. Again, these results are exactly like those shown for Spanish; results which we attributed (indirectly) to the OPC.

However, different from Spanish, Japanese overt pronouns cannot be bound even if an intermediate bound pro appears in the construction. Consider the following sentence:

(10) Daremo-ga [$_{\overline{S}}$ kare-ga atawa-ga ii to] [e] itta
Everyone-nom he-nom be-smart COMP e said

to omotte iru
COMP think

('Everyone thinks that [e] said that he is smart')

Here, the overt pronoun kare still can't be bound. Recall that in these type of structures, overt pronouns could be bound in Spanish.

A similar effect is found in questions:

(11) Dare-ga [$_{\overline{S}}$ kare-ga atawa-ga ii to] [e] itta
Who-nom he-nom be-smart COMP e said

to omotte iru no
COMP think Q

('Who thinks that [e] said that he is smart')

Here again, the overt pronoun kare cannot be interpreted as a bound variable, even though there is a bound pro that could in principle license the binding, as it did in the Spanish cases.

This suggests that the condition on overt pronouns in Japanese is stronger than the one for Spanish. Indeed, we might assume that the form that the OPC takes in Japanese is the following:

(12) OPC-2

Overt pronouns cannot have formal variables as antecedents

Recall that the version of the OPC we had for Spanish (call it OPC-1) indicated that overt pronouns cannot link to formal variables. Recall also that linking is a non-transitive relation, and that antecedence was defined as the transitive closure of linking. Hence, in Japanese, overt pronouns cannot have formal variables as antecedents. This means that no matter how many empty bound pronouns appear in the construction, if the overt one is member of a P-chain that ends up in the formal variable, OPC-2 will rule out the bound interpretation for the overt pronoun.

Something similar seems to be the case in Chinese. Xu (1984) reports the following cases:

(13) a. meiyou ren bu xihuan e mama
no man not like e mother

b. meige ren xiwan e neng xingfu
every man wish e can happy
('Everybody wishes that e can be happy')

Xu writes: "If an overt pronoun is inserted in the site of e in (13a, b), it is construed as referring deictically to a specific person in the context" (Xu 1984:13). Of course, with the empty pronouns, as in examples (13a, b), the bound interpretation is available.

Hence, he conludes that examples (14a, b) (which are the overt pronoun versions of (13a,b)):

(14) a. meiyou ren bu xihuan ta de mama
he

b. meige ren xiwan ta neng xingfu
he

cannot be interpreted as (15a, b) respectively:

(15) a. (for no x, x a person) (x doesn't like x's mother)

b. (for every x, x a person) (x wishes x can be happy)

These cases reported by Xu seem again to fall under the OPC [4].

Consider now the case of Catalan[5]. The following sentences show that the basic OPC effects are operative:

(16) a. [Ningú] [t] no creu que[ell]és intel.ligent
↑_| ↑___*_____|

('Nobody believes that he is intelligent')

b. [Ningú] [t] no creu que [pro] és intel.ligent
↑_| ↑_____|

(17) a. [Qui] [t] creu que [ell] és intel.ligent
↑_| ↑__*__|

('Who believes that he is intelligent')

b. [Qui] [t] creu que [pro] és intel.ligent
↑_| ↑_____|

In Catalan, the a sentences are ungrammatical with the linkings shown. That is, overt pronouns cannot link to formal variables. As expected, these sentences contrast with the b sentences which contain empty pronouns (pro). These empty pronouns can be construed as bound pronouns. The contrast seems, here too, to reflect OPC effects.

Consider however the following pairs:

(18) [Ningú] [t] no creu que [pro] va dir que [ell] és intel.ligent
↑_| ↑_____| ↑_____|

('Nobody believes that pro said that he is intelligent')

(19) [Qui] [t] creu que [pro] va dir que [ell] és intel.ligent
↑_| ↑_____| ↑_____|

('Who believes that pro said that he is intelligent')

These sentences containing an intermediate bound pro in between the formal variable and the overt pronoun are judged as ungrammatical or

??. Recall once again that in Spanish these sentences can be interpreted as containing an overt pronoun which acts as a bound variable.

Catalan thus seems to behave according to the OPC-2, the version of the OPC which we suggested for Japanese. That is, in Catalan, overt pronouns cannot have formal variables as antecedents, a stronger requirement than the one used for the OPC-1.

These facts present us with an interesting puzzle. Our judgements for Catalan come from native speakers of both Catalan and Spanish. These speakers, when confronted with Spanish data, apply the OPC-1, that is the version of the OPC that says that overt pronouns cannot link to formal variables. But, when confronted with Catalan data, they apply the OPC-2, that is the stronger version, which blocks formal variables as antecedents for overt pronouns. Query: how do Catalan/Spanish native speakers learn the differences in interpretive behavior of overt pronouns in each language? And, furthermore, are the differences learned, or they reflect deeper principles of grammar? We have no solution to this puzzle for the moment.

Consider finally the case of Brazilian Portuguese[6]. As a start, consider the following sentences which exhibit basic OPC effects:

(20) a. [Quem] [t] acha que [ele] é inteligente
↑_| ↑____*____|

('Who thinks that he is intelligent')

b. [Quem] [t] acha que [pro] é inteligente
↑_| ↑_____|

(21) a. [Ninguém] [t] acha que [ele] é inteligente
↑_| ↑____*____|

('Nobody thinks that he is intelligent')

b. [Ninguém] [t] acha que [pro] é inteligente
↑_| ↑_____|

In the a sentences, the overt pronouns cannot be interpreted as bound variables, but in the b sentences, which contain empty pronouns such interpretation is perfectly available.

Consider now the intermediate pro sentences:

(22) a. [Quem] [t] acha que [pro] disse que [ele] é inteligente
↑_| ↑_____| ↑_____|

('Who thinks that pro said that he is intelligent')

b. [Ninguém] [t] acha que [pro] disse que [ele] é inteligente
↑_| ↑_____| ↑_____|

('Nobody thinks that pro said that he is intelligent')

Native speakers seem to have a hard time trying to bound the overt pronoun in these sentences, even though there is an intermediate bound pro which again could in principle license the bound reading of ele in (22a, b).

This suggests that in Brazilian Portuguese (as in Japanese and Catalan) the relevant version of the OPC might be OPC-2, namely, the requirement that overt pronouns don't have formal variables as antecedents.

This brief analysis of the OPC in Japanese, Chinese, Catalan, and Brazilian Portuguese, suggests that (a) indeed overt and empty pronouns behave differently with respect to their binding possibilities; and (b) that the OPC must be parametrized in order to account correctly for the interpretive behavior of overt and empty pronouns.

Consider (b). The relevant distinction that languages seem to make can be expressed in terms of the relation between an overt pronoun and a formal variable. In OPC-1 languages (Spanish, Italian), overt pronouns cannot link to formal variables, although they can have formal variables as antecedents. Recall once again that linking is not transitive, but antecedence is. In OPC-2 languages (Japanese, Catalan, Brazilian Portuguese, Chinese?), overt pronouns cannot have formal variables as antecedents. Hence, in these languages, an intermediate bound pro doesn't license the binding of overt pronouns (as it did in OPC-1 languages), because pro will not break the antecedence relation between the overt pronoun and the formal variable. Notice furthermore, that this difference between OPC-1 and OPC-2 languages is rather naturaly expressed once we assume a linking theory of binding, which distinguishes the notion of linking from that of antecedence.

FOOTNOTES: Appendix

1. One might say that it also applies in languages in which the alternation is not available, only that in these cases the OPC will apply vacuously.

2. I am endebted to Mamoru Saito for discussion and data. We refer the reader to Saito (1984) for a more detailed discussion of these and related cases in Japanese.

3. In sentences like (2) and the following, the reflexive pronoun zibun acts as the empty pronoun. The contrast we are interested in however, is between kare and the empty form.

4. The question whether Chinese falls under the OPC-1 or the OPC-2 is left open, although Xu seems to suggest that Chinese is OPC-2.

5. I am endebted to Carme Picallo for discussion and data. Thanks also to Joan Mascaró.

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