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THE MEETING GROUND OF SYNTAX AND PRAGMATICS[1]

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1. INTRODUCTION

Pragmatics, as Georgia Green has recently defined it, has to do with «the factors that influence a speaker's choice to say something the way she does, and the hearer's interpretation of what has been said, and what was meant by it» (1989: 159). There are obvious connections here with other disciplines: linguistics, psychology, philosophy, anthropology and artificial intelligence. What I want to do here is look at where pragmatics trades with formal syntax, particularly with the present-day variant of generative grammar, the theory of Government and Binding. To this end, I will discuss a number of recent proposals bearing on the trading relations of pragmatics and syntax.

A recent circular announcing the foundation of the International Pragmatics Association gives the following general description of the area: «today pragmatics is a large, loose and disorganised collection of research efforts.» This statement could create the impression that it is difficult to look upon pragmatics as a coherent discipline. However, there are now good textbooks available, such as Levinson (1983), and indication that as an academic discipline pragmatics has come of age. The attitude towards it held by linguists has generally been one of dismissal, however. If a particular phenomenon in a language is too ill-behaved or wayward to fit into existing

phonological, syntactic or semantic components of the grammar, then it must be pragmatic and can thus be dismissed or is simply not worth worrying about.

It would be a considerable gain in orderliness if we could manage to modularise pragmatics, either as a theory itself or with respect to (some of) its components. Can we ever expect that an independently motivated pragmatic theory (or perhaps theories) provides the simple generalisations that we also find in other components of the grammar? Is pragmatics a module? Leech (1983: 21) says that syntax and semantics are *rule-governed* but that pragmatics is *principle-controlled*. And Sperber and Wilson (1986) point out that pragmatics cannot be a module given the indeterminacy of the predictions and explanations it offers and the global knowledge it calls upon. If it is not a module itself, can it then perhaps be internally modular in the sense that there are conceptually distinct subcomponents that operate simultaneously to yield a single account of a given phenomenon, like the passive in GB theory? Some such interactions have also been proposed in pragmatics and the area of pragmatics has consequently been divided into various subfields like *conversational* pragmatics, *functionalist* pragmatics and even *psycholinguistic* pragmatics. I shall take pragmatics to be, as Stalnaker (1972: 383) defines it, the study of linguistic acts and the contexts in which they are performed.

What are the central concerns of pragmatics? Deixis or indexicality is a central area in pragmatics: we would be dealing here with expressions whose meaning can best be viewed as a function of context to individual by assigning values to variables for speaker, hearer, time and place of utterance, style or register, etc. Tense / aspect markers and words such as *I, you, here, there, now, then,* are typical indexicals. Since these elements are subject to variable interpretations, the utterances of which they are a part cannot be interpreted merely in terms of their truth-conditional semantics. Pronouns will be one of the central topics in what follows, to see whether a fully pragmatic account of them can be proposed. One of the other central topics in pragmatics, to the extent that it is one of the aspects of pragmatics most frequently mentioned and discussed, is Grice's Cooperative Principle, on which a whole theory of inferencing or implicature was eventually built. Within this overarching principle Grice defined four maxims of conversation which he took to define all rational interchange. These maxims have been the subject of much study and have also been shown to be in need of improvement in that they are both too weak and too strong. This objection might be countered by assuming that Grice's principles are universal, but that their relative strength in a given context might vary across languages and cultures, i.e. that they have parameters of variation, just as has been proposed in syntax. Pragmatists have continually

been trying to hone the set of maxims down to a set of rules which are truly indispensable and which do not constitute submaxims of other members of that set. The most radical version of this endeavour is probably Sperber and Wilson's Principle of Relevance.

However all this will ultimately be resolved, it should be clear that it is principally the interface of pragmatic inference and grammar that constitutes the focus of interest for the linguist. Let me begin the discussion with a review of what has become known as the pro-drop parameter, which has been put forward as a candidate in which syntactic and pragmatic principles are intertwined.

2. THE PRO-DROP PARAMETER

In general, sentences are subject-predicate constructions. In tensed clauses, the subject NP shows agreement with the tensed verb. The subject NP is obligatory in tensed causes in languages like English and Dutch, and of the Romance languages, French, Italian and Spanish may have tensed sentences without an overt subject NP:

(1) Parliamo italiano.
«We speak Italian.»
Hemos trabajado todo el día.
«We have worked all day.»
*Speak Italian.
*Avons travaillé toute la journée.

Not realising the subject lexically in tensed clauses is called pro-drop. The expression of the subject in language is a central property, and is hence unlikely to be language-particular. It is fairly obvious that the explanation of this conspicuous difference between languages should be viewed as involving variation of a universal property. The first thing to do is to see whether variation in the lexicalisation of the subject position can be seen to be related to other properties of the language, so that pro-drop would be a consequence of the choice of a value for a parameter in Universal grammar (i.e. realisation of the subject as a lexical element). There are at least two sets of phenomena which have long been believed to be related to pro-drop: free inversion and long-distance extraction of the subject of embedded sentences. These facts are illustrated in (2) and (3):

(2) Gianni crede che è partito Mario.
«Gianni believes that is left Mario.»
Juan dijo que estaba agotado el libro.
«Juan said that was sold out the book.»
*John says that was sold out the book.
*Jean dit qu'est parti Pierre.

(3) Chi credi che verra a visitarci?
«Who believe-you that will come to visit here?»
¿Quién dijiste que salió temprano?
«Who did you say that left early?»
*Who do you think that left early?
*Qui a-t-il dit que va venir ce soir?

On the assumption that the normal place for the subject is pre-verbal, the subject position appears to be unfilled in three specific contexts in Italian and Spanish: in tensed sentences, in sentences in which the subject is post-verbal and in embedded sentences from which the subject has been removed by long-distance extraction. We may now start a search for a principle X in Universal Grammar that sees to it that some grammars contain the +X value of the parameter (say Italian and Spanish), while the others select the -X value of the parameter. The determination of the value of X has the presence or absence of the properties in (1)-(3) as a direct consequence.

In the matter of language acquisition the question is now how the language-learning child can determine the value of parameter X as it applies to their own language. This can only be done on the basis of positive evidence. An English child will not be offered the ungrammatical English sentences in (1)-(3). Now this is not in itself sufficient to determine that X must have the minus value, since the absence of tensed sentences with a non-lexical subject in English might be a coincidence. The child is never offered the ungrammatical sentences as negative evidence. The Spanish child, on the other hand, can immediately infer the positive value of X, since a Spanish sentence of the type in (1) will almost certainly be offered to the child as positive evidence, from which they may infer that the structures in (2) and (3) also belong to their language. The English child requires a markedness corollary; as long as there is no positive evidence pointing to the contrary, the child opts for the unmarked value of the parameter, i.e. -X. The Spanish child will eventually ascertain that Spanish is +X, selecting the marked value of the parameter.

This looks neat, but a note of caution should be sounded. Syntactically, the correlation of the occurrence of pre-verbal empty subjects with the possibility of the occurrence of post-verbal subjects in pro-drop languages is

a more complex phenomenon than appears at first sight. A more precise look at long-distance extraction in the Romance language reveals that what looks like long-distance extraction of a pre-verbal subject in effect takes place from the post-verbal subject position rather than from the pre-verbal. The facts of Italian *ne*- cliticisation are telling in this respect:

(4) a. Qui pensi che ha telefonato?
«Who think-you that has telephoned?»
b. Gianni *(ne) ha letti tre.
«Gianni of-them has read three.»
c. Due studenti sono arrivati.
«Two students are arrived.»
d. Sono arrivati due studenti.
«Are arrived two students.»
e. Due (*ne) sono arrivati.
«Two of-them are arrived.»
f. *(Ne) sono arrivati due.
«Of-them are arrived two.»
g. Quanti pensi che *(ne) sono caduti?
«How many think-you of-them are fallen?»

(5) a. *Wh [... [$_{CP}$ CHE [t... V...]]]]
Wh [... [$_{CP}$ CHE [...V t...]]]]

The argument goes as follows: (4a) shows once again that a finite embedded clause in Italian may occur without a subject. In (4a) the questioned subject of the embedded clause *qui* has been extracted across the lexical complementiser *che* and placed in sentence-initial position. Italian has a clitic element *ne* that is obligatory if an NP with a quantifying specifier, such as a numeral, occurs in object position without a lexical head noun. This is shown in (4b). If a quantified NP is used as the subject, the situation is slightly more complicated. Subjects are either pre-verbal or post-verbal, as shown in (4c) and (4d). If, however, the subject is a quantified NP with an empty head noun, *ne* is obligatorily present if the subject is post-verbal, and obligatorily absent when the subject is pre-verbal. This is shown in (4e) and (4f). The main verb in the embedded clause in (4g), *caduti,* is ergative, i.e. it has a derived subject at S-structure. At D-structure the NP headed by the quantifying determiner *quanti* occupies a post-verbal position as the internal argument of the verb.[2] The prediction is now that if extraction is from pre-verbal position, *ne* would have to be absent. If extraction is from post-verbal position, we would predict that *ne* would have to be present, and as (4g) shows, this is the case. So, extraction

cannot be from pre-verbal position. This implies that (5a) cannot be the structure of (4a) and (4g); rather (5b) must be the relevant structure.

All this shows that, at least as far as Italian is concerned, the relation of pro-drop to whether or not long-distance extraction of the subject is possible is no longer so clear. It has been suggested that we should instead try to establish a connection between the rich inflectional morphology of Italian and Spanish and the presence of pro-drop on the one hand, and the impoverished verbal morphology of English and the absence of pro-drop, on the other. There is an obvious correlation between the morphological richness of the verbal paradigm and the possibility of pro-drop. In the present tense finite paradigm of Italian and Spanish the features for person and number (the agreement features) are spelled out in the various verb forms, while English only realises a separate form on the 3rd person singular form: (io) *parlo*, (tu) *parli*, (lui) *parla*, (noi) *parliamo*, (voi) *parlate*, (loro) *parlano*, *vs.* I *speak*, you *speak*, he *speaks*, we *speak*, you *speak*, they *speak*. English needs a spelled-out agreement relation between the subject and tensed inflection. The interpretation of the pronominal features for person, number and gender in Italian does not require an overt subject. The verbal inflection suffices for this purpose. The dependency in English can be captured by taking INFLection in English to be insufficiently specified for the relevant features and requiring as it were a lexical antecedent for the appearance of the appropriate inflectional features. INFL would thus be anaphoric in English, requiring a lexical antecedent (an overt subject) for its identification. In Italian, INFL is fully specified itself for pronominal features, and can hence be said to be pronominal, not requiring a lexical pronominal to identify it. In this way the pro-drop parameter can be reduced to a difference in the binding requirements of INFL: if a finite INFL is anaphoric, it requires a lexical subject to bind it; if INFL is pronominal, a lexical subject is optional.

The nature of the pro-drop parameter has now been sufficiently illustrated, and I will turn to what has been taken to be the contribution of pragmatics to this parameter. The question is: what role is played by pragmatic information in the fixing of the parameter, as opposed to structural information, such as the relative strength of INFL? Hyams (1986) has proposed that in their acquisition of English children start out from the unmarked setting of the parameter and assume from the start that English is pro-drop, and hence have to learn on the basis of positive evidence that it is not. What is this evidence? The evidence is structural in the first instance: English, for instance, has expletive subjects such as *it* and *there*, but Hyams argues that the evidence is also partly pragmatic, specifically in that English exploits what Chomsky refers to as the «Avoid Pronoun» Principle. The effect of this principle is shown in (6):

(6) a. John would much prefer eating alone.
b. John would much prefer his eating alone.

(6a) is preferred to (6b) if *his* is to be construed as coreferential with *John*. Chomsky (1981: 227) described the Avoid Pronoun principle as one of those principles that «interact with grammar but do not strictly speaking constitute part of a distinct language faculty, or, at least, are specific realizations in the language faculty of more general principles . . . .» For Hyams the Avoid Pronoun Principle is a «universal pragmatic principle» and she claims that it operates in the fixing of the pro-drop parameter. I quote her argument in (7):

(7) (by hypothesis the child) operates under the Avoid Pronoun Principle, and hence, expects that subject pronouns will be avoided except where required for contrast, emphasis, etc. In English contrastive or emphatic elements are generally stressed. Once the child learns this, any subject pronoun which is unstressed might be construed as infelicitous . . . the child could then deduce that if the referential pronoun is not needed for pragmatic reasons, it must be necessary for grammatical reasons, i. e. a null pronominal is impossible, and hence, AGR is not PRO. (Hyams 1986: 94)

English is not pro-drop on this account. Naturally the question remains as to whether it can really be maintained that a so-called pragmatic principle like the Avoid Pronoun Principle can be said to be involved in the pro-drop parameter. A pragmatic principle of this kind would constrain the production and consequent interpretation of an utterance whose syntactic structure must have been noticed by he child first in order for the pragmatic principle to find a domain of application. This implies that the Avoid Pronoun Principle would have to be grammaticalised across languages, i.e. it would have to be a cross-linguistic fact that languages contain functionally useless elements, and there does not seem to be prima facie evidence for this claim. Our conclusion would therefore have to be that an appeal to pragmatic factors in the fixing of what is evidently a syntactic parameter is unwarranted. The development of the grammar would appear to be independent of interaction with pragmatics, as far as this case is concerned.

Let us now look at other areas where interaction of syntax and pragmatics has been hinted at. There have been attempts to take the imperative subject restriction out of the syntactic component and place it squarely in pragmatics. Is that purely a matter of pragmatics? While it is true that the 2nd person pronoun is conventionally associated with the addressee, this is not an absolute fact.[3] In the case that speaker and hearer fall together in one individual, as is the

case when I look at myself in the mirror at seven o'clock in the morning, I still can only say *Shave yourself*, and never *Shave myself*. Note that the ungrammatical variant cannot be ruled out on pragmatic grounds, because the addressee is present in the discourse. The sensible thing to say here is that the agent in an imperative sentence, whether or not overtly represented, must somehow not just denote the addressee, but count as 2nd person. This restriction is clearly pragmatically motivated but has become conventionalised as a fact in the grammar of English. In other words, pragmatics may have motivated the syntactic fact, but this fact must be incorporated in the grammar.

A third area in which a pragmatically influenced process has been conventionalised is anaphora. Anaphoric expressions are expressions whose interpretations are determined by some other element. As such this dependency has been investigaged thoroughly in the study of meaning in natural language over the last twenty years. I assume that a pronoun gets its value in sentence semantics, which I take to be a specification of the truth conditions of that sentence. Pragmatics then provides an account of how sentences are used in utterances to convey information in context, and so pragmatics accounts for everything else there is in the sentence, apart from its truth-conditional content. This is aptly summarised in Gazdar's (1979) famous dictum in (8):

(8) A: What's that new Pizza House like?
B: All the cooks are Italian
C: Let's go there then

(Kempson 1988: 140)

B takes A's question to be a question not about the place, but about the food. B's answer is not about food at all; it mentions a nationality, which is acceptable to A as information about food, however. There is thus a lot of indirect information that is being handled below the surface of the conversation and that is never explicitly expressed. Kempson notes that this indirect information handles such premises as provided in (10):

(10) If you ask a question about a house that serves food, you ask about the food served there.
People who cook a dish associated with their country of origin cook it well.
Pizza is an Italian dish.

According to Grice the Cooperative Principle comes into play to determine the additional information (the *implicatures)* which might be deduced by the

hearer from an utterance beyond its truth-conditional content, on the assumption, as Grice notes, that speakers do not say what is false, irrelevant, too much or too little. Indirect information is conveyed when these maxims seem to be flouted so that additional assumptions have to be made by the hearer in order to understand the speaker as uttering something meaningful, relevant and truthful. And a lot of work since Grice formulated his pragmatic framework has been devoted to arguing that a wide range of phenomena which had previously been thought to be part of the linguistic meaning of an expression could be better explained as conversational implicatures and not as the proposition directly expressed by the sentence.

I noted above that pronouns and anaphoric expressions in general are subject to variable interpretations, so that utterances of which they are a part transcent truth-conditional semantics. I want to discuss these facts in greater detail now, to show eventually that it is incorrect to maintain that pragmatics is totally divorced from the grammar of the utterance. It will turn out that in this area the principles of grammar interact with the principles of pragmatics to determine propositional content, and this is a position which is not easy to reconcile with existing positions, where truth-conditional semantics belongs to the grammar and where pragmatics is an unconnected component. Let us look at the anaphoric pronominals first.

Government-Binding theory, like any formal theory of grammar, should account for the following facts concerning pronominals:

- pronominal coreference can be established across an in principle unlimited distance:

(11) John$_i$ said that Pete had suggested that Charles had heard that . . . my photograph of him$_i$ had come out very well.

- at the same time, a minimum distance is also a prerequisite:

(12) John$_i$ saw him$_i$ in the mirror.

In Government-Binding theory, pronominal coreference is therefore constrained to an indication of the conditions under which pronominal coreference is *not* allowed: in (12) the grammar merely says that the pronoun *him* may refer to any male human being that is not called *John*. Under what conditions are pronouns licensed?

a. The pronoun is not coindexed with any NP in the sentence.
b. The pronoun is coindexed with an NP, but this NP is outside the binding category of the pronoun.

c. The pronoun is coindexed with an NP inside the binding category of the pronoun, but the NP does not c-command the NP.

Illustrations of these facts can be found in (13)-(15):

(13) a. He$_i$ came in.
b. John$_i$ said he$_i$ came in.
(14) My parents$_i$ knew [$_{CP}$ that I respected them$_i$]
(15) [[John$_i$]'s father] often beats him$_i$

Two constituents enter into a binding relationship if they are coindexed and if α c-commands β. We define the binding category as follows:

(16) XP (a maximal projection) is a binding category for α if XP is the minimal XP that
a. contains α
b. contains an opacity factor, where subject and [+finite] count as opacity factors

The examples given in (13)-(15) indicate that a pronominal must not bound, i.e. is free, in its binding category. This requirement is one of the binding principles of the Binding Theory, and is generally known as principle B; it is presented in (17):

(17) Principle B of the Binding Theory:
A pronominal is free in its binding category.

The free nature of the pronominal is clearly illustrated in (13). (14) shows that the binding category is the embedded CP, and that the pronominal is free inside that CP, while (15) indicates that the binding category, i.e. the node dominating the clause, contains both the coindexed NP and the pronominal, but the coindexed NP does not c-command the pronominal.

The important thing here is not so much the formulation of Principle B of the Binding Theory but rather the fact that it is essential to treat the class of pronouns as *unitary*. However, if we take the truth-theoretic properties of pronouns as basic, we can no longer regard the class as unitary. As Kempson (1988) has noted, there are at least five different types of pronoun if we base ourselves on their truth-theoretic content:

(18) *Referential pronouns*
She is very handsome.
Charles$_i$ thinks that everybody suspects that he$_i$ is very clever.

(19) *Coreferential pronouns*
Charles$_i$ thinks that he$_i$ is very clever.
After her$_i$ usual second sleeping pill, Mary$_i$ fell asleep.
(20) *Bound-variable pronouns*
Every farmer$_i$ worries that he$_i$ produces too much milk [he = each one of the farmers].
(21) *E-type pronouns*
Most people that buy a new car treat it well [it = the new car that each of the people in question have bought].
(22) *Lazy pronouns*
My grandfather put his paycheck under the bed, but anyone with any sense puts it in the bank [it = their paycheck].

Referential pronouns refer directly to a non-linguistic entity in the discourse. Pronouns are coreferential when their reference to a non-linguistic entity is in virtue of their coreference with some linguistic expression elsewhere in the discourse (the antecedent). Bound-variable pronouns do not refer to a fixed entity at all but may pick out various individuals in virtue of their dependence on some quantifying expression in the sentence. E-type pronouns are neither bound-variable pronouns nor pronouns whose value is fixed by coreference, while finally, lazy pronouns are not identical in truth-theoretic content to their antecedent, but appear rather to be modelled on the linguistic form of that antecedent.

When we view this array of data we cannot but arrive at the conclusion that an English pronoun is in principle ambiguous, a set of discrete lexical items. There have been attempts to reduce this kind of ambiguity, but any analysis of the meaning of pronouns in terms of their truth-theoretic content (referential, bound-variable, E-type or lazy) cannot give a unitary explanation of pronominal anaphora. As has been noted by Kempson and others, this ambiguity is not restricted to pronominals. It is also found in definite NPs, NPs which have the article *the*. Consider the following examples, some of which I borrowed from Kempson (1988):

(23) The man in the corner coughed. (referential)
(24) John stepped into the room and the poor bugger was crying. (coreferential)
(25) Of every house in the area that was inspected, it was later reported that the house was suffering from subsidence problems. (bound-variable)
(26) Everyone who acquired a copy later discovered that the copy was not quite like the original. (E-type)

(27) John walked into the kitchen.
The windows were dirty. (bridging cross-reference)

(27) is slightly different form (23)-(26). In (27) the use of *the*, the marker of definiteness, does not mark coreference with a preceding NP, but rather a link of association with some preceding expression, a link based on our world-knowledge and established via the addition of background knowledge. The problem that raises its head here is whether we should incorporate the entire range of our encyclopedic knowledge in the representation of lexical structure. This is not something that can be discussed here, but our conclusion must be that the phenomenon of definiteness of NPs does not seem to be amenable to a unitary treatment and is therefore ambiguous, probably across languages.

Arguments about systematic meaning relationships between sentences lead us to the same paradoxical conclusion. Consider (28) and (29):

(28) Joan went to the performance of *Carmen*.
(29) There was a performance of *Carmen*.

These sentences are related by what has been called *presupposition*. It arises with definite NPs, which presuppose the existence of the object referred to by the definite NP, and with factive verbs like *regret* which presuppose the truth of their complement.

(30) Joan regrets that Philip is married.
(31) Philip is married.

The relation between these pairs is clearly brought about by *the* of the definite NP «the performance of *Carmen*» and the verb *regret*. If meaning relations between sentences are the concern of the semantic component of the grammar, the grammar itself should be able to characterise presupposition relations between sentences. There is a problem here, however, since it appears that such a (recursive) characterisation is sensitive to the context in which the presupposing sentence is contained; sometimes the presupposition is preserved under embedding, sometimes it is not. This is the well-known presupposition projection problem.

(32) If Bill stayed at home, Joan went to the performance of *Carmen*.
(33) If Bill has staged a performance of *Carmen*, Joan went to the performance of *Carmen*.

(32) takes the truth of (29) for granted, which (33) does not. Compare also the following sentences:

(34) If Bill is in love with Sue, then she regrets that Philip is married.
(35) If Philip is married, then Sue regrets that Philip is married.

Again (34) presupposes (31), which (35) does not. These odd differences in the constancy of presupposition relations arise as a result of the interaction between the lexical items *the* and *regret* on the one hand and the connective *if* on the other hand. Sentence embedding is a rule of grammar, of syntax, and thus the kind of relatedness between sentences that we have observed has to be sensitive to information contained in the grammar. But not just that: it can be shown that relatedness between sentences, which requires them to have access to syntactic information, in addition needs to have access to real-world knowledge of the type manipulated in bridging cross-reference. Gazdar (1979) has provided the following pair of sentences:

(36) If the President invites George Wallace's wife to the White House, he'll regret having invited a black militant to the White House.
(37) If the President invites Angela Davis to the White House, he'll regret having invited a black militant to the White House.

(36) is an utterance about the wife of a racist politician in the state of Alabama in the early seventies. (37) is about the black American militant Angela Davis in the same period. But can the black militant in the main cause of (36) be presumed to be Mrs Wallace? If we have a sense of history, we would consider it most unlikely, and we would consequently not take the black militant in (36) to be Mrs Wallace. But we have seen that the factive verb *regret* presupposes the truth of its complement, i.e. it will be taken for granted by the speaker of (36) that the President *has* invited a black militant to the White House. However, a speaker who knows that the name Angela Davis refers to this well-known militant would certainly not be taking for granted the truth of the President having invited a black militant to the White House. Note that there is nothing in one's knowledge of language, i.e. in the processing of the linguistic structures provided, that distinguishes between (36) and (37); it is the knowledge of the people described that the speaker is trading on.

Pronominal reference and presupposition projection thus turn out to be two areas where a unitary account cannot be given exclusively by the rules of grammar but needs to be supplemented by rules of the pragmatic component. A further problem area is quantifier-variable binding. Anaphoric expressions,

whether they are pronouns or definite NPs, are subject to a syntactic restriction, i.e. they can only occur in a particular syntactic configuration. We have already seen that pronouns are either construed as bound variables or as referential. Bound-variable pronouns are dependent on an antecedent for their value while referential pronouns are not dependent on an antecedent but take their reference directly from some entity in the discourse situation. If a pronoun is a variable it is dependent on some operator, such as for example a quantifier, under c-command, i.e. the quantifier should be higher in the tree than the anaphoric pronoun:

(38) Every soprano thinks that she will lose her voice.
(39) She thinks that every soprano will lose her voice.

In (38) the quantifier *every*, which is part of the quantified NP *every actress*, has proper scope over the variable *she* since it c-commands the pronoun. In (39) *she* cannot be a variable since it is not bound by a c-commanding operator. We have seen in (25) that a definite NP can also be anaphorically dependent on a quantifying expression. This dependency is also subject to c-command:[4]

(40) Every computer in that batch needed the disc drive to be replaced.
(41) The disc drive needed every computer in that batch to be replaced.

(40) can be interpreted as the disc drive of each individual computer being faulty and in need of replacement, so that the referent of *the disc drive* ranges over the same set as that of *every computer*, where the coreferentiality would be based on bridging cross-reference properties accessed by the definite NP *the disc drive*. But (41) cannot be so interpreted: there is just one disc drive involved here. (40) thus allows a bound-variable reading in which the disc drive is each computer's disc drive. This dependency between *the disc drive* and *the computer* is not construed under identity but by the additional premise that computers have disc drives. This additional premise is a pragmatic phenomenon. So quantifier-variable dependencies, which are to be syntactically characterised as falling under some definition of c-command, need to be made sensitive to pragmatic premises necessary to establish bridging cross-reference. A similar side-issue arises here: are we to include all of our encyclopedic knowledge in our lexical specifications, if we wish to give a unitary, grammatical, account of these phenomena, or should we accept that quantifier-variable dependencies cannot be handled entirely in the province of the grammar? My own preference, as should be clear by now, is for the latter of these alternatives.

Three areas have now been isolated where a unitary account of the phenomena —pronoun ambiguity, systematic meaning relationships and syntactic restrictions on interpretation— inescapably leads to the conclusion that the needs to be more than rules of grammar or principles of grammar to arrive at full utterance interpretation.

When put in this way, the question involves, among many other things, a decision as to what precisely can be called a grammar. Could we perhaps devise a modular theory of the linguistic system that includes a pragmatic component? We might, for example, maintain that linguistically relevant information is present at various levels in the grammar: structural information as encoded in the syntax, lexical-semantic information, wich is encoded principally in the lexicon and in the computational rules of the LF component, and pragmatic information, the one «component» functioning either as the input for the other, or working in tandem with the other "components". If we adopt this tack, we will be forced to admit at a certain point that pragmatic information particular to a lexical item is part of the definition of that lexical item. I am reluctant to include encyclopedic information in the specification of lexical items.

In the final part of this paper I would like to put forward some speculations on the relationship between language and thought. What does it mean to have knowledge of language? Chomsky, in *Knowledge of Language* (1986: 10), views knowledge of language, or the language faculty, as «one 'module' of the mind.» It is quite customary in contemporary cognitive science to embrace the notion of modularity. Notice that we should first define whether we want our theory to be *externally* modular, i.e. when it operates only on a specific domain of information and has principles of operation that do not reach outside that domain, or *internally* modular, i.e. when it is analysable into distinct, but interacting subsystems. Government and Binding theory is internally modular in that Chomsky looks upon it as having two subsystems; a rule component, comprising the lexicon, the syntax, PF and LF, and a principles component, comprising bounding theory, Θ-theory, binding theory, government theory, case theory and control theory. A theory that views the language faculty as a processing system, i.e. an input-output system that acts on external stimuli and converts these into a representation of grammatical (and possibly logical) form has been devised by Fodor in *The Modularity of Mind* (1983). Note that modularity, either of the external or of the internal kind, is simply an instance of what Pylyshyn has dubbed

(42) «a central goal of explanatory theories» namely «to factor out a set of phenomena, a problem, or system into the most general and perspicuous components, principles or subsystems» (1980: 121).

Whether one views the grammar as externally modular or internally modular, the fact remains that the output of the grammar seriously undermines any possibility to represent the content of what is licensed by the grammar. This has been the main thrust of the argument; the evidence provided by the ambiguity of pronouns and the interaction between syntactic constraints and pragmatic processes undeniably points to underdetermination. To overcome this underdetermination, the output specification of the grammar must be enriched to determine the intended interpretation of a sentence in its context. It has recently been suggested that such an enrichment can be provided by the principle of relevance.[5]

Sperber and Wilson (1986) also claim that a grammar is an input system in the sense of Fodor, providing a mapping (or translation) from a characterization of the sequence heard, so a phonological representation of an expression of natural language onto a logical configuration, an expression in the language of inference required by the central cognitive mechanism (the language of thought). Fodor's view holds that we process the information presented by the world around us by the construction of mental representations, the language of thought, and the claim is that cognitive processes such as inference—inference strategies take the hearer from the speaker's utterance to the speaker's communicative intention— can be characterised syntactically. As we have seen above, for example in the case of the bridging cross-reference examples, the grammar does not provide enough of the necessary clues, i.e. it underdetermines the representation of the content attributable to the string determined by the grammar. In the case of the real-semantic ambiguity of pronouns, the underdeterminacy tenet could be implemented as follows: the grammar only makes available a categorization of the class of elements and an indication of the requisite locality, while the interpretation is provided by pragmatic processes. Sperber and Wilson propose in their book that there is just one principle to enrich the output specification of the grammar: the principle of relevance:

(43) *The Principle of Relevance:* every utterance conveys the assumption that the speaker believes their choice of words is such as to make immediately accessible to the hearer (i.e. with the least processing effort possible) an interpretation which gives rise to the intended inferential (or other cognitive) effect.

Thus, the choice of representation to assign a value to the pronominal is controlled by the principle of relevance, i.e. with the least effort for the maximum effect, in conjunction with a locality requirement intrinsic to

pronominals: Principle B of the Binding Theory. All anaphoric uses of pronominals depend on the assumption that the value to be assigned to the pronoun is a *cognitive* representation which is retrievable with least processing costs for the effects intended. The grammar provides but an incomplete conceptual basis of interpretation of an utterance, not the interpretation itself. Consider here once again the examples in (6):

(6) a. John would much prefer eating alone.
b. John would much prefer his eating alone.

Relevance theory can deal with these examples virtually automatically: minimize processing costs and maximize the contextual implications of the sentence. On this account (6b) would simply contain more words than (6a) and would therefore be more complex (by the presence of *his).* It would follow naturally from a relevance account of these examples that *his* conveys information that is not recoverable from the empty category, i.e. the non-lexical subject of *eating alone,* specifically that the antecedent of *his* is not *John* but some other person present in the discourse.

Sperber and Wilson hold that the interpretation of an utterance invariably involves establishing both its explicit and its implicit content, that is, establishing what proposition the utterance has actually expressed (i.e. establishing its logical form), and accessing the content (= a set of extra propositions), all additional information being available to the hearer at minimal processing cost. If it is the case that anaphor-antecedent relationships are established pragmatically (on the assumption that both pronominal and definite NP anaphor-antecedent relations constitute a unitary and pragmatic phenomenon), rather than syntactically, the additional information available to the hearer must be accessible too, and at low cost at that.

The sentence in (44), which illustrates again the phenomenon of bridging cross-reference, also brings out what «additional information» amounts to:

(44) I walked into the cathedral. The stained-glass windows were spectacular.

All anaphoric expressions pragmatically guarantee that an antecedent is available from the discourse. If no antecedent is explicitly provided, neither by the discourse nor by the visual scene, it is assumed that the context provides it as additional information. In (44) no mention is made of windows in the first sentence. However, the fact that the speaker uses the definite NP *the stained glass windows* in the second sentence in (44) is taken as a guarantee that such a representation is accessible in the discourse. Now, the hearer only has the

words *cathedral* and *window* available. The concept *window* entails as part of its information that windows are for looking out of rooms, halls, houses, cathedrals, etc., and a cathedral is a kind of room, so the hearer would assume as part of the additional information that the cathedral would have windows. The fact that a definite article is used in *the stained glass windows* indicates that the hearer does make use of this additional premise. Explicit content just as much as implicit content has been used in this identification process.

Now, we have seen in (40) that bridging cross-reference can interact with quantifier-variable binding:

(40) Every computer in that batch needed the disc drive to be replaced.

What this sentence means is that for every computer - disc drive pair the disc drive needed to be replaced in the computer. The quantifier *every* in *every computer* has to bind the new variable introduced by the additional information contained in *the disc drive*, i.e. that computers have disc drives. What is this variable? Suppose that quantifying NPs have a variable assigned as part of the argument structure in logical form, that is in the semantic representation of the sentence. This variable is accessible only in the c-command domain of the associated quantifier:

(45) $[_{IP}$ every computer$_i$ $[_{IP}$ t_i INFL $[$VP V $[_{CP}$ $[_{IP}$ the disc drive$_i$ . . .

The use of the definite article in the NP *the disc drive* introduces the additional premise that computers make use of disc drives. The quantifier *every* thus also binds the variable associated with the (data frame) of this definite NP.

Our discussion so far has turned on the distinction between properties that are intrinsic to language itself and properties that belong to the general cognitive mechanism. In our discussion we have taken semantics to be such properties of interpretation that are rule-governed and invariant from context to context. On this account, pragmatics makes use of whatever input the grammar provides in the process of utterance interpretation.

NOTES

1. This is a lightly edited version of a lecture presented at the «Departamento de Filología Inglesa y Alemana» of the University of Zaragoza, Spain, in May 1990. I am grateful to Carmen Olivares Rivera for inviting me and to Jane Mallinson for discussions on the topic. My visit was made possible by the Commission of the European Communities ERASMUS.

2. There is a vast literature on the treatment of ergativity in Generative Grammar. For a representative specimen, see Burzio (1986).

3. For a recent treatment of the English imperative in the perspective of Government-Binding theory, see Beukema and Coopmans (1989), in which a more sophisticated discussion of the possibilities for the subject in imperative constructions is provided.

4. The examples in (40) and (41) were provided in a lecture given by Ruth Kempson at the University of Nijmegen, The Netherlands, on February 1, 1990. (41) is either gibberish or it has a non-real-world interpretation for most speakers of English that I have consulted. However, it is meant to illustrate in the first place that definite NPs showing bridging cross reference are also subject to c-command of an appropriate quantifier. The interpretation of (41) as crucially involving only one disc-drive is probably also bound up with a different meaning of *needed*.

5. See Kempson (1988) for more details on pronominal anaphora in a Relevance framework. For the original statement of the Principle of Relevance see Sperber and Wilson (1986).

REFERENCES

BEUKEMA, F. H., and P. COOPMANS. 1989. «A Government-Binding Perspective on the Imperative in English.» *Journal of Linguistics* 25: 417-36.
BURZIO, L. 1986. *Italian Syntax: A Government-Binding Approach*. Dordrecht: Reidel.
CHOMSKY, N. A. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.
---. 1986. *Knowledge of Language: Its Nature, Origin, and Use*. New York: Praeger.
FODOR, J. A. 1983. *The Modularity of Mind*. Cambridge (MA): MIT Press.
GAZDAR, G. 1979. *Pragmatics*. New York: Academic Press.
GREEN, G. M. 1989. *Pragmatics and Natural Language Understanding*. Hillsdale (NJ): Lawrence Erlbaum Associates.
HYAMS, N. 1986. *Language Acquisition and the Theory of Parameters*. Dordrecht: Reidel.
KEMPSON, R. 1988. «Grammar and Conversational Principles.» In *Linguistics: The Cambridge Survey*. Ed. F. J. Newmeyer. 2.139-63.
LEECH, G. 1983. *Principles of Pragmatics*. London: Longman.
LEVINSON, S. C. 1983. *Pragmatics*. Cambridge: Cambridge UP.
PYLYSHYN, Z. 1980. «Computation and Cognition.» *Behavioral and Brain Sciences* 3: 111-69.
SPERBER, D., and D. Wilson. 1986. *Relevance: Communication and Cognition*. Oxford: Blackwell.
STALNAKER, R. 1972. «Pragmatics.» In *Semantics of Natural Language*. Ed. D. Davidson and G. Harman. Cambridge: Cambridge UP.