

## COORDINATION AND CASE THEORY IN GB GRAMMAR

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**1. The standard view of Case Theory.** In GB grammar, as a consequence of the Full Interpretation Principle (cf. Chomsky 1986b:98), referential expressions (RE's, in what follows) in sentences of natural language must be 'interpretable' in the relevant senses, and therefore must be 'visible' to different classes of rules. RE's, however, are not homogeneous, and given the way GB theory is designed, fall into two large groups, lexical expressions (LE's) which have a phonetic matrix and an intrinsic interpretation of their own, and empty categories (EC's, from now on), which lack both. LE's, in turn, fall into several syntactic categories (N, NP, V, VP, etc.), and have different visibility requirements. As regards lexical NP's, they are 'visible', and consequently 'interpretable' in their phonetic and semantic aspects, when they bear abstract Case features. Empty NP categories, i.e., PRO, 'small pro' and trace, on the other hand, by definition lack a phonetic matrix and need not be visible to the PF rules. Neither need they be 'visible' (in that technical sense) to the LF rules, since their semantic interpretation is not autonomous, but supplied by the operators that bind them, and subject to well-defined configurational conditions. Consequently, they are exempt from Case requirements on both accounts.

The basic principle of Case Theory is the Case Filter (CF, from now on) cf. Rouveret & Vergnaud 1980:102, Chomsky 1980:25, Chomsky 1981, which, in an informal way, stipulates that a lexical N/NP without Case yields an ungrammatical expression. According to the revised technical formulation of CF, cf. Chomsky 1981:334, every lexical NP must belong to a chain  $\alpha...t...$  such that either the lexical NP directly, or one (and only one), of its traces occupies a position in which it receives one (and only one) Case under government by a proper Case assigner. This is a natural restriction under any reasonable theory of morphology, on the one hand, and of the function of traces, on the other, since the alternative situation, in which the same NP is realized, directly, or via inheritance from its traces, with two different Case features, say Nominative and Accusative, or even the same Case feature twice, is morphologically unthinkable (cf. Lat. \***domin-us-um**, \***dominusus**, \***dominum-us**, etc.).

A consequence of the Case Filter with high formal explanatory power is that NP-movement is possible only from Case-marked to non-Case-marked positions (WH-movement) or vice versa (NP Movement) and, in fact, not only possible, but obligatory, whenever a NP is projected at D-S in a non-Case-marked position (passives, infinitival subjects, etc.). Abstract Case marking, in its turn, is standardly assumed to be a prerequisite for the 'visibility' of the NP's for the purpose of  $\theta$ -role assignment and semantic interpretation at LF, on the one hand, and phonetic interpretation at PF, on the other, so given the T-structure of the model, the relevant Case marks must be assigned to lexical NP's at S-Structure at the latest.

As generally understood, abstract Case, like traditional morphological case, is a contextually supplied, not an inherent feature, i.e., nouns do not bear Case specifications in their lexical entries, but receive them from their maximal projections (by percolation) depending on the syntactic function the NP's play with respect to their governors (see Chomsky 1981:331 ff., however, for a possible alternative in terms of case-generation

in the lexicon and case-checking at S-S). Case, in other words, is supplied under government by certain types of heads which are assumed to be Case assigners. The inventory of Case-assigning heads and the nature of the Cases assigned vary cross-linguistically, though. In English, which nowadays has a relatively impoverished case system in comparison with even other modern IE languages (v. gr., German), these nevertheless include at least verbs, which assign objective case (or accusative/dative case, according to other proposals), prepositions, which assign objective (in other proposals oblique) case, the [+Tense] INFL node (or the verb bearing such features), which assigns nominative, and the genitive 's affix of NP's in Spec of N position.

Case features are assigned to NP's in one of two ways, i.e., either inherently, when they bear certain thematic and structural relations to lexical heads capable of projecting case features, or structurally, when they occupy certain specified positions, v. gr., Object or Spec of X, in the core cases. Inherent case is a property directly derived from the lexical entries of certain heads, and in that sense it is similar to  $\theta$ -role: certain lexical items have an inherent Case grid (Accusative-Dative, Dative, Genitive, etc.; the possibilities, of course, vary greatly from language to language) that they must obligatorily assign or discharge on their complements (cf. Belletti & Rizzi 1987). However, the C-grid and the  $\theta$ -grid do not invariably stand in one to one correspondence. In certain cases, an NP complement of a head may be  $\theta$ -marked, but not C-marked (v.gr., the object of a passive participle), and in that case, unless the NP is moved to, or otherwise linked with a position in which it receives a Case feature, it will violate CF. In order to cope with such circumstances, the theory allows for positions in which structural case is assigned in a complementary, derivation-saving, fashion, but, of course, that strategy implies that an NP that is caseless at D-S must be allowed to move to such positions, and that is the job of Move Alpha. Consequently, abstract Case reaches lexical NP's at either of two levels, (but not at both, by virtue of CF), D-S, if it is inherently projected onto them by the lexical head, according to the Projection Principle, or S-S, if the Case feature is structurally assigned. Of course, it follows that the Case requirement defined by CF cannot be enforced until after Move Alpha has given a Caseless NP the chance to acquire structural Case. The Case Filter, thus, holds at S-Structure.

CF is essentially a formal filtering device constraining derivations (particularly Move Alpha), and in such capacity it has shown considerable explanatory power. In other words, its fundamental import is the biuniqueness condition it enforces between Case features on the one hand, and lexical NP's on the other. On the contrary, issues such as the number of Cases, their appropriate labels, or even the list of Case assigners or structural Case-assigning contexts are relatively stipulative and of proportionally marginal interest in current GB research.

It is not my purpose, anyway, to assess the pro's and con's of the standard view and the competing proposals in the field, or to settle any of those issues, but only to look at the degree of fit and integration between the principles of Case Theory and some assumptions traditionally considered necessary to account for the facts of coordination. Therefore, for the purposes of the following discussion, I will consider the broad view of Case Theory assumed in standard GB syntactic practice as presented above to be correct. The discussion of coordination phenomena in the following sections, though, will supply evidence leading to certain revisions in Case Theory and in other components of the grammar.

**2. Coordination in generative grammar.** Coordination has always been, and to my knowledge remains to the present day, a relatively underdeveloped aspect of formal

grammar (cf. Dik 1968, Stockwell et al. 1973, Neijt 1979, Gazdar et al. 1982 or Van Oirsouw 1987 for fairly informative overall perspectives). Traditionally (cf. Quirk et al. 1985) two classes of coordination have been distinguished depending on the 'rank' of the coordinates: 'phrasal', and 'sentential' coordination. In the earliest TG grammars of English (Chomsky 1955, 1957, 1965, Gleitman 1965) all coordination is sentential and involves, first (Chomsky 1955, 1957), two generalized transformations (Conjunction and Conjunction Reduction), and then (Gleitman 1965, Chomsky 1965, etc.) a recursive schema  $S \rightarrow S^n$  and a transformation called 'Conjunction Reduction' (CR, in what follows) that joins constituents and deletes variables forwards and backwards indistinctly, at any point in the linear sequence. CR is a very powerful rule indeed, which accounts for a surprising variety of coordinated series of constituents, but, as research in TGG increased during the 1960's, there soon appeared examples that could not be adequately derived from sentential coordination (cf. Gleitman 1965, McCawley 1968, Lakoff & Peters 1969, Dougherty 1970-1 for relevant discussion). As it is beyond the scope of this article to go into the details that a full discussion of coordination would require, in what follows I shall refer just to cases directly relevant to the topic of this paper. The essential points, anyway, can be made on even the simplest coordination phenomena.

On the one hand, even in the 'favourable' cases of coordination, when the coordinates are syntactic constituents, not all the semantic interpretations required can be transparently derived from sentential coordination. To take the simplest examples first, whereas the 'segregatory' (Quirk et al.'s term) reading of expressions like (1) or (2) (i.e., the interpretation referring to two different piano-playing events, in the first case) seemed naturally represented in an underlying structure involving two sentences subsequently reduced by CR, the conjunctive reading (i.e., that referring to a single piano-playing event in which the two individuals 'John' and 'Mary' played the piano together, four hands) could not be transparently obtained from such an underlying representation.

- (1) John and Mary played the piano
- (2) John and Mary married

Secondly, and more decisively, under at the time current (i.e., Standard Theory) assumptions concerning semantic interpretation at deep structure (as Goodall 1987 pointed out, this would not be necessarily so in contemporary theories, in which semantic interpretation is effected at S-structure), no convincing readings at all could be derived from the sentential coordination account for certain classes of predicates. Well-known examples are cases like those in (3-7):

- (3) John and Mary are alike. (<\*John is alike and Mary is alike)
- (4) John and Mary are a settled couple. (<\*John is a settled couple and Mary is a settled couple)
- (5) John and Mary like each other. (<\*John likes each other and Mary likes each other)
- (6) John and Mary met in the library. (<\*John met in the library and Mary met in the library)
- (7) Two and two makes four. (<\*Two makes four and two makes four).Etc.

In order to account for such cases, Chomsky's Coordination and Conjunction Reduction rules and Gleitman's recursive PS rule  $S \rightarrow S^n$  plus her CR rule had to be

supplemented in the early sixties by rules of 'phrasal' coordination like NP → NP<sup>n</sup> (plus transformational insertion of **and**, cf. Lakoff and Peters 1969, McCawley 1968, Dougherty 1970-1971, etc.) or directly by rules base-generating coordinated strings, such as the more or less standard NP → NP ((and) NP)\*, which have remained in the grammar ever since. This mixed solution initially constituted what Dougherty 1970 labels the 'Conjunction Reduction Hypothesis' (CRH), as against his own 'Phrase Structure Rule Hypothesis' (PSRH), but the mixed strategy has remained in the field under versions that can no longer be identified with the CRH (e.g., Neijt 1979, Van Oirsouw 1982, 1987). Of course, as McCawley 1968 pointed out, since phrasal coordination schemata are required anyway, it is a moot point whether sentential coordination plus CR should be kept in the grammar as well. He drops CR by resorting to phrasal coordination and a suitable set of features, and so does Dougherty 1970-1, in a different way, but most treatments to the present day keep both devices, using phrasal coordination to account for cases like (3-7) and sentential coordination plus CR, among other rules (cf. *infra*), to deal with sentence coordination interpretations, on the one hand, and non-constituent coordinations, on the other (cf. Neijt and Van Oirsouw, *loc. cit.*), and some of them (e.g. Goodall 1987) may even be said to have dropped phrasal conjunction to the benefit of a sophisticated version of the CRH approach.

In fact, it is easy to show (see *infra* and Escibano 1991b), although not a priority in this paper, that the reductive strategy invariably depends on the use of syntactic-semantic features and can be adjusted to work both ways. Dougherty's objections to the CRH mainly refer to some obviously wrong reductionist extensions of the CR strategy, such as deriving surface plurals and collectives from underlying coordinated sentences, but such extensions are not a necessary component of the CRH approach, as amply demonstrated in later versions, and, if they are eliminated, Dougherty's critique loses most of its force. Obviously, the availability of two coordination devices, sentential and phrasal, introduces systematic derivational ambiguities which do not invariably correspond to semantic ones, so the question boils down to whether the overall derivational ambiguity is a reasonable price to pay for the capacity to explain facts like those of (1-7) above.

When alternative (conjunctive and segregatory) readings exist, as in (1) or (2), for example, the dual coordination strategy is undoubtedly attractive, as the conjunctive reading would be derived via phrasal NP coordination, whereas the segregatory one would be naturally obtained from the coordination and subsequent reduction of two underlying sentences. Thus, on the whole, the answer to the question of the duplicity of derivations has been positive, although Goodall 1987 and others find it suspicious and consider the mixed approach as one that unnecessarily enriches both the base component (by adopting a phrase structure schema that violates the 'single head' constraint of X-bar syntax) and the transformational one (since it rests on a bidirectional deletion rule without parallel in PF. (This last charge, of course, is controversial; cf. Van Oirsouw 1987).

The extra descriptive power gained with the introduction of phrasal coordination is nevertheless still insufficient to account for all the attested facts. Unfortunately, as Gleitman 1965 observed, there are many examples of coordination in which the surface coordinates are not even constituents, cf. (8-12), and which cannot properly be derived via either mechanism, although, if anything, they seem to imply that sentential coordination plus CR must exist, perhaps under a guise allowing for extremely powerful rules of deletion:

- (8) John ordered a salad and Mary, a pizza.

- (9) John writes, and Mary publishes, science fiction.
- (10) John bought Mary a scarf and Susan a handbag.
- (11) John considered Mary sexy, and Peter, Susan.
- (12) John bought, and Mary sent, Susan a book and Peggy a record.

(8) is a simple case of 'Gapping', and (11) a rather more complex one (cf. Ross 1970, Koutsoudas 1971, Jackendoff 1971, Maling 1972, Kuno 1976, Hudson 1976, Neijt 1979, Siegel 1984, Hudson 1989). Cases like (9), on the other hand, have traditionally been explained in terms of rules named '(Right) Node Raising', or 'Shared Constituent Coordination' (cf. Ross 1967, Bresnan 1974, Abbott 1976, Hudson 1976). Finally, cases like (10) and (12) remain controversial. They fall under Gapping (Neijt 1979), RNR, or extensions of CR in certain analyses (e.g., the generalized Coordinate Deletion rule defended by Van Oirsouw 1982, 1987), but require extra and widely diverging devices in others, to everybody's perpetual despair. In fact, to my knowledge, no satisfactory explanation has been offered for such examples, but the general trend is to resort to 'three-dimensional' analyses of coordination (cf. Williams 1978 and especially Goodall 1987) or to plainly abandon the formal properties of phrase structure (cf. McCawley 1982 and recent summary in Speas 1990) and adopt types of grammar that either ignore constituency (e.g. Hudson's WG as developed in Hudson 1984, 1988, 1989), or can construe the coordinated strings as constituents in a different sense ('truncated' or 'non-canonical' constituents, slashed categories, or Fregean functors) as in several types of categorial and combinatory grammars currently under development (cf. Gazdar et al. 1985, Sag et al. 1985 for the GPSG approach, and Dowty 1988, Wood 1988, or Steedman 1985, 1989, 1990 for various highly developed CG proposals).

However, for those of us who are skeptical concerning the eventual explanatory adequacy of both WG-style dependency grammar and the multi-dimensional or 'Fregean' approaches to constituency, the syntactic devices available to generate the relevant structures are essentially as defined twenty years ago except for certain notational changes aiming at greater generalization. Coordinated structures continue to be licensed by X-bar schemata like  $X \rightarrow X ((\text{and}) X)^*$ , or variations thereof, as in Dougherty 1970, and so-called sentential coordination now falls naturally as a special case under such general schemata, i.e., that in which X is a sentence, but nothing, to my knowledge, has so far replaced CR in the derivation of **respectively** sentences, or Right Node Raising and Gapping in the derivation of non-constituent coordination (cf. Hankamer 1979, Chao 1987, Goodall 1987, Van Oirsouw 1987, Neijt 1979, 1989 for some discussion). Thus, the task of constraining the system to achieve at least descriptive adequacy is largely entrusted to a few general principles specifically designed to handle coordination phenomena, such as Ross's 'Coordinate Structure Constraint' (Ross 1967), the different formalizations of the intuitive idea that coordinates must be 'of the same type', such as Schachter's 'Coordinate Constituent Constraint' (Schachter 1977), Williams's 'Law of Coordination of Likes' (Williams 1978, 1981) or equivalent concepts in GPSG and other generative traditions, and above all to the filtering effect that the various interacting systems of principles of GB theory may have on the overgenerating syntactic coordination schemata.

However, as far as I know, beyond occasional remarks (e.g. in Goodall 1987, Woolford 1987) no systematic attempt has been made to integrate coordination within that framework. It is not beside the point, therefore, to explore the question whether the traditional syntactic devices can be integrated in the new theory or not, and the conceptual constraints such integration may impose on other modules. Needless to say, it is beyond the scope of this paper to attempt to provide a full theory of coordination, so

I will limit myself to a few fairly obvious remarks that suggest the tenor of the revisions that may be needed.

**3. Coordination and Case Theory.** On the one hand, Case Theory is potentially a means to filter out in a principled way certain kinds of overgeneration by the syntactic coordination devices. The obvious instance of this is the fact that, given standard 'percolation' conventions (or equivalent GPSG devices, etc.), any coordinated series of NP's bearing non-identical case features is automatically (and correctly) forbidden, cf. (1):

- (1) a. \*I saw she and him  
b. \*I'll sit between he and her  
c. \*Her and I do not agree

The explanation follows straightforwardly from several interpretations of Case Theory that are more or less notational variants in this respect. For example: if Case is assigned to the mother NP node by its governor, either the mother receives two conflicting Case features (violating the Case Filter), or there is no way for the daughter NP's to inherit them, and even if the mother NP node could have two Case features, the subtree it would form with two coordinate NP daughters bearing different Case specifications would violate standard feature-transmission principles. Goodall 1987: 48 and Hudson 1989:61-62, incidentally, point out the existence of grammatical subjects like **she and him**, **Mary and me**, etc. and maintain that such forms are preferred by many speakers in certain dialects. To the extent that this is correct, Case Theory faces an obvious problem. However, such phenomena are, if anything, exceptional, and should not be considered relevant at the level of UG theorizing, for various reasons: first, they do not seem to appear in other languages (Spanish, German); then, careful speakers of standard English avoid case mismatch anyway, and there is a widespread consensus, perhaps derived from prescriptive grammar, that the 'correct' form is nominative in both conjuncts; and last, the unexpected case forms seem to occur only after the conjunction, which opens alternative possibilities in the analysis of coordinated structures. For example, **and** might be a governor (a kind of preposition, close to **with** in meaning) and consequently an objective Case-assigner in those dialects. Alternatively, the morphologically objective surface form could be construed as just a context sensitive realization of an abstract nominative Case, and there are still other possibilities. We shall assume, therefore, that Case match is the rule in conjuncts, under the usual percolation conventions. That licenses straightforward cases of NP coordination like **Mary and I did it**, **She invited John and me**, etc., and correctly excludes the ungrammatical coordinations of (1).

CF, on the other hand, can easily account for many of the ungrammatical examples derived from lack of syntactic parallelism captured by Williams's ATB convention (cf. Williams 1978, 1981). For example, given CF and the usual well-formedness conditions on chains (cf. Chomsky 1981), nothing need be added to the grammar to prevent cases like (2-4), since, by being the antecedent of two different traces both in case-marked positions, the **wh** phrase will inherit two incompatible Case features, nominative and accusative in (2-3), accusative and oblique in (4), and thus will be automatically excluded by CF in all of them:

- (2) \*Who did you see t and t saw you?  
(3) \*Who did you see Mary with t and t insulted you?

- (4) \*Who did you see t and did Mary dance with t ?

However, as soon as we venture into less straightforward cases of coordination, the satisfaction of Case Theory and CF becomes more problematic. For instance, even in a simple sentence like (5), both NP's arguably violate CF: the subject, by being doubly Case-marked as nominative by the two INFL nodes, and the object by receiving accusative Case twice, from the verbs **wash** and **iron**, respectively:

- (5) She washes and irons my shirts.

(5) may be reconciled with CF in either of two ways, depending on whether it is derived by phrasal coordination or by sentential coordination plus CR. (As we shall see, the Case issues resulting from coordination are inextricably related to the syntactic and semantic ones referred to in section 2 above and call for different theoretical adjustments depending on how we settle them). If (5) is a case of CR, all we need to say is that CR is a PF rule deleting constituents under identity (in a sense to be defined below). At D-S and S-S, then, (5) will correspond to two sentences, there will be two instances of each of the NP's, each will receive nominative or accusative Case, as required, from its respective governor, and no CF violation will arise.

Alternatively, if (5) is generated by phrasal coordination at V and VP (or I') level, only one NP subject and one NP object will be available to absorb the double Case features, but we can prevent the CF violation by assuming that coordinated Case assigners assign Case only once, under 'unification' of their projected Case features (provided such unification is possible, i.e., when the projected Cases coincide). The principle required might be stated as follows:

- (6) Case Unification Principle: Non-distinct Case specifications projected onto a single NP by the C-grids of coordinated Case-assigners must be unified.

CUP would be added to the usual percolation principles and would block double or multiple Case marks on a single NP in any position where it is governed and Case-marked by a well-formed coordinate node. Of course, this strategy might call for a similar approach to  $\theta$ -Marking and a corresponding adjustment of the Projection Principle and the  $\theta$ -Criterion. Roughly, the parallel thematic principle needed is (7):

- (7) Thematic Unification Principle: Non-distinct non-saturated features of  $\theta$ -grids projected by coordinated  $\theta$ -markers onto a single NP must be unified.

TUP allows a single c-commanding NP to discharge identical  $\theta$ -role features projected by all the coordinates dominated by its governing node and, of course, violates the  $\theta$ -Criterion (cf. Chomsky 1981:139, fn. 15). However,  $\theta$ -Theory may (and, in fact, must) be reinterpreted in such a way that TUP is not really needed (cf. Escribano 1991b, this volume and Escribano 1991a or Speas 1990 for the general 'bottom-up' syntactic approach implied), so we assume it here provisionally, just for the purposes of the present discussion. Anyway, CUP and TUP would account for (5) under a phrasal coordination analysis.

This approach could be naturally extended to avoid apparent CF violations in the object NP in cases of RNR like (8) provided they could be derived by phrasal coordination, as they are in GPSG (cf. Gazdar et al. 1985, Sag et al. 1985, etc.):

(8) John writes, and Mary publishes, science fiction.

Unfortunately, slashed categories like S/NP are impossible under standard TGG assumptions, and that has traditionally forced TG grammarians to account for RNR constructions starting from a coordination of two full sentences at D-S and S-S. That complicates things enormously, however, because, among other things, the surface strings apparently coordinated in (8) are not canonical constituents. If two maximal projections are involved, the Projection Principle requires the object NP to be present after each of the verbs at D-S, and since the comma intonation points to the existence of gaps or deletion sites, we must assume an ATB extraction of the subject at some point between D-S and S-S, but that produces an ill-formed chain \***t...t ... science fiction** in which the two traces will occupy case-marked positions and transmit a double accusative Case feature to their antecedent in violation of CF, so either we forget about Move Alpha and adopt the phrasal coordination plus CUP and TUP in these cases too, or a complementary case unification principle CUP II (or a second clause in (8)) will have to be added. Again, roughly, (9):

(9) Case Unification Principle II: Non-distinct Case features transmitted by traces bound by the same operator must be 'unified'.

Gapping cases like (10) pose still different Case problems. Again, under standard classical TG and GB assumptions, only the sentential coordination derivation is available in such cases. Thus, in order to satisfy the CF, (10) must contain two deep sentences and two instances of the verb (with their respective INFL nodes attached to them after 'Affix Movement' at S-S) and we must assume that the second instance of **ordered** assigns nominative and accusative Case, respectively, to the NP's **Mary** and **a pizza** before being deleted by Gapping at PF. (Incidentally, that commits us to a deletion, instead of an interpretive, or a replacive analysis of Gapping, since EC's are not Case-assigners).

(10) John ordered a salad, and Mary a pizza.

The phrasal coordination alternatives to generate (10) are just too complicated, syntactically speaking, to merit serious consideration in current GB grammar. One that would lead to a S-S representation satisfying CF would be to start from a deep [+respectively] sentence **John and Mary ordered a salad and a pizza** (cf. Dougherty 1970-1, Stockwell et al., 1973) and to have one or more transformational rules capable of restructuring it into two, type-raising the conjunction, and obligatorily moving the conjuncts **Mary** and **a pizza** rightwards, in that order. Of course, there is no principled way to make transformational operations obey restrictions of that kind within the constrained theories of Move Alpha currently in use, so we may as well forget this strategy.

The syntactic derivation of complex examples of CR, RNR and Gapping like those of (10)-(12) in section 2 above is quite problematic in itself and exceeds the scope of this article, so until a satisfactory syntactic solution is found, there is no point in speculating about the Case problems involved and the approaches available for their resolution. In principle, there is no reason why they should be different in kind from those posed by (8) and (10), but there are too many options open and I shall not discuss them here in detail. Instead, I will consider other cases of coordination which are

syntactically straightforward and yet raise further Case problems generally overlooked in the literature.

For example, under standard assumptions, CF should prevent **who** and **how many of you** from being associated with the two traces left under the coordinate sentences of (11-12), since that association implies that the **wh** item receives nominative Case twice. Yet, of course, both sentences are perfectly grammatical:

- (11) Who *t* came and *t* seemed *t* to enjoy himself?
- (12) How many of you *t* teach and/or (*t*) are being taught (*t*) by computer-assisted methods?

Needless to say, cases involving NP Movement in passive and raising contexts, but not WH-Movement, like (13-14), produce exactly the same difficulties:

- (13) John greeted everybody and was greeted *t* back by hundreds of people.
- (14) John drank a lot and seemed *t* to be enjoying himself enormously.

Again, the Case questions at issue interact in obvious ways with the duality of coordination devices in the grammar discussed in section 2 above, and call for different theoretical adjustments depending on which is involved, so we must first settle whether the Case conflicts arise from phrasal coordination, from sentential coordination, or from both. All the examples in (11-14) have standard sentential coordination derivations, but none can be alternatively derived by phrasal coordination. The problem, of course, is that phrasal coordination is a D-structure phenomenon, and at that level the conjuncts needed to account for the surface forms are not yet available, as they imply transformational operations. Thus, in order to derive (11-14) by phrasal coordination under a standard analysis of passive and raising constructions, the D-S representations corresponding to (11-14) would have to be, irrelevant details omitted, (11-14'):

- (11') Who came and seemed **who** to enjoy himself.
- (12') How many of you teach and are being taught **how many of you** by computer-assisted methods?
- (13') John greeted and was greeted **John** back by hundreds of people.
- (14') John drank a lot and seemed **John** to be enjoying himself enormously.

Obviously, (11'-14') do not yield adequate surface forms as they are, but, above all, there is no way to move the second NP **who**, **how many of you** or **John**, respectively, from its underlying position without violating Move  $\alpha$  (the Structure Preserving Constraint), the Case Filter and the  $\theta$ -Criterion, so, in order to adopt a phrasal coordination approach in those cases, the standard analysis of passives and raising verbs would have to be modified, surely too high a price to be paid. Therefore, the only derivational strategy consistent with the standard analysis is sentential coordination plus deletion (i.e., CR). Provided that at S-S there are two sentences and two NP's each receiving case independently from a different INFL node, CF will not be violated. All we have to do, therefore, is to allow for the deletion of the second NP under identity. If we assume that the PF CR deletion rule is sensitive to Case features, we obtain the right predictions. As the Case features assigned to both NP's in (11-14) coincide (i.e., nominative), the PF rule would delete the second NP as required.

That hypothesis, on the other hand, excludes an alternative derivation of (2-4) that we have not forbidden so far, but must be excluded. The standard analysis of

ungrammatical examples like (2-4) above, as we said, is sentential coordination followed by ATB extraction of the WH item, and we said that the chains resulting from such derivations are ill-formed, but the ungrammatical (2-4) could in principle be derived by sentential coordination followed by deletion of the second WH item by CR. However, by assuming a CR deletion rule sensitive to Case features, we automatically block those derivations: provided the Case specifications on the two instances of **who** at S-S are visible to the PF rule, the two NP's will not be identical in the relevant sense and no deletion will take place. Thus, the derivations licensed by the grammar will yield only the unreduced (2'-4'), which do not produce CF violations, but not (2-4), which do:

- (2') Who did you see t and who t saw you?
- (3') Who did you see Mary with t and who t insulted you?
- (4') Who did you see t and who did Mary dance with t ?

Thus, apparently, we have reconciled Case Theory with the facts of coordination at a very low cost so far, essentially by keeping the two traditional syntactic coordination strategies, providing for the 'unification' of Case features by CUP, and making the PF deletion-under-identity rule sensitive to Case specifications. However, there are certain indications suggesting that the CR strategy may not be correct, after all, for cases like (2-4) or, crucially, for those in (11-14).

The pairs (2-4) (2'-4') provide an obvious hint in this respect. Notice that the reduced versions are ungrammatical, whereas the unreduced ones are fine. In other words, under that hypothesis, CR is responsible for a difference in grammaticality. Yet, PF rules are generally assumed to be completely neutral in this respect, i.e., their input and output are grammatical anyway, and therefore they are always optional. In other words: in order to operate as needed to account for such pairs, CR would have to be an exception among all the PF rules.

On the other hand, PF rules are also generally assumed to have no effects on semantic interpretation, as required by the T-model of GB grammar (recall that semantic interpretation is read off S-Structure via LF; if PF rules had semantic consequences, they would remain inaccessible to the interpretive rules). However, if we assume the CR hypothesis, as we must do for (11-14), the underlying S-structures reconstructed in the corresponding derivations are not semantically equivalent to their would-be surface (=PF) counterparts. Thus, the unreduced forms in (2'-4') (11"-14") imply different reference for the two occurrences of the subject, whereas the original reduced examples (2-4) (11-14) do not:

- (11") Who came and who seemed to enjoy himself?
- (12") How many of you teach and how many of you are being taught by computer assisted methods?
- (13") John greeted everybody and John was greeted t back by hundreds of people.
- (14") John drank a lot and John seemed t to be enjoying himself enormously.

Thus, the sentential coordination plus PF deletion-under-identity strategy akin to the CR rule has at least two serious drawbacks. Contrary to all other PF deletions, the one involved in CR a) is an unexpected source of ungrammaticalness in certain cases, and b) has semantic consequences, since it leads us to expect disjointness, where the common sense interpretation requires identity, of reference. Of course, since a phrasal coordination analysis, by definition, provides only one NP, such problems do not arise, but others do. Unfortunately, as pointed out above, the alternative of assuming base-

generated phrasal coordination plus just one 'shared' NP is not available under current GB assumptions for most of the examples discussed. In particular, under a Move  $\alpha$  analysis it yields the wrong predictions in cases of coordination of passives and raising verbs like (11-14), as we saw. Therefore, there seems to be no satisfactory way, so far, to conciliate the overall syntax and semantics of coordination with the abstract Case needs of the GB framework.

However, it might be possible to account for all the facts discussed above without CR by changing certain standard assumptions. Granted the usual X-bar schema for the coordination of phrases in general, including CP and C', and the standard conventions on chain formation, Case, etc., plus the Case Unification Principle, ungrammatical cases like (2-4) can be excluded straightaway, as we said. Similarly, we have already provided well-formed phrasal coordination derivations satisfying CF for grammatical cases like (5) and (8): Provided we can freely conjoin even unsaturated verbal projections, all we have to assume in (5) is that, according to the CUP, the two unsaturated verbal predicates **wash** and **iron** project a single nominative Case feature and a single accusative Case feature, assigned to the NP's **she** and **all my shirts**, respectively. Parallel assumptions account for the simple RNR case of (8). The real problems so far, thus, leaving aside the complex RNR, Gapping and CR phenomena we have deliberately ignored pending a coherent syntactic solution, arise in cases like (11-14).

The reason why cases like (11-14) could not be obtained by deep phrasal coordination under current assumptions was that the predicates needed must be derived by Move  $\alpha$ . Indeed, if we assume the D-structures of (11'-14'), there are several reasons why the corresponding surface structure cannot be derived. In a case like (11), for example, a) **seem** will have to be associated with a deep subject (the higher **who** shared with the predicate **came**) in violation of the Projection Principle, b) since the subject position shared by both tensed verbs is already occupied by the higher **who**, there is no empty Case-marked NP slot into which the 'lower' and Caseless **who** functioning as deep subject of **enjoy himself** can move, and c) consequently, the 'lower' **who** will remain in place and Caseless, in violation of CF.

The difficulty, however, stems largely from the nature of Move  $\alpha$  and the physical constraints on movement. Yet, we need not take Move  $\alpha$  as literally implying 'movement' of constituents, and, if we abandon that hypothesis, the obstacle disappears. Let's assume, then, that at D-S the Projection Principle generates a suitable number of NP's which may be lexical or empty (among these at least PRO, small pro and t, as allowed by current conceptions of UG) and that the grammar simply requires that such choices be licensed at the appropriate levels by the different systems of principles of GB. For instance, if we place a lexical NP like **who** as the underlying subject of **enjoy** in (11) it will violate CF. On the contrary, if we choose one of the EC's, no such case violation will ensue, but the EC will have to satisfy other conditions. For example, PRO is impossible in such a context, since a) the subject position is governed by **seemed**, b) that would require two chains, instead of one, in violation of the Projection Principle, and c) the WH operator must bind a variable, and PRO is not a variable. Small pro, in its turn, is impossible as underlying subject of **enjoy** for partially overlapping reasons, i.e., a) it must occupy a Case-marked position, and the subject of **enjoy** is not Case-marked, b) it, too, projects an independent chain which would violate the Projection Principle, c) it must be free in its GC, and d) it does not supply the variable the WH operator requires. That leaves us with trace as the only possibility in the current standard inventory of ECs, but trace results from Move  $\alpha$  and, as we saw, Move  $\alpha$  violates other conditions in (11-14).

Now, suppose that there is no movement, and that an EC (we may call it 'trace', since it has exactly its properties) co-indexed with the antecedent **who** is in the subject position of **enjoy** from the start (and similarly for the other cases under discussion). In that case, the Projection Principle is satisfied at D-S and at all subsequent levels, but there is no extra lexical NP without Case, nor double Case-marking of **who** (by virtue of CUP), and therefore there is no CF violation. Provided the EC is properly identified by a suitable antecedent, the resulting configuration will be legitimate. Of course, since there is no Move  $\alpha$ , the standard explanation for the absence of lexical NP's as subjects of infinitives in raising environments and objects of passive verbs must be abandoned. It is not that the underlying lexical NP must be moved 'in search of case', but that such an NP cannot be licensed in that position anyway, and there is no other. Correspondingly, the relation between D-S and S-S loses its 'dynamic' character. Properly, the grammar will now contain simultaneous and logically distinguishable sets of conditions that we may choose to call D-S and S-S, but not 'derivations': S-S, in other words, will not be a representation 'derived' from D-S.

As suggested above, in order to integrate this account in the overall GB framework, we must change certain details concerning the well-formedness of chains. Notably, we must allow for the 'unification' of the non-conflicting Case specifications by CUP, so that only one Case feature is assigned to each NP when governed (directly, or indirectly, through the trace) by coordinated series of Case assigners. We also have to adjust Theta Theory and the Projection Principle in a parallel way (cf. Escribano 1991b, this volume). Under such assumptions, the phrasal coordination NP-sharing strategy accounts for the crucial facts just as well as the CR approach, without Case Theory violations, and, crucially, without the undesired semantic and grammaticality status effects observed under the CR hypothesis.

In sum, the sentential coordination plus CR strategy, although more firmly grounded in the TG tradition and apparently easier to adapt to the empirical and theoretical needs imposed by Case Theory, has turned out to be impracticable for semantic reasons in many of the crucial examples and we have had to use a phrasal coordination NP-sharing approach instead. That move, however, has required certain adjustments in the current standard conception of Move Alpha, and the conventions governing Case assignment and transmission:

1) Move  $\alpha$  is just an attractive metaphor. In fact, no NP 'movement' takes place. Instead, what we do require is pairs (and in general, sets, or 'chains') of lexical NP's and EC's, the first properly Case-marked, and the second properly identified. D-structure and S-structure, therefore, are best understood as isolatable sets of 'static' or 'declarative' conditions, and the 'dynamic', derivational, relationship between those two 'levels' of representation can be dispensed with at no cost.

2) Case assigning heads have associated C-grids in their lexical entries that must be properly 'discharged' in the projection process. One of the consequences of the CUP is that the C-grid requirements fixed for heads by the Projection Principle in coordinated structures can be jointly discharged for all the coordinates by complements successively adjoined to the mother node. Given two verbal projections V1 and V2 with associated (partially) undischarged non-distinct Case-grids {C1... C2... C3...}, the mother node dominating V1 and V2 when joined by phrasal coordination will inherit exactly the same C-grid (via percolation and unification) and will be affected by the Projection Principle in exactly the same way as each of the coordinates would if found in isolation, i.e., the undischarged Case features will be gradually cancelled (and appropriately marked with asterisks) as suitable c-commanding NP arguments absorbing them join the projection.

3) Conversely, an NP governed by two or more coordinated Case-assigning nodes with unifiable C-grids will receive only one Case specification and will not violate CF.

4) Case is directly assigned to lexical NP's and indirectly passed onto them through their traces in Case-marked positions. However, as a consequence of CUP I & II, a lexical NP may be directly and indirectly C-marked at the same time without violating CF provided the Case features involved may be unified, as in (11-14). In other words, indirect C-marking via a chain of traces is a default mechanism with consequences only when the NP does not independently receive Case in its surface position. If the lexical NP antecedent is properly Case-marked, the trace does not transmit a second Case feature. All that is required is that the case features of NP and EC not be in conflict and can be merged or 'unified'. On the contrary, if the trace receives one Case feature and the NP is assigned a different one, the unification mechanism does not work and a CF violation ensues, as in (2-4) above. This implies that cases like **\*Who seems that t is enjoying himself** is not a Case Filter violation, but an ECP violation, as standardly assumed.

## References

- Abbott, B., 1976: 'Right Node Raising as a test for constituent-hood'. *Linguistic Inquiry*, 7/4, pp. 639-642.
- Baker, M.C., 1989: 'Object sharing and projection in serial verb constructions'. *Linguistic Inquiry*, 20/4, pp. 513-553.
- Bresnan, J. W., 1974: 'The position of certain clause particles in phrase structure'. *Linguistic Inquiry*, 5/4, pp. 614-619.
- Chao, W., 1987: *On Ellipsis*. New York: Garland.
- Chomsky, N., 1955: *The Logical Structure of Linguistic Theory*. New York: Plenum Press, 1975.
- Chomsky, N., 1957: *Syntactic Structures*. The Hague: Mouton.
- Chomsky, N., 1965: *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.
- Chomsky, N., 1980: 'On Binding'. *Linguistic Inquiry*, 11/1, pp. 1-46.
- Chomsky, N., 1981: *Lectures on Government and Binding*. Dordrecht: Foris.
- Chomsky, N., 1986a: *Barriers*. Cambridge, MA: MIT Press.
- Chomsky, N., 1986b: *Knowledge of Language*. New York: Praeger.
- Dik, S. C., 1968: *Coordination: Its Implications for the Theory of General Linguistics*. Amsterdam: North Holland Publishing Co.
- Dougherty, R., 1970-71: 'A grammar of coordinate conjoined structures'. *Language* 46/4, pp. 850-900; *Language* 47/2, pp. 298-339.
- Dowty, D., 1988: 'Type-raising, functional composition and non-constituent coordination'. In R.T. Oehrle, E.W. Bach & D. Wheeler, eds., *Categorial Grammars and Natural Language Structures*. Dordrecht: Reidel, pp. 153-198.
- Escribano, J. L. G., 1991a: *Una Teoría de la Oración*. Universidad de Oviedo, Servicio de Publicaciones.
- Escribano, J. L. G., 1991b: 'Coordination,  $\theta$ -theory and the  $\theta$ -criterion'. This volume.
- Fillmore, Ch. J., 1968: 'The Case for Case'. In E. W. Bach & R. T. Harms, eds., *Universals in Linguistic Theory*. New York: Holt, pp. 1-88.
- Gazdar, G., 1981: 'Unbounded dependencies and coordinate structure'. *Linguistic Inquiry*, 12/2, pp. 155-185.
- Gazdar, G. et al., 1982: 'Coordination and transformational grammar'. *Linguistic Inquiry*, 13/4, pp. 663-676.

- Gazdar, G., E. Klein, G. Pullum & I. Sag, 1985: *Generalized Phrase Structure Grammar*. Oxford: Basil Blackwell.
- Gleitman, L., 1965: 'Coordinating conjunctions in English'. *Language* 41/2, pp. 260-293
- Goodall, G., 1987: *Parallel Structures in Syntax*. Cambridge: Cambridge University Press.
- Hankamer, J., 1979: *Deletion in Coordinate Structures*. New York: Garland.
- Hudson, R., 1976: 'Conjunction Reduction, Gapping and right Node Raising'. *Language*, 52/3, pp. 535-562.
- Hudson, R. A., 1988: 'Coordination and grammatical relations'. *Journal of Linguistics*, 24/2, pp. 303-342.
- Hudson, R. A., 1989: 'Gapping and grammatical relations'. *Journal of Linguistics*, 25/1, pp. 57-94.
- Jackendoff, R., 1971: 'Gapping and related rules'. *Linguistic Inquiry*, 2/1, pp. 21-35.
- Koutsoudas, A., 1971: 'Gapping, conjunction reduction and coordinate deletion'. *Foundations of Language*, 7, pp. 337-386.
- Kuno, S., 1976: 'Gapping: a functional analysis'. *Linguistic Inquiry*, 7/2, pp. 300-318.
- Lakoff, G. & S. Peters, 1969: 'Phrasal conjunction and symmetric predicates'. In Reibel, D.W. & S. B. Schane, eds., *Studies in English Transformational Grammar*. New York: Holt.
- Maling, J., 1972: 'On gapping and the order of constituents'. *Linguistic Inquiry* 3/1, pp. 101-108.
- McCawley, J. D.: 'The role of semantics in a grammar'. In E.W. Bach & R. T. Harms, eds., *Universals in Linguistic Theory*, New York: Holt, pp. 124-169.
- McCawley, J. D., 1982: 'Parentheticals and discontinuous constituent structure'. *Linguistic Inquiry*, 13/1, pp. 91-106.
- Neijt, A., 1979: *Gapping*. Dordrecht: Foris.
- Neijt, A., 1989: Review of R. R. van Oirsouw 1987, *The Syntax of Coordination*. *Lingua* 78/4, pp. 343-356.
- Quirk, R., S. Greenbaum, G. Leech & J. Svartvik, 1985: *A Comprehensive Grammar of the English Language*. London: Longman.
- Ross, J. R., 1970: 'Gapping and the order of constituents'. In Heidrich, et al. eds., *Progress in Linguistics*, The Hague: Mouton, pp. 249-259.
- Rouveret, A. & J. R. Vergnaud, 1980: 'Specifying reference to the subject: French causatives and conditions on representations'. *Linguistic Inquiry*, 11/1, pp. 97-202.
- Sag, I. A., 1979: *Deletion and Logical Form*. New York: Garland Publishing Co.
- Sag, I. A., G. Gazdar, T. Wasow & S. Weisler, 1985: 'Coordination and how to distinguish categories'. *Natural Language and Linguistic Theory*, 2/3, pp. 117-171.
- Schachter, P., 1977: 'Constraints on coordination'. *Language* 53/1, pp. 86-103.
- Speas, M. 1990: *Phrase Structure in Natural Language*. Dordrecht: Kluwer Academic Publishers.
- Steedman, M., 1985: 'Dependency and coordination in the grammar of Dutch and English'. *Language*, 61/3, pp. 523-568.
- Steedman, M., 1989: 'Constituency and coordination in a combinatory grammar'. In M. R. Baltin & A. S. Kroch, eds., *Alternative Conceptions of Phrase Structure*, Chicago: The University of Chicago Press, pp. 201-231.
- Steedman, M., 1990: 'Gapping as constituent coordination'. *Linguistics and Philosophy*, 13/2, pp. 207-263.
- Stillings, J., 1975: 'The formulation of Gapping in English as evidence for variable types in syntactic transformations'. *Linguistic Analysis*, 1/2, pp.247-274.

- Stockwell, R. P., P. Schachter & B. H. Partee, 1973: *The Major Syntactic Structures of English*. New York: Holt.
- Van Oirsouw, R. R., 1982: 'Coordinate deletion and n-ary branching nodes'. *Journal of Linguistics*, 19/2, pp. 305-319.
- Van Oirsouw, R. R., 1987: *The Syntax of Coordination*. London: Routledge, Croom Helm Linguistic Series.
- Williams, E. S., 1978: 'Across the board rule application'. *Linguistic Inquiry*, 9/1, pp. 31-43.
- Williams, E. S., 1981a: 'Transformation-less grammar'. *Linguistic Inquiry* 12/4, pp. 645-653.
- Wood, M., 1988: *A Categorical Syntax for Coordinate Constructions*. London: University College Ph. D. Diss.
- Woolford, E., 1987: 'An ECP account of constraints on Across-the-Board extraction' *Linguistic Inquiry* 18/1, pp. 166-171.