ADJUNCTION AND ANTECEDENT-CONTAINED DELETION

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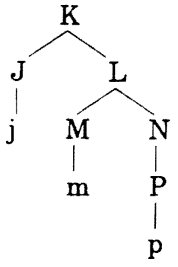
1.0 INTRODUCTION

In this paper I would like to address some asymmetries in the behavior of antecedent-contained deletion sentences with respect to arguments and adjuncts. The context for the discussion is a set of recent proposals by Kayne (1994) and Chomsky (1994) which seek to derive phrase structure from more general properties of the computational system. Among the empirical consequences of these proposals which deserve careful scrutiny are the following: (i) adjunction is allowed only on the left, and (ii) the distinction between segments and categories (see May 1985, Chomsky 1986) is lost. Conclusion (i) especially warrants investigation, given the preponderance of phenomena which seem to involve rightward movement (e.g. extraposition) and the fact that in SVO languages adjuncts commonly appear at the right periphery of phrases. Kayne (1994) takes great pains to reanalyze many of these phenomena in light of the conclusions in (i-ii). However, some phenomena do not seem amenable to such reanalysis. Below I will show that certain constructions involving antecedent contained deletions suggests that the conclusions above are insupportable, and hence Kayne's proposal may be too strong.

2.0 KAYNE'S (1994) LINEAR CORRESPONDENCE AXIOM

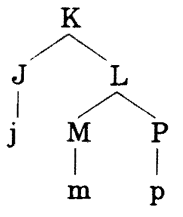
Kayne (1994) proposes to derive X-Bar theory, in effect eliminating phrase structure as a primitive of the theory of grammar, by imposing a strict condition on the linear ordering of terminal elements in a phrase marker, such that linear precedence corresponds to asymmetric c-command. Intuitively, the proposal means that in a given string, constituents which are farther to the right (graphically) must be asymmetrically c-commanded by constituents farther to the left. To see how this works, consider the phrase marker in (1):

(1)



From this phrase marker we can construct a set A of ordered pairs of non-terminal elements such that the first asymmetrically c-commands the second. The set is A={ <J,M>, <J,N>, <J,P>, <M,P>}. Now we can construct a second set d(A), the *image* of A, which is comprised of the set of ordered pairs <x,y> of terminals such that for some pair <X,Y> in A, x is dominated by X and y is dominated by Y. Thus d(A) for the given A here is d(A)={<j, m>, <j, p>, <m, p>}. Note now that if we interpret <x,y> ∈ d(A) to mean that x precedes y, then d(A) completely determines the order of terminals for the phrase marker in (1). Now consider a structure such as (2), where the complex category N has been replaced by a head:

(2)



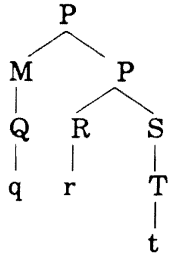
The set A for this structure is A={<J,M>, <J,P>}, and d(A)={<j,m>, <j,p>}. Note that here the linear ordering of the terminals is not completely determined, because since M and P both c-command each other, neither asymmetrically c-commands the other. Thus, no order can be specified between m and p. Kayne's proposal is that structures such as (2), for which the linear ordering of terminals cannot be completely determined, are inadmissible. This is ensured by the Linear Correspondence Axiom:

(3) Linear Correspondence Axiom (LCA):
For any phrase marker T, d(A) is a total ordering of T.

Structures for which condition (3) is not met are not admissible structures. Note that this condition predicts a universal Specifier-Head-Complement order, since specifiers asymmetrically c-command the head and complement of their phrase, and heads asymmetrically c-command their complements (and asymmetric c-command corresponds to linear precedence). This condition also gives us result (i) above, because any right-adjoined element will asymmetrically c-command into the material on its left, in violation of (3).

One immediate problem that arises is that if we take the admissible structure in (1) to be a projection of m (so that L=M' and K=M''), then we have a maximal projection with a non-maximal projection in its specifier, contrary to the usual assumptions of X-bar theory. To deal with this problem, Kayne proposes a slight modification of the definition of c-command such that structures such as (4) will be admissible under the LCA:

(4)



Here we take P to be a projection of r, and M adjoined to P. Under standard definitions of c-command, (4) violates the LCA. The reason is that while M asymmetrically c-commands R and S (giving us <q,r> and <q,t> in d(A)), the lower P also asymmetrically c-commands Q (giving us <r,q> and <t,q>). Since the set d(A) contains the contradictory orderings <q,r> and <r,q> (as well as <q,t> and <t,q>) it cannot constitute a total ordering of the structure.

To deal with this problem, Kayne draws on the distinction between categories and segments (May 1985, Chomsky 1986). In a structure like (4), in which M is adjoined to P, the category P is "split" into two segments, neither of which is a category on its own. Kayne's suggestion is that we let c-command hold only between categories, and not between individual segments of categories:

(5) X c-commands Y iff *X and Y are categories* and X excludes Y, and every category that dominates X dominates Y.

This proposal is in accord with Chomsky's (1994) suggestion that intermediate projections are invisible to the computational system. The lower P in (4) would be an intermediate (single-bar) projection for Chomsky--for Kayne it is a segment, i.e. not a category. Under (5), since the lower P cannot enter into c-command relations by virtue of its status as a segment, the pair <P,Q> is not in the set A for this structure. Now A={<M, R>, <M,S>, <M,T>, <R,T>}, so that d(A)={<q,r>, <q,t>, <r,t>}, a total ordering of (4), in compliance with the LCA. Note, however, that while Kayne's definition of c-command crucially refers to a distinction between segments and categories, that distinction is quite different from the one assumed in May (1985), Chomsky (1986) and later work. The more traditional distinction between segment and category was used to distinguish between phrase-internal positions (specifiers and complements) and adjoined positions. Specifically, specifiers and complements were assumed to be dominated by all segments of the category in which

they are contained (hence *dominated* by the category), while adjuncts were assumed to be dominated only by some segment(s) of the category to which they are adjoined (hence *included* in, but not dominated by, the category). There was thus a distinction in structural terms between specifier and adjoined positions. In Kayne (1994) that distinction has been lost (conclusion (ii) above). For Kayne, specifiers are simply another case of adjunction, so that all non-minimal projections are segments, and there are no intermediate (X') projections.

3.0 THE PROBLEM: ANTECEDENT-CONTAINED DELETION

Given these conclusions, let us turn to some apparent examples of rightward-attachment to see whether they can submit to a reanalysis in terms which will bring them into compliance with the LCA. Specifically, I would like to examine instances of antecedent-contained deletion (ACD) which involve constituents to the right of the deletion site. Consider the pair of ACD sentences in (6):

(6) a. John gave a box of girl-scout cookies to everyone he could [e].
b. John gave to everyone he could [e] a box of girl-scout cookies.

The central mystery surrounding such sentences, first noted in Bouton (1970), is this: if we suppose that null VPs such as those given by *e* in (6) are truly empty and receive their interpretation via copying of an antecedent VP at LF, then the null VPs in (6) cannot be interpreted if left *in situ* because they are contained inside their antecedent. Copying of the antecedent VP would yield another instance of the ellipsis, which would in turn need interpretation via copying, leading to an infinite regress: *John gave to everyone he could give to everyone he could give to everyone*. . . etc. To escape this problem, it has usually been assumed that in order for the null VP to receive an interpretation in the above sentences, the clause containing it must get outside of the matrix VP by LF, by means of either Quantifier Raising (QR) (May 1985), extraposition (Baltin 1987), or A-movement to Spec-AgrO (Hornstein 1994, Lasnik 1993). The exact mechanism is not important here, so for the sake of argumentation let us assume that QR is the relevant operation. Note that the two sentences in (6) have the same interpretation, as expected if, in both, the quantified phrase raises to a position outside VP:

(7) [everyone he could [e]]$_k$ [John [$_{VP}$ gave a box of girl-scout cookies to t_k]]

From this position it possible to reconstruct the VP *give a box of girl-scout cookies to t* into the empty position within the quantified phrase, giving the intended interpretation:

(8) [everyone he could [give a box of girl-scout cookies to t_k]]$_k$ [John [$_{VP}$ gave a box of girl-scout cookies to t_k]]

Since the apparent rightward movement in (6b) has no effect on interpretation, we must assume that the phrase *a box of girl-scout cookies* in (6b) is still contained inside the VP even in its right-peripheral position, since it must be available to the reconstruction operation that yields (8) from (7). This accords with Kayne's assumptions, under which the LCA implies that the constituent farthest to the right is also the most deeply embedded. Thus, for Kayne, (6b) is an instance of leftward movement of the phrase *to everyone he could* over *a box of girl-scout cookies*.

The situation in (6) contrasts sharply with the one in (9), with an argument and adjunct instead of two arguments:

(9) a. John saw every movie Mary did [e] twice.
b. John saw twice every movie Mary did [e].

Sentence (9b), with Heavy NP Shift, has the interpretation that both John and Mary saw each movie twice, so the verbal adjunct *twice* must be within the scope of the VP copy operation which gives the null VP its interpretation, i.e. the interpretation is as in (10):

(10) [every movie Mary [saw t twice]] [John [saw t twice]]

In (9a), however, that reading is crucially not available, which means that the adjunct must not be copied into the null VP. Therefore, the target of the reconstruction operation in (9a) must be the string which includes the verb and the trace of the NP complement but excludes the adjunct *twice*, so that the interpretation is as in (11) (with *twice* an adjunct of the matrix verb):

(11) [every movie Mary [saw t]]$_k$ [John saw t_k twice]]

I will show that it is not possible to identify that string as the target of reconstruction given the assumptions of Kayne (1994). Instead, it must be the case that the verbal adjunct is right-adjoined.

First, let us examine the syntactic conditions on VP ellipsis reconstruction involving adjuncts more closely. In particular, consider the following two conditions:

(12) Conditions on VP ellipsis reconstruction
I. the target of reconstruction is a constituent.
II. reconstruction is maximal

We might assume that reconstruction simply targets a substring of the terminal string of the antecedent clause, so that targeting the string *saw t* of the larger string *saw t twice* is unproblematic. However, this is ruled out by condition I--VP ellipsis reconstruction targets constituents. We can see that this is the case from two facts. First, discontinuous strings cannot be the target of ellipsis:

(13) *John hit Fred on the head with a crowbar, and Bill did [e] on the shoulder [e]

In (13) the discontinuous string *hit Fred . . .with a crowbar* is the target of reconstruction, and the result is distinctly odd. Second, a continuous string which does not match constituent boundaries cannot be the target:

(14) *John hit Fred on the head and Bill did [e] the shoulder

Both of these facts fall out under the assumption that the operation which reconstructs null VPs does not operate on terminal strings but on phrase markers, i.e. it targets a single node of the tree structure.

Condition II is meant to describe the fact that given a typical VP ellipsis context, the target of the reconstruction of the null VP is maximal, in that the null VP is interpreted as containing as many of the verbal adjuncts of its antecedent as possible. Thus (15a) must have the interpretation in (15b):

(15) a. John hit Fred on the head with a crowbar, and Bill did [e] too
b. John hit Fred on the head with a crowbar, and Bill hit Fred on the head with a crowbar.

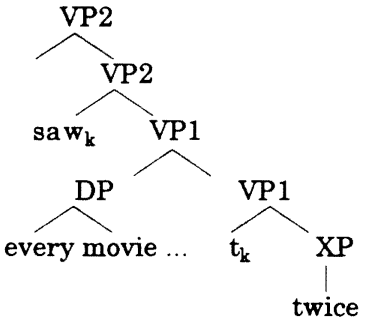
It is possible for adjuncts to be contrasted from the antecedent to the null VP, but the contrasted element(s) must be at the right periphery, and again the reconstruction must be maximal up to the contrast:

(16) a. John hit Fred on the head with a crowbar, and Bill did [e] with a lead pipe.
b. John hit Fred on the head with a crowbar, and Bill did [e] on the shoulder with a lead pipe.

In this respect (9a) is distinctly odd in that even though the adjunct *twice* is not explicitly contrasted between the null VP and its antecedent, that adjunct is nevertheless missing from the reconstruction in (11). We thus hope to accomplish two things: first, we would like to identify the constituent that is targeted in the reconstruction operation that yields (11); and second, we would like to have an explanation for why the reconstruction is not maximal.

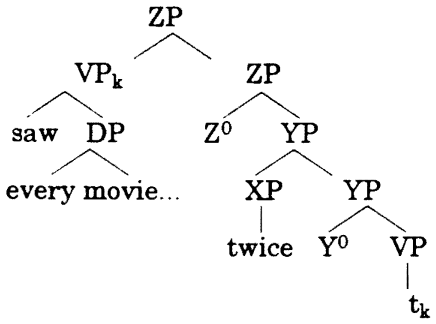
Let us begin by considering the possible structures of the verb phrase *saw every movie Mary did twice* in an LCA-based theory. The adjunct *twice*, appearing as it does on the right periphery, must be the most deeply embedded constituent. Let us assume then a Larsonian shell analysis, so that the structure is as in (17):

(17)



While this structure accords with the LCA, it cannot possibly be the right structure for (9a), because there is no VP constituent here which can serve as the antecedent for the null VP, i.e., a VP which includes the verb and its argument but excludes the adjunct. Suppose then that (9a) results from leftward movement of the VP *saw every movie Mary did* over the adjunct *twice*. If the adjunct is originally projected into the structure to the left of VP, it can only occupy a specifier (=adjunct) position in the LCA theory. And since only one specifier position is allowed per phrase by Kayne (1994), the movement of the VP could only be to a higher specifier/adjunct position, meaning we must assume the presence of an additional functional projection:

(18)



This structure is both consistent with the LCA and contains the constituent we need, namely VP_k. The problem here (apart from the questionable nature of the ZP constituent) is that the movement required to get VP_k to the left of the adjunct is wholly unmotivated by independent means, and is thus impossible given the now widely-adopted assumption that movement is driven by the need to satisfy morphological requirements (or to check features; see Chomsky 1993, 1995). If we assume some notion of economy of derivation (Chomsky 1991) then we would like to rule out derivations which contain superfluous steps. There is no property of VP_k which is satisfied by virtue of its moving to the specifier of ZP, hence that movement is unnecessary, and hence in violation of economy of derivation.

In fact there is no representation which we can assign to (9a) which both accords with the LCA and gives us the correct interpretation but does not contain superfluous movement operations. We are thus led to abandon one of our assumptions. I would like to suggest that the LCA in its strongest form should not be maintained, and that adjunction on the right be maintained as an allowable option. Thus the structure of (9a) would be as in more traditional analyses:

(19) John [[saw every movie Mary did [e] $_{VP1}$] twice $_{VP2}$]

Given the structure in (19), the interpretation of the sentence is straightforward. After QR, the reconstruction operation targets VP1, and not VP2:

(20) [every movie Mary [saw t]]$_k$ [John [[saw t_k $_{VP1}$] twice $_{VP2}$]]

If this analysis is correct, then a possible solution to the second of our problems above suggests itself. We wanted to explain why the reconstruction is not maximal, i.e. why it excludes the adjunct *twice*, when in typical VP ellipsis contexts all the adjuncts of the antecedent must be included in the reconstruction. The structure (19) for (9a) differs from the more typical VP ellipsis constructions, e.g. (15) and (16), in one crucial respect: in (19), the adjunct c-commands the ellipsis site. I would suggest then that VP ellipsis reconstruction obeys the following condition in addition to those in (12):

(21) III. No constituent which c-commands the null VP can be included in the reconstruction.

The same argumentation holds more generally for other cases of VP ellipsis involving adjuncts. Let us note another asymmetry between arguments and adjuncts in the context of VP ellipsis: adjuncts may be contrasted between the antecedent clause and the ellipsis clause, as shown above, but arguments may not:

(22) a. John hit Fred on the head with a crowbar, and Bill did [e] with a lead pipe.
b. *John gave a box of girl scout cookies to Mary, and Bill did [e] to Fred.

Thus only some of the content of the antecedent VP is reconstructed into the null VP in (22a), namely, the sub-constituent *hit Fred on the head*. Under more traditional assumptions about the position of adjuncts, we would simply say that the reconstruction operation targets VP2 and not VP3 in the antecedent:

(23) . . . [[[hit Fred $_{VP1}$] on the head $_{VP2}$] with a crowbar $_{VP3}$]

In an LCA-based theory, however, (23) is an impossible structure, for the adjuncts on the right asymmetrically c-command the material within VP1, but do not precede that material. However, there is as above no structure we can assign that yields the correct interpretation, conforms to the LCA, and contains no superfluous movements.

The asymmetry between (22a) and (22b) suggest that the mechanism of VP ellipsis treats arguments differently from adjuncts. Given the former segment/category distinction this fact falls out if we assume that VP reconstruction can target any segment of its antecedent category. If arguments are always dominated by all segments of a category, but adjuncts are not, then we naturally conclude that arguments can never be contrasted (as they will always be within the scope of the reconstruction) while adjuncts may be contrasted. This accords with the facts in (22). But if conclusion (ii) from section 1.0, i.e. Kayne's (1994) conclusion that there is no structural distinction between specifiers and adjuncts, is true, then we have no account of why sentences like (22b) are out. The fact that (22b) is ill-formed indicates that the null VP reconstruction operation is sensitive to the distinction between arguments and adjuncts, i.e. between segments and categories as construed by May (1985), Chomsky (1986), etc.

4.0 MAINTAINING THE LCA?

If the two empirical conclusions discussed in the introduction are inadequate, then what is the status of the LCA? Kayne's (1994) proposal has two general motivations: (a) to derive linear order of terminal elements from asymmetric c-command relations, and (b) to eliminate the need to postulate a primitive X-bar schema by deriving its effects independently. Part (b) is accomplished strictly by means of the antisymmetry requirement on phrase markers. Part (a), however, requires an independent stipulation: that asymmetric c-command corresponds to linear precedence. Nothing forces such a correspondence however, so it is entirely possible to take the antisymmetry requirement to hold in such a way that it does not in any way determine linear order. Thus the mirror image of the tree in (4), for example, could also be an admissible phrase marker, so long as c-command is divorced from linear precedence. This much was noted by Chomsky (1994, note 32), although Chomsky still takes c-command to correspond to precedence. However, the arguments presented above suggest that it is not possible to assume that right peripheral constituents cannot

c-command items to their left, and if that is the case, then the relationship between c-command and precedence cannot be maintained. This has no bearing on (b), however. Kayne's argument that X-bar theory may be dismissed goes through. We can take the antisymmetry requirement on phrase markers to be a part of UG. However, it seems ordering relations cannot be derived directly from this requirement.

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