

## INCOMPLETE VP DELETION AND GAPPING

K.A. JAYASEELAN

Central Institute of English and Foreign Languages  
Hyderabad, India

### 1. INCOMPLETE VP DELETION

VP Deletion is generally formulated as a rule which deletes a VP under identity with a preceding VP. But, as has been known for some time (Quirk *et al* [14], Halliday and Hasan [7], Sag [20]), this rule sometimes seems to delete less than the whole VP. This is illustrated in (1) (from Sag [20:34,57], who quotes the last two examples from Halliday and Hasan [7:49]). (The  $\emptyset$  indicates the positions in which lexical material appears to be deleted; the material which appears to be deleted in each such position is indicated in parenthesis.)

- (1) a. Mary hasn't dated Bill, but she has  $\emptyset$  Harry. ( $\emptyset$  = dated)  
 b. It doesn't bother Harry that Bill left, but it does  $\emptyset_1$  me  $\emptyset_2$ . ( $\emptyset_1$  = bother;  $\emptyset_2$  = that Bill left)  
 c. Speaker A: Gee, I've never seen you on campus before.  
 Speaker B: Yeah! Neither have I  $\emptyset_1$  you  $\emptyset_2$ . ( $\emptyset_1$  = seen;  $\emptyset_2$  = on campus before)  
 d. Speaker A: Is she suing the hospital?  
 Speaker B: She is  $\emptyset$  the doctor. ( $\emptyset$  = suing)  
 e. Speaker A: Has he sold his collection yet?  
 Speaker B: He has  $\emptyset$  some of the paintings; I'm not sure about the rest. ( $\emptyset$  = sold)

Although in all the examples of (1) the "remnants" of VP are direct objects, this is not necessarily the case, as in (2):

- (2) a. You can't count on a stranger, but you can  $\emptyset$  on a friend. ( $\emptyset$  = count)  
 b. This wasn't noticed by the police, but it was  $\emptyset$  by a neighbor. ( $\emptyset$  = noticed)

Stating a deletion rule which leaves a "remnant" (sometimes in the "middle" of the deleted constituent, cf. (1b) and (1c)) remains a problem, to the best of

our knowledge.

Notice that the "remnants" of our examples invariably receive contrastive stress (focus). Without such stress the sentences are impossible, as in (1d') which is a variant of (1d):

- (1) d'. Speaker A: Is she suing the hospital?  
 Speaker B: \*Yes, she is  $\emptyset$  it.

Let us assume that the stress makes the constituents "heavy" in some sense, making them capable of undergoing an extraposition process. The extraposed constituents can be adjoined to the VP; thus, (1a) will have the structure (3) prior to deletion:

- (3) Mary hasn't [<sub>VP</sub> dated t<sub>i</sub>] Bill<sub>i</sub> ], but she has [<sub>VP</sub> [<sub>VP</sub> dated t<sub>j</sub>] Harry<sub>j</sub>]

If we can ignore the non-identity of indices on the traces, the inner VP's of the two conjuncts are identical and deletion can go through. (We shall take up presently the problem of the non-identical indices on the traces.)

Heavy NP Shift – also called "Focus NP Shift" (Rochemont [17]) – is a process which right-adjoins an NP to VP for the purpose of focussing it, as in (4):

- (4) a. They [<sub>VP</sub> brought [<sub>NP</sub> the man who was being interrogated ] into the room]  
 b. They [<sub>VP</sub> [<sub>VP</sub> brought t<sub>i</sub> into the room] [<sub>NP</sub> the man who was being interrogated] ]

Stowell [21:160] has generalized this rule with the rule which adjoins a VP-internal tensed S' complement to the VP, as in (5):

- (5) a. They [<sub>VP</sub> said [<sub>S</sub> that they were leaving ] to me]  
 b. They [<sub>VP</sub> [<sub>VP</sub> said t<sub>i</sub> to me] [<sub>S</sub> that they were leaving]]

Kayne [10] has suggested that the process which transports an NP across a particle, as in (6), is the same process as Heavy NP Shift ( $\alpha$  in (6) is a 'small clause').

- (6) a. John [<sub>VP</sub> looked [ <sub>$\alpha$</sub>  [<sub>NP</sub> the information ] up ]]  
 b. John [<sub>VP</sub> [<sub>VP</sub> looked [ <sub>$\alpha$</sub>  t<sub>i</sub> up ] ] [<sub>NP</sub> the information ]]

We wish to claim that the extraposition process illustrated in (3) is also an instance of this rule.

We shall use three diagnostics to establish this claim. Firstly, note that when Heavy NP Shift applies to the object of a preposition, it obligatorily pied-pipes the preposition, as in (7b) and (7c); this is so even in cases where *wh*-movement and NP Movement can strand a preposition, as in (7d) and (7e):

- (7) a. John counted [<sub>pp</sub> on a total stranger] for support.  
 b. John counted for support on a total stranger.  
 c. \*John counted on for support a total stranger.  
 d. Who did John count on for support?  
 e. A total stranger was counted on for support.

This fact, discussed by Riemsdijk [15:146] and Stowell [21:452ff.], makes the following prediction for our analysis: in incomplete deletion of VPs, the object of a preposition can never be the remnant; only the whole PP can be. This prediction is borne out, as in (8):

- (8) a. You can't count [<sub>pp</sub> on a stranger]; but you can count [<sub>pp</sub> on a friend]  
 b. You can't count on a stranger; but you can on a friend. (= (2a))  
 c. \*You can't count on a stranger; but you can a friend.

A second fact discussed by Stowell [21:161, 216ff.] is that the adjunction rule (perhaps owing to a processing difficulty) may felicitously adjoin only one constituent to the VP; we shall call this the "Double Adjunction Constraint". Thus, most speakers (but not all) would assign a \* to (9), in which both the direct object and a VP-internal S' have been extraposed (Stowell's example):

- (9) \*It proved to the jury his guilt that John was seen with the murder weapon. (vs. It proved his guilt to the jury that John was seen with the murder weapon.)

The prediction of this fact for us is that incomplete deletion of VPs may leave only one remnant. This is correct, as in:

- (10) \*I didn't give a dime to Mary, but I did a nickel to Jane.

(Again, not all speakers may agree on the \*, but this confirms our claim.)

Our third diagnostic is the Focus (or Heaviness) Constraint on the extraposed constituent. We have already shown that the remnant of incomplete deletion obeys this constraint.

Assuming, henceforth, that the adjunction rule required for the incomplete deletion of VPs is just Heavy NP Shift, we now turn to the question: is the trace generated by this rule a variable or an anaphor? The antecedent is in the  $\bar{A}$ -position, a fact which is consistent with the trace being a variable. On the other hand, the antecedent is not an operator. If a variable is defined as an  $\bar{A}$ -position trace bound by an operator (Borer [2]), the trace of Heavy NP Shift cannot be a variable.

We wish to argue that the trace in question is, in fact, subject to the opacity effects of tense and intervening subject, i.e., Principle A of the Binding Theory (Chomsky [4]), and is therefore an anaphor (cf. Pesetsky [13:232] where this claim is anticipated). Consider (11b), (12b) and (13b) derived, respectively, from (11a), (12a) and (13a) by deletion:

- (11) a. I didn't [<sub>vp</sub> expect [<sub>s</sub> your mother to like the picture]]; but I did [<sub>vp</sub> expect [<sub>s</sub> you to like the picture]]  
 b. I didn't expect your mother to like the picture; but I did you.  
 (12) a. I didn't [<sub>vp</sub> expect [<sub>s</sub> (that) [<sub>s</sub> your mother would like the picture]]]; but I did [<sub>vp</sub> expect [<sub>s</sub> (that) [<sub>s</sub> you would like the picture]]]  
 b. \*I didn't expect that your mother would like the picture, but I did you.  
 (13) a. I didn't [<sub>vp</sub> expect [<sub>s</sub> your mother to like the picture]], but I did [<sub>vp</sub> expect [<sub>s</sub> your mother to like the dinner]]  
 b. \*I didn't expect your mother to like the picture, but I did the dinner.

The sentences of (11) are instances of "Exceptional Case-Marking" (Chomsky [4]). Under standard assumptions of GB, the matrix verb governs the embedded subject in (11a). Therefore, the trace left by an adjunction of this NP to the matrix VP will have the matrix S as its governing category.<sup>1</sup> In (12a), the embedded subject is governed from within the embedded S (by AGR); therefore, the trace of the adjunction of this NP will have the

<sup>1</sup> The governing category of an anaphor (or pronoun) is defined in Chomsky [4] as the minimal category containing the anaphor (or pronoun), its governor, and an "accessible" SUBJECT. A SUBJECT is "accessible" to the anaphor (or pronoun), if the coindexing of it and the SUBJECT will not result in the following configuration.

[ $\alpha$ , ...  $\beta$ , ...]

In a tensed S, the SUBJECT is AGR; in infinitives, it is [NP, S]. In Chomsky [6], a slightly different definition is presented, but the original definition – or, indeed, the "Tensed-S Condition" and the "Specified Subject Condition" of Chomsky [3] – will do for our purposes.

embedded S as its governing category. In (13a), the result of adjoining *the dinner* to the matrix VP will be a trace whose governor is the embedded verb, and whose governing category, therefore, is the embedded S. The antecedent of the trace in all three cases will, of course, be in the matrix S. If we assume that the trace in question is an anaphor, the distribution of \*s is immediately explained by Principle A of the Binding Theory (Chomsky [4]):

(14) *Principle A of the Binding Theory*

An anaphor must be bound in its governing category.

In this connection, the following example of Heavy NP Shift cited by Stowell [21:234] is interesting:

(15) I expect  $t_i$  to have arrived [<sub>NP<sub>i</sub></sub> my good friend John]

The subject of a tensed embedded S cannot be moved by Heavy NP Shift, as in (16):

(16) \*I expect (that)  $t_i$  will have arrived [<sub>NP<sub>i</sub></sub> my good friend John]

Note that the parallelism between (11b)-(12b) and (15)-(16) supports our claim that Incomplete VP Deletion also involves the application of Heavy NP Shift.

Our conclusion (contra Stowell [21:137, 160], but in agreement with Pesetsky [13]) that the trace of adjunction to VP is an anaphor, carries the bonus that it explains why deletion is possible in (3) (repeated below):

(3) Mary hasn't [<sub>VP</sub> dated  $t_i$ ] Bill<sub>j</sub>, but she has [<sub>VP</sub> dated<sub>j</sub>] Harry<sub>j</sub>

Recall our problem that the trace in the *delendum* (the smaller VP of the second conjunct) has a different index than the trace in the "trigger" of deletion (the preceding smaller VP). However, it is typical of anaphors that non-identical indices on them do not matter for deletion, as in (17) and (18). In (17) we have an instance of "deletion-under-sloppy-identity," first studied by Ross [18].

(17) a. John<sub>i</sub> [<sub>VP</sub> loves himself<sub>j</sub>]; and Bill<sub>j</sub> [<sub>VP</sub> loves himself<sub>j</sub>], too.  
b. John loves himself; and Bill does, too.

(18) a. John<sub>i</sub> was [<sub>VP</sub> killed  $t_i$ ]; and Bill<sub>j</sub> was [<sub>VP</sub> killed  $t_j$ ], too.  
b. John was killed; and Bill was, too.

Anaphors contrast with variables in this respect, since it has been shown at some length (by Sag [20] and Williams [23]) that non-identical indices on variables block VP Deletion,<sup>2</sup> as in (19):

(19) a. \*Who does John like, and who does Mary?  
b. ... the man who John likes and (\*who) Mary doesn't ...

Example (19a) has the structure (20) as the input to deletion:

(20) [<sub>S</sub> who<sub>i</sub> does John [<sub>VP</sub> like  $t_i$  ]], and [<sub>S</sub> who<sub>j</sub> does Mary [<sub>VP</sub> like  $t_j$  ]]

The non-identical indices on the traces block deletion.

Should it have been possible to first extrapose the *wh*-phrase to yield the structure (21), then apply *wh*-movement to yield (22), and subsequently apply deletion?

(21) [<sub>S</sub> [<sub>S</sub> John [<sub>VP</sub> likes  $t_i$  ] who<sub>i</sub> ]]], and [<sub>S</sub> [<sub>S</sub> Mary [<sub>VP</sub> likes  $t_j$  ] who<sub>j</sub> ]]]

(22) [<sub>S</sub> who<sub>i</sub> [<sub>S</sub> John [<sub>VP</sub> likes  $t_i$  ]  $t'_i$  ]]], and [<sub>S</sub> who<sub>j</sub> [<sub>S</sub> Mary [<sub>VP</sub> likes  $t_j$  ]  $t'_j$  ]]]

Deletion should now go through, since the traces in the smaller VPs are anaphors. However, this derivation is blocked by the requirement that variables should occupy A-positions.<sup>3</sup>

With the parenthesized *who* in, (19b) is ungrammatical for the same reason as (19a). Without that *who*, the sentence must be taken to be generated by

<sup>2</sup> Strictly speaking, non-identical indices on variables bound from outside the "trigger" and the "target" of deletion block deletion. Note also that this is the case in (19). If the antecedents are included in the "trigger" and the "target," as in (ia), the indices can be treated as alphabetic variants (Sag [20]), and the deletion goes through, as in (ib):

(i) a. John doesn't [<sub>VP</sub> know [<sub>S</sub> what<sub>i</sub> I like  $t_i$ ]], but Mary does [<sub>VP</sub> know [<sub>S</sub> what<sub>j</sub> I like  $t_j$ ]]

b. John doesn't know what I like, but Mary does.

<sup>3</sup> Cf. also data like (i), (pointed out to us by Richard Kayne):

(i) Where did you go?

\* I did to the hospital.

If *where* is moved directly into the COMP from its D-structure position, it leaves a variable in that position. In the corresponding position in the *delendum*, there is an anaphoric trace, since *to the hospital* is Heavy-NP-Shift-ed. Now deletion is blocked by non-identity. If *where* is first extraposed before being moved into the COMP, we have the problem just noted in the text.

across-the-board *wh*-movement (Williams [24]); in this case, one *who* binds both traces so that the traces have identical indices.

Returning to (3), let us emphasize that the permissibility of deletion in such structures, and its impermissibility in structures like (20), is strong evidence that the trace of Heavy NP Shift is an anaphor.<sup>4</sup>

The combined predictions of the Binding Theory and the Empty Category Principle (ECP)<sup>5</sup> define the set of positions in which constituents may be remnants (now, more precisely, the positions from which constituents may be Heavy-NP-Shift-ed). We have seen the operation of Principle A in (11) - (13) and (15) - (16). Note that (12b) and (16) are also ruled out by the ECP; the adjunction (to the matrix VP) of the subject of the embedded tensed clause leaves a trace which is not lexically governed, under the assumption that a matrix verb cannot govern across two S-type nodes (Chomsky [4]). It is also not antecedent-governed, if the antecedent (similarly) cannot govern across two S-type nodes. Alternatively, in the "Barriers" framework (Chom-

<sup>4</sup> For an argument that the trace of "Extrapolation-from-NP" is an anaphor, cf. Chomsky [4:219]. This further supports our claim.

Before proceeding, we must note some untidy facts. Consider the following sentence, which seems acceptable:

- (i) I didn't expect to like your mother, but I did you.

One can construct other such sentences with even more *to*-V sequences intervening between the matrix verb and the remnant, which also seem to be acceptable:

- (ii) a. He hasn't tried to begin to write a novel, but he has a play.  
b. He isn't going to try to begin to write a novel, but he is a play.

The underlying structure of (iib), for example, is (iii):

- (iii) He isn't [<sub>VP</sub> going [<sub>S</sub> [<sub>S</sub> PRO to try [<sub>S</sub> [<sub>S</sub> PRO to begin [<sub>S</sub> [<sub>S</sub> PRO to write a novel ]]]]]], but he is [<sub>VP</sub> going [<sub>S</sub> [<sub>S</sub> PRO to try [<sub>S</sub> [<sub>S</sub> PRO to begin [<sub>S</sub> [<sub>S</sub> PRO to write a play ]]]]]]

Adjunction of a *novella* play to the matrix VP leaves a trace which ought to violate Principle A of the Binding Theory, but apparently doesn't. We can only suggest that there is a restructuring process at work here, which deletes the intervening PROs. Note that an intervening lexical NP blocks the restructuring:

- (iv) a. He doesn't expect to cook today, but he expects to cook tomorrow.  
b. He doesn't expect to cook today, but he does tomorrow.  
(v) a. He doesn't expect Mary to cook today, but he expects Mary to cook tomorrow.

- b.\* He doesn't expect Mary to cook today, but he does tomorrow.

Richard Kayne (personal communication) finds (13b) with 'anybody' in place of 'your mother' "somewhat less bad":

- (vi) I didn't expect anybody to like the picture, but I did the dinner.

If this judgment is correct, the fact that the intervening embedded subject is a variable, instead of a "full name," makes a slight difference, for reasons which are totally unclear to us.

<sup>5</sup> The Empty Category Principle (Chomsky [4]), stipulates that an empty category (other than PRO) must be "properly governed." A category A is properly governed if it is governed either by a category coindexed with A (antecedent government), or by a lexical category V, N, or A (lexical government). AGR is not a proper governor. P is a proper governor only if it has been reanalyzed with a V.

sky [5]), the embedded S'-node is a "barrier-by-inheritance" for the trace in the embedded subject position, and it blocks the government of the trace by either the matrix verb or the antecedent.

Now consider the possibility of elements in the embedded COMP being remnants:

- (23) a. He hasn't [<sub>VP</sub> decided [<sub>S</sub> which boys<sub>i</sub> [<sub>S</sub> PRO to abduct t<sub>i</sub> ]]], but he has [<sub>VP</sub> decided [<sub>S</sub> which girls<sub>j</sub> [<sub>S</sub> PRO to abduct t<sub>j</sub> ]]]  
b. He hasn't decided which boys to abduct, but he has which girls.<sup>6</sup>
- (24) a. He hasn't [<sub>VP</sub> raised the question of [<sub>S</sub> which boys<sub>i</sub> [<sub>S</sub> PRO to abduct t<sub>i</sub> ]]], but he has [<sub>VP</sub> raised the question of [<sub>S</sub> which girls<sub>j</sub> [<sub>S</sub> PRO to abduct t<sub>j</sub> ]]]  
b. \*He hasn't raised the question of which boys to abduct, but he has which girls.

In (23a), the embedded COMP is governed by the matrix verb across a single S-type boundary; therefore, the adjunction of *which boys/which girls* leaves a trace which is lexically governed. It is also antecedent-governed, under the assumption that the intervening S'-node, being L-marked, is not a barrier (Chomsky [5]). In (24a), the corresponding trace is not antecedent-governed or lexically governed, under the natural assumption that the intervening S'-node is not L-marked (either by the matrix V, or by the preposition *of*), and so acts as a barrier.<sup>7</sup>

We conclude this section by noting a wrinkle in our account, and by suggesting a solution to it. Our account assumed that the adjunction of both the remnant and its 'counterpart' in the preceding VP (the element it is contrasted with) takes place in the syntax. This, however, cannot be true of the 'counterpart.' Consider (1c) which is repeated below:

<sup>6</sup> Example (23b) is not a case of Sluicing (Ross [19]), as might be suspected. The output of sluicing would be the following:

\*He hasn't decided which boys to abduct, but he has decided which girls.

<sup>7</sup> Interestingly, an element in an embedded COMP cannot be a remnant of Incomplete VP Deletion if the embedded clause is tensed. Thus, (ib) (below) contrasts with (23b) as regards grammaticality:

- (i) a. He hasn't [<sub>VP</sub> decided [<sub>S</sub> which boys<sub>i</sub> [<sub>S</sub> he should abduct t<sub>i</sub> ]]], but he has [<sub>VP</sub> decided [<sub>S</sub> which girls<sub>j</sub> [<sub>S</sub> he should abduct t<sub>j</sub> ]]]  
b.\* He hasn't decided which boys he should abduct, but he has which girls.

The opacity induced by a tense seems to extend to the COMP-position of a tensed clause, a fact which can be explained by the claim that the head of COMP is Tense (Stowell [21] [22]).

- (1) c. Speaker A: Gee! I've never seen you on campus before.  
Speaker B: Yeah! Neither have I you.

The underlying structure of the sentences of this exchange is (25a); adjunction of both the remnant-to-be and its 'counterpart' should give us (25b):

- (25) a. Speaker A: ... I have never [<sub>VP</sub> seen you on campus before]  
Speaker B: ... Neither have I [<sub>VP</sub> seen you on campus before]  
b. Speaker A: ... I have never [<sub>VP</sub> [<sub>VP</sub> seen t<sub>i</sub> on campus before ] you<sub>i</sub> ]  
Speaker B: ... Neither have I [<sub>VP</sub> [<sub>VP</sub> seen t<sub>j</sub> on campus before ] you<sub>j</sub> ]

Deletion would now give us (26), in which Speaker A's sentence is acceptable (if at all) only with heavy stress on *you*; but, in any case, it is not the sentence we wished to generate.

- (26) Speaker A: ??Gee, I've never seen on campus before you.  
Speaker B: Yeah! Neither have I you.

In the case of (1b) which is repeated below, notice that the adjunction of *Harry* to the VP would also fall afoul of the "Double Adjunction Constraint" since a tensed S' complement in the VP is obligatorily extraposed (Stowell [21:160]).

- (1) b. It doesn't bother Harry that Bill left; but it does me.

In this connection, note that in our examples only the remnant receives contrastive stress invariably. Its 'counterpart' in the "trigger" VP may or may not be stressed, i.e., may or may not be a focus constituent. Thus, in (1c), the *you* of Speaker A's utterance is not normally stressed. Example (1d) is repeated below:

- (1) d. Speaker A: Is she suing the hospital?  
Speaker B: She is the doctor.

Here, *the hospital* is not normally stressed.

Let us say, then, that the adjunction in the "trigger" VP does not take place in the syntax, but in the LF-component. The adjunction in the "target" VP takes place in the syntax. There is no problem for deletion-under-identity however if, as Sag argues [20:chpt 2], identity of "target" and "trigger" is 'checked' at LF.

The "heaviness (or focus) constraint" on adjunction to VP is probably a factor peripheral to grammar (cf. Ross [18], Stowell [21:217] for a similar point of view). If we abstract away from it, adjunction is an option available to any constituent, in any component of the grammar. The transporting of a constituent over a relatively more "heavy" constituent is a problem only if these appear in that order in the surface string. Similarly, "double adjunction" is a problem apparently only in the syntax, and not at LF (cf. "doubly-filled" COMP at LF). If our analysis is correct, the LF representation of (1b) is (1b'):

- (1) b'. It doesn't [<sub>VP</sub> [<sub>VP</sub> bother t<sub>i</sub> t<sub>j</sub>] [<sub>S<sub>J</sub></sub> that Bill left ]] [<sub>N<sub>PI</sub></sub> Harry]]; but it does [<sub>VP</sub> [<sub>VP</sub> bother t<sub>k</sub> t<sub>l</sub>] [<sub>S<sub>I</sub></sub> that Bill left ]] [<sub>N<sub>PK</sub></sub> me]]

This instances both the transportation of a constituent over a more "heavy" constituent, and "double adjunction."

## 2. GAPPING

From the point of view of our analysis of incomplete deletions, Gapping can be analyzed as S Deletion with two remnants. Single-remnant deletions of S are also possible, and are illustrated in (27) and (28). Gapping is illustrated in (29), in which the (b) sentence is derived by deletion from the (a) sentence:

- (27) a. John loves Mary, and Bill loves Mary (too).  
b. John loves Mary, and Bill (too).  
(28) a. John loves Mary, and John loves Jane (too).  
b. John loves Mary, and Jane (too).  
(29) a. John loves Mary, and Bill loves Jane.  
b. John loves Mary, and Bill Jane.

Let us say that the constituent from the VP is right-adjoined to S. and the subject is left-adjoined to S. Although it is generally assumed that the choice between left-adjunction and right-adjunction is free, there is probably a principle like (30) operative here:

- (30) The direction of adjunction (by Heavy NP Shift) mimics the direction of government.<sup>8</sup>

Since the subject is governed leftward (by INFL), and the constituent of VP is governed rightward (by V), their preferred direction of adjunction is leftward and rightward respectively. Under this analysis, (29b) will have (31) as the underlying structure which is the input to deletion:

- (31) [<sub>S</sub> John<sub>i</sub> [<sub>S</sub> [<sub>S</sub> t<sub>i</sub> loves t<sub>j</sub> ] Mary<sub>j</sub> ]], and [<sub>S</sub> Bill<sub>k</sub> [<sub>S</sub> [<sub>S</sub> t<sub>k</sub> loves t<sub>l</sub> ] Jane<sub>l</sub> ]]

The innermost S of the second conjunct is deleted under identity with the innermost S of the first conjunct.

Gapping shows the diagnostic properties of Heavy NP Shift. Thus, the object of a preposition cannot be a remnant, only the whole PP can be:

- (32) a. John depends on his wife, and Bill depends on his secretary.  
 b. \*John depends on his wife, and Bill his secretary.  
 c. John depends on his wife, and Bill on his secretary.

Only one constituent from the VP can be a remnant:

- (33) \*John gave a dime to Mary, and Bill a nickel to Jane.

(Exactly as in the case of the parallel example with Incomplete VP Deletion, not all speakers will agree on the \*.) The remnants of Gapping must bear contrastive stress, as in (34):

- (34) a. \*John loves Mary, and Bill Mary.  
 b. \*John loves Mary, and John Jane.

The second remnant of Gapping can be the subject of an embedded infinitival, as in (35), but not the subject of an embedded tensed S, as in (36), nor a constituent of the embedded VP, as in (37).

<sup>8</sup> In SOV languages, in which the subject and the complement(s) of the verb are uniformly governed leftward, the normal (or preferred) direction of Scrambling is leftward. Rightward Scrambling is highly marked.

Incidentally, languages which have the rule of Scrambling seem to allow any number of remnants in Gapping, whereas Gapping in English can have only two remnants, a fact which we discuss below.

- (35) John expected Bill to leave, and Bill John.

- (36) \*John expected that Bill would leave, and Bill John.

- (37) \*John expected Bill to like Mary, and Peter Jane.

(≠John expected Bill to like Mary, and Peter expected Bill to like Jane.)

These data are accounted for by Principle A of the Binding Theory.<sup>9</sup>

The trace in the subject position of a gapped sentence is governed by its antecedent, as in (31). There are two S-nodes between *John<sub>i</sub>* and its trace but, since they are projections of the same INFL which projects the S-node containing *John<sub>i</sub>*, they are not barriers for the antecedent-government of the trace (Chomsky [5]). The trace in the VP of a gapped sentence is permissible if it is properly governed, otherwise not, as illustrated in examples (38) and (39):

- (38) a. John knows [<sub>S</sub> which boys [<sub>S</sub> PRO to abduct t]], and Bill knows [<sub>S</sub> which girls [<sub>S</sub> PRO to abduct t]]  
 b. John knows which boys to abduct, and Bill which girls.<sup>10</sup>

- (39) a. John raised the question of [<sub>S</sub> which boys [<sub>S</sub> PRO to abduct t]] and Bill raised the question of [<sub>S</sub> which girls [<sub>S</sub> PRO to abduct t]]  
 b. \*John raised the question of which boys to abduct, and Bill which girls.

Examples (38b) and (39b) are accounted for along the lines of our explanation of (23b) and (24b).

Gapping is one of the more well-studied rules of grammar, and the question of what makes a remnant of Gapping licit or illicit has received a good deal of attention. But many of the "constraints on Gapping" proposed

<sup>9</sup> As in the case of Incomplete VP Deletion (cf. footnote 4), we have data like (i) (from Sag [20:146], who credits the sentence to Ross), which are a problem for the Binding Theory unless we postulate a restructuring rule:

(i) John tried to begin to write a play, and Harry a novel.

Richard Kayne (personal communication) finds (ii) "fairly acceptable:"

(ii) His father made him study English, and his mother French.

Cf. the somewhat similar data involving a variable in the embedded subject position, also noted in footnote 4. These remain a problem.

<sup>10</sup> Cf. footnote 6. The output of Sluicing, in this case, would be:

\*John knows which boys to abduct, and Bill knows which girls.

in the literature now fall out naturally from our analysis. One such is the "two remnants constraint," mentioned by Sag [20:144]. The following are Sag's examples:

- (40) a. \*Alan gave Sandy a book, and Peter Betsy a magazine.  
 b. \*Arizona elected Goldwater Senator, and Massachusetts McCormack Congressman.

But if only one constituent can be felicitously adjoined to S in any direction (leftward or rightward), this constraint follows.<sup>11</sup> Hankamer's [9] "Major Constituent Constraint" (below) was designed to prevent the Gapping transformation from analyzing the object of a preposition, or a constituent of an embedded S.

- (41) *Hankamer's Major Constituent Constraint*  
 The remnants of Gapping are 'major constituents'; where a 'major constituent' of a given sentence  $S_0$  is a constituent either immediately dominated by  $S_0$ , or immediately dominated by VP which is immediately dominated by  $S_0$ .

This constraint is now superfluous, since we have shown that the ungrammatical data excluded by it can be handled by the ECP and the Binding Theory. This constraint is also incorrect, in view of data like (35), wherein the subject of an embedded infinitival is a remnant, and (38b), in which the remnant is a *wh*-phrase in the embedded COMP.

Hankamer [8:20] and Anneke Neijt [12] have claimed that Gapping obeys the Island Constraints. Neijt states that "a string that can be crossed by *wh*-movement is a string that can be gapped" [12:130].<sup>12</sup> Her evidence [12:136, 138]:

<sup>11</sup> An apparent counterexample is:

- (i) Yesterday John left, and today Bill.

Seemingly, both remnants must be left-adjoined, e.g., *Bill* must be left adjoined, by our principle (30). But it then follows that *today* also must be left-adjoined since it precedes *Bill*. But the prediction now is that a third constituent can be freely right-adjoined, giving us an instance of Gapping with three remnants. This is false, as in (ii):

- (ii) \*Yesterday John shot a tiger, and today Bill a bison.

A conclusion we can draw is that, under certain conditions as yet unclear, the subject NP may be allowed to be right-adjoined, which would relax (30).

<sup>12</sup> In Neijt's analysis, the remnants of Gapping are *in situ*. Apparently she generalizes Gapping with *wh*-movement in terms of the constraints on the variable strings analyzed by the two rules.

- (42) a. John discussed my question of which flowers they saw and Bill discussed my question of which animals they saw.  
 b. \*John discussed my question of which flowers they saw and Bill (of) which animals. (Complex NP Constraint)
- (43) a. John wondered what to cook today, and Peter wondered what to cook tomorrow.  
 b. \*John wondered what to cook today, and Peter tomorrow. (*wh*-Island Constraint)

Example (42b), with *which animals* as a remnant, is ruled out along the lines of (24b) by the ECP.<sup>13</sup> As for *of which animals*, this string cannot be a remnant because it is not a constituent. For (43b), see our discussion of (vb) of footnote 4.

It has been pointed out by Sag [20:145-6], that the gapping rule cannot delete a complementizer (examples from Sag):

- (44) a. Sandy said (that) he was a fool, and Betsy that he was out of his mind.  
 B. \*Sandy said (that) he was a fool, and Betsy he was out of his mind.
- (45) a. Sandy preferred for Alan to do it, and Betsy for Peter to do it.  
 b. \*Sandy preferred for Alan to do it, and Betsy Peter to do it.

Restated in our terms, the restriction is that an S cannot be Heavy-NP-Shifted, stranding a complementizer. This holds for Heavy NP Shift in general:

- (46) a. John used to maintain in those days that the earth is flat.  
 b. \*John used to maintain that in those days the earth is flat.
- (47) a. John used to prefer in those days for the earth to be considered flat.  
 b. \*John used to prefer for in those days the earth to be considered flat.

<sup>13</sup> The point is that since the ECP applies equally to *wh*-traces and empty anaphors, any data of Neijt's which can be accounted for in terms of the ECP cannot decide between her analysis and ours. This observation is relevant for her evidence that Gapping observes the Sentential Subject Constraint (Ross [18]), the Subject Constraint (Chomsky [3]), and the NP Constraint (Bach and Horn [1]).

These data are explained if complementizers are not proper governors. The matrix verb apparently cannot govern the trace of S, perhaps because of a "minimality condition" on government (Chomsky [5], Rizzi [16]).

Examples (44b) and (45b) could also be instances of the adjunction of an S' with an empty COMP. In this case, the sentences are ruled out by the requirement that an empty COMP must be properly governed (Stowell [21:396]).<sup>14</sup>

### 3. CONCLUSION: ELIMINATING "ELLIPSIS"

In this paper we have looked at types of data involving deletion of constituents which leaves remnants. We have sought to explain them in terms of a prior application of an extraposition rule (namely, Heavy NP Shift) and a subsequent application of deletion. Earlier approaches to these data which did not postulate the movement rule, and only examined the missing string, were faced with a very difficult problem when they tried to formally characterize the deletion. The rule seemed to affect a non-constituent string which could, moreover, be discontinuous.

The term "ellipsis" was used to refer to variable-deleting rules (Hankamer [8], [9]), as contrasted with constituent-deleting rules, e.g., Comparative Deletion. Gapping was the paradigm example of ellipsis. Gapping invariably deleted the entire Auxiliary and the main verb (which, together, did not form a constituent), and it could also take any number of elements in the VP which followed the second remnant, as in (48):

<sup>14</sup> There appears to be a "proximity constraint" on Incomplete VP Deletion and Gapping which requires the remnants to be 'close' – in the simple sense of length of intervening string – to their 'counterparts', as in the following examples of Incomplete VP Deletion:

(i) ? She isn't suing the hospital; but her lawyer says that she is the doctor. (Cf. She isn't suing the hospital; but her lawyer claims that she is.)

and Gapping:

(ii) \* John loves Mary, and Bill thinks Mary John.

We have no theory to advocate regarding this constraint except to suggest that it may have to do with a processing difficulty involved in relating remnants to positions within strings which are lexically empty. Example (ii) is worse than (i) perhaps because it has two remnants, instead of one, to relate to positions within lexically vacuous strings.

The processing difficulty mentioned may be at the basis of Kuno's [11] "Minimal Distance Principle" which says that in the interpretation of gapped sentences, the choice of 'counterparts' of the remnants falls "most readily" on the constituents of the preceding clause which were "processed last of all." This principle is designed to account for data like (iiib), in contrast with (iiia) and (iiic), first noticed by Hankamer [9]:

(iii) a. John likes to sing and Bill (likes) to dance.  
b. John likes Mary to sing and Bill \*(likes Mary) to dance.  
c. John likes Mary to sing and (John likes) Bill to dance.

- (48) John will eat apples at school on Tuesday, and Bill  $\emptyset_1$  bananas  $\emptyset_2$ .  
( $\emptyset_1$  = will eat;  $\emptyset_2$  = at school on Tuesday)

VP Deletion was generally considered a constituent-deleting rule, but only because the "incomplete deletion" data were mostly ignored. Sag, who noted them, left them as a problem and admitted the possibility that VP Deletion could be a rule of ellipsis [20:34].

No one, to our knowledge, has attempted a formulation of Incomplete VP Deletion, but there have been several attempts to formally state Gapping. One of the recent ones is Sag's, reproduced as (49):

- (49) Gapping (Sag [20:212])

$$W_3 - [{}_S X^2 - W_1 - [X^2]^* - W_2] - \left\{ \begin{array}{c} \text{and} \\ \text{or} \end{array} \right\} - [{}_S X^2 - W_1 - [X^2]^* - W_2] - W_4$$

1	2	3	4	5	6	7	8	9	10	11	⇒
1	2	3	4	5	6	7	∅	9	∅	11	

The X<sup>2</sup>s are maximal projections. Note that the rule of Gapping, according to this formulation, deletes two variables.

Gapping, as formulated by Sag or by others, overgenerates wildly, and the attempt has been to control the overgeneration by "constraints on deletion." These constraints, for the most part, cannot be assimilated to known principles which are operative in other parts of the grammar. They are, in other words, "special" constraints that apply to deletion rules. An exception is the claim made by Hankamer [8] and Neijt [12] that Gapping obeys the Island Constraints (cf. (42) and (43) above, and the discussion; cf. also footnote 12). But both Hankamer and Neijt take the Gapping remnants to be *in situ*; if the Island Constraints are constraints on movement rules (Chomsky [4]), their analysis is problematic.

The "separateness" of deletion rules from other components of the grammar is emphasized by their format. Current theories of linguistics have abandoned the *Aspects* format of transformations, in which transformations were stated in terms of factorized strings. In the Government and Binding Theory (Chomsky [4]), movement rules are reduced to the schema "Move  $\alpha$ ,  $\alpha$  a constituent." But the analogous rule for deletions, "Delete  $\alpha$ ,  $\alpha$  a constituent," cannot be adopted if deletions must affect non-constituent strings. Thus, deletion remains unintegrated with the other components of grammar.



In sum, if deletions are transformations, ellipsis is a problematic rule, since it is the only transformational operation which affects a non-constituent string.

The implication of this paper is that the above theoretical problems are artifacts of an inadequate analysis, and that Incomplete VP Deletion and Gapping delete constituents. The theoretical gain is that ellipsis can be eliminated from the theory of grammar.

### REFERENCES

1. Bach, E. and G.M. Horn. 1976. Remarks on 'Conditions on transformations'. *Linguistic Inquiry* 7:265-299.
2. Borer, H. 1982. On the definition of variables. *Journal of Linguistic Research* 1:3, 17-40.
3. Chomsky, N. 1973. Conditions on transformations. In *A Festschrift for Morris Halle* ed. by S. Anderson and P. Kiparsky. New York: Holt, Rinehart and Winston.
4. Chomsky, N. 1981. *Lectures on government and binding*. Dordrecht: Foris Publications.
5. Chomsky, N. 1986. *Barriers*. Cambridge, Mass: M.I.T. Press.
6. Chomsky, N. 1986. *Knowledge of language: its nature, origin, and use*. New York: Praeger.
7. Halliday, M.A.K. and R. Hasan. 1973. *Cohesion in spoken and written English*. London: Longmans.
8. Hankamer, J. 1971. *Constraints on deletion in syntax*. Yale University doctoral dissertation.
9. Hankamer, J. 1973. Unacceptable ambiguity. *Linguistic Inquiry* 4:17-68.
10. Kayne, R. 1985. Principles of particle constructions. In *Grammatical Representation* ed. by J. Guéron, H.-G. Obenauer and J.-Y. Pollock. Dordrecht: Foris Publications.
11. Kuno, S. 1976. Gapping: a functional analysis. *Linguistic Inquiry* 7:300-318.
12. Neijt, A. 1980. *Gapping: a contribution to sentence grammar*. Dordrecht: Foris Publications.
13. Pesetsky, D. 1985. Morphology and logical form. *Linguistic Inquiry* 16:193-246.
14. Quirk, R., S. Greenbaum, G. Leech and J. Svartnik. 1972. *A grammar of contemporary English*. London: Seminar Press.

15. Riemsdijk, H. van. 1978. *A case study in syntactic markedness*. Dordrecht: Foris Publications.
16. Rizzi, L. 1990. *Relativized minimality*. Cambridge, Mass: M.I.T. Press.
17. Rochemont, M. 1978. *A theory of stylistic rules in English*. University of Massachusetts doctoral dissertation.
18. Ross, J. 1967. *Constraints on variables in syntax*. M.I.T. doctoral dissertation.
19. Ross, J. 1969. Guess who? In *Papers from the Fifth Regional Meeting of the Chicago Linguistic Society* ed. by R. Binnick, A. Davison, G. Green and J. Morgan. Chicago: University of Chicago.
20. Sag, I. 1976. *Deletion and logical form*. M.I.T. doctoral dissertation, reprinted by Indiana University Linguistic Society.
21. Stowell, T. 1981. *Origins of phrase structure*. M.I.T. doctoral dissertation.
22. Stowell, T. 1982. The tense of infinitives. *Linguistic Inquiry* 13:561-570.
23. Williams, E. 1977. Discourse and logical form. *Linguistic Inquiry* 8:101-139.
24. Williams, E. 1978. Across the board rule application. *Linguistic Inquiry* 9:31-43.