

Chapter 7

Hans-Georg Obenauer
C.N.R.S.

Empty quantifiers, LF-Movement, and the ECP in French

0. I want to reconsider a claim I made earlier,¹ namely that

- (1) The empty quantifier in a NP of the form *e - de - personnes*, *e - de - papier* must be c-commanded by an actual quantifier like *beaucoup*, *combien*, *(ne) pas*,² in Logical Form (LF).

Kayne (1979b) has recently proposed, with his reformulation of Chomsky's (forthcoming) Empty Category Principle (ECP), a way of handling such facts, as well as a wide range of other phenomena. I intend to show that a c-command condition is not an automatic consequence of Kayne's formulation of the ECP, but that it is a necessary part of such a principle; it must thus explicitly be added to the present formulation. At the same time, in re-examining the way government of an empty element is obtained, I shall question the movement character of the LF rule applying to certain extraposed subject NPs.

1. I begin by taking up the basic observations underlying the claim in (1). Adopting Kayne's (1975, p. 30) suggestion that NPs like the object in (2) and the subject in (3) be analyzed as having the form I assume in (1), the contrast between the two sentences suggests an analysis in which the absence of c-command between *beaucoup* and the empty quantifier in (3) is the reason for its deviance.

- (2) Max a beaucoup lu de livres
Max has much/many read of books
"Max (has) read many books."
- (3) *De livres ont été beaucoup lus
Of books have been much/many read

In Obenauer (1976, p. 63ff.) I noted the contrast between sentences like (2) and (4):

- (4) *?la raison pour laquelle ont beaucoup manqué d'étudiants . . .³
the reason for which have many been-absent of students

(Like (2) is (5) which forms a minimal pair with (4)).

- (5) la raison pour laquelle il a beaucoup manqué d'étudiants . . .
 . . . (impers. subject) has many been-absent of students
 "the reason why there were many students absent . . ."

The assumption concerning (2) vs. (3) then leads to the idea that in (4), in spite of the surface similarity with (2) – i.e. of the linear order QP – V – [QPe] –, the empty quantifier is also not c-commanded by *beaucoup*. Given Kayne's (1979b) LF-movement rule, it follows that the place for c-command to be checked is in LF, after movement.

More precisely, assuming with Kayne that LF-movement is left adjunction to S, and that it must apply in (4) for the empty subject to be properly governed,⁴ we obtain for (4) the following structure in LF:

- (6) . . . [NP_i[QPe] d'étudiants] [S[NP_ie] ont beaucoup manqué . . .]

Unlike in (5), *beaucoup* does not c-command the [QPe] in (6).

Kayne's (1979b) recent proposal extends to the case of prepositional objects, for example (7), for which the c-command requirement is clearly insufficient.

- (7) *Il a beaucoup parlé à de personnes
 he has much/many spoken to of persons

These facts fall out in the desired way from his formulation of the Empty Category Principle, interpreted now as a principle requiring essentially a precise type of relation between an empty category (β) and a (non-empty) antecedent (α):

- (8) An empty category β must be governed, à la 'On Binding', by a coindexed category α ; or else there must exist a lexical category X such that X governs⁵ β and α governs some perc-projection of X.⁶

(Kayne (1979b), p. 27). I shall now show that this way of stating the ECP is not sufficient, and that it must be strengthened by the addition of the c-command requirement.

2. I start with observations involving the interrogative quantifier *combien* ('how much/many'). It is well known that *combien*, like *beaucoup*, can be part of a NP or quantify 'at a distance', i.e. that it can be related to (an empty QP in) an NP, subject or object, separated from it in S-Struc-

ture.⁷ Under an extraction interpretation, the trace of *combien* is coindexed through *wh*-movement with *combien* in COMP; the relevant structure in the case of the subject is (9):

- (9) $\bar{S}[\text{COMP}[\text{QP}_i \text{ combien}]] [\text{S}[\text{NP}[\text{QP}_i e] \text{ de filles}]] [\text{VP} \text{ voulaient partir}]]]$
 (10) Combien de filles voulaient partir?
 “How many girls wanted to leave?”

(Irrelevant structure of the VP has been omitted). Note that the empty element is well-formed with respect to (8); the structure in which it appears is transparent for government through NP (for a discussion of this transparency, cf. Kayne (1979b, pp. 36–39). As for government through S, the situation is the same as in

- (11) $\bar{S}[\text{COMP}[\text{NP}_i \text{ who}]] [\text{S}[\text{NP}_i e] [\text{VP} \text{ left}]]]$

(Sentence (10) is thus syntactically ambiguous, because it can also be considered as the result of *wh*-movement applied to the whole subject NP, in which case the empty subject is “locally” governed by its antecedent in the same way as the empty QP was in (9), but with only one intervening node).⁸

Kayne notes that his ECP can account for the impossibility of extraction from the embedded subject if government à la “On Binding” is impossible here.

- (12) *?Combien dis-tu que de filles voulaient partir?
 how many say you that of girls wanted to leave

This would follow, he suggests, from the assumption that the complementizer *que* prevents the trace of *combien* in the embedded COMP from governing outside COMP (“non-local” government as defined in the second half of (8) is also excluded) – cf. (13). Maintaining this assumption, I add the following: Either there is no index copying from the trace in COMP onto *que*, or such a copied index on *que* is not sufficient for the empty QP in the embedded subject to be correctly governed with respect to (8):

- (13)
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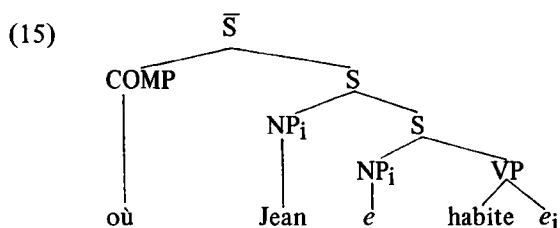
graph TD
 VP1[VP] --- V[V]
 VP1 --- Sbar[S̄]
 V --- dire[dire]
 Sbar --- COMP[COMP]
 Sbar --- S[S]
 COMP --- QP1[QPi]
 COMP --- que[que]
 QP1 --- e1[e]
 S --- NP[NP]
 S --- VP2[VP]
 NP --- QP2[QPi]
 NP --- filles[de filles]
 QP2 --- e2[e]
 VP2 --- dots[...]

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Turning now to the rule of Stylistic Inversion (Move NP), which has applied in (14),

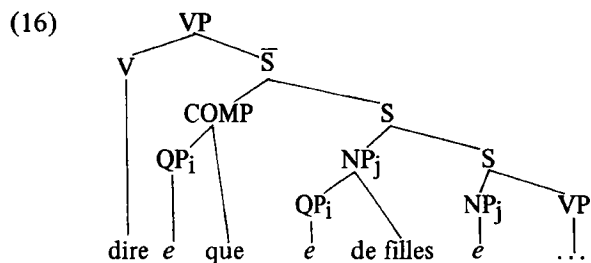
- (14) OÙ habite Jean?  
 "Where does Jean live?"

Kayne's rule of LF-movement of the inverted subject leads to (15), (trace of *où* omitted):



Here the moved NP is adjoined to the left of S (cf. (6)), from where it governs its trace in the subject position like *who* governs its trace in (11);<sup>9</sup> the post-verbal trace is governed via V by the subject trace.

Let's now turn to (12), with a subject containing *combien*, and apply Stylistic Inversion and LF-movement in the embedded sentence, a case Kayne didn't consider. The relevant structure is (16):



The empty NP in the subject position is again locally governed (by the LF-moved subject adjoined to S). As far as the empty QP inside the moved subject is concerned, the configuration 'COMP – NP<sub>j</sub>' is exactly the same as the COMP – NP configuration in (13), the sentence without Stylistic Inversion. In other words, on the assumptions made earlier concerning the presence of *que* in COMP, *e* in *e de filles* is not properly governed, and therefore the sentence should be ungrammatical. But (17), whose structure (16) is supposed to show, is (almost) perfect, as compared to (12).<sup>10</sup>

- (17) ?Combien dis-tu que voulaient partir de filles?

What should we conclude? Obviously not in the first place that the ECP – as formulated in (8) – is the wrong means of accounting for the deviance of (12), or that it is irrelevant in the case of (17), for some ad hoc reason. Rather, let's examine more closely the governance relations of the [QP $e$ ] in (17), which seems to be the crucial point. Compare the embedded version of (14), i.e. (18), which has the S-Structure (19):

- (18) Où dis-tu qu'habite Jean?  
 (19) où<sub>j</sub> dis-tu [ $\bar{S}$ [COMP[PP<sub>1</sub> $e$ ] que] e<sub>j</sub> habite Jean<sub>j</sub> ... ]

Given again the assumptions about c-command and *que*, it's clear that *Jean<sub>j</sub>* is not c-commanded (nor governed) by anything in COMP, and of course doesn't need to be. But *e* in *e de filles* does have to be governed, according to the ECP, and as confirmed by the unacceptability of (12), where it is not. We are thus left with the conclusion that the empty QP is governed in (17), contrary to what (16) apparently shows.

How could the [QP $e$ ] be governed? Kayne (1979b, Appendix) suggests that in the parallel non-embedded sentence,

- (20) ?Combien a été fabriquée de mayonnaise?

the explanation is LF-movement, that is, the structure *combien* [S[NP $e$  de mayonnaise] [S[NP $e$ ] ... ]], is a case of local government. Clearly this could work here, as in the Stylistic-Inversion variant of (10),

- (21) ?Combien voulaient partir de filles?

but not when *combien* is extracted out of its  $\bar{S}$ ; cf. (16). Note, furthermore, that there is no difference between (21) and (17) with respect to their acceptability, in spite of the apparent possibility of [QP $e$ ] being governed locally in (21).<sup>11</sup> I conclude that the empty QP in (17) is governed otherwise than locally (as well as its counterpart in (21)).<sup>12</sup>

How can this trace be governed non-locally? Let's illustrate the notion of percolation projection in the case of (17). Here, the verb *dire* governs the embedded  $\bar{S}$ . Kayne assumes that a government index (superscript) assigned to  $\bar{S}$  can percolate down to (S, VP, and) the head of this  $\bar{S}$ , that is V, which in turn can assign this percolated superscript to the elements it governs. Thus, the V *partir* bears the same superscript as the matrix V *dire*. Any projection of *dire* is now a percolation projection of the lower V *partir*: "A [S, for example] is a projection of C [*dire*], where C bears the superscript of B [*partir*], and C governs a projection of B [= the embedded  $\bar{S}$ ]" (Kayne 1979b, p. 27).

In accordance with the second clause of (8), there is now an antecedent,

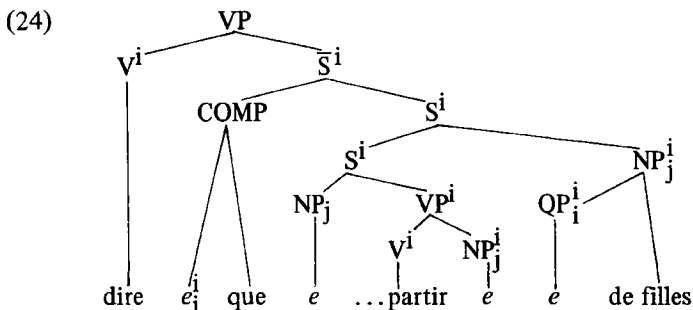
*combien*, in the upper COMP, which governs S (the *A* of Kayne's definition), a perc-projection of *partir*, the X that governs [*NP<sub>e</sub> de filles*] and [*QP<sub>e</sub>*] after Stylistic Inversion has applied. The empty QP is then governed in a way similar to its government in the case of an object and an *il*-moved subject:

- (22)a. Combien a-t-il invité de filles?  
 b. Combien dis-tu qu'il a invité de filles?  
 how many (say you that) he has invited of girls
- (23)a. Combien est-il venu de filles?  
 b. Combien dis-tu qu'il est venu de filles?  
 how many (say you that) 'there' is come of girls

Consequently, the Stylistic-Inversion-moved subject must "land" in a position where it is governed by V.<sup>13</sup>

The empty QP in (17) is thus governed, but not yet the empty subject. I assume, following Kayne, that the extraposed subject must be further moved so as to prevent its trace from violating the ECP; the only possibility seems to be local government. This can be achieved in LF, provided that the empty QP remains governed even if it is moved away from its governing verb; note that the ECP must be satisfied *in LF*. We can express this by saying that the [*QP<sub>e</sub>*] in the subject keeps the government superscript it has been assigned as a consequence of Stylistic Inversion.<sup>14</sup> More generally, elements which are governed at S-Structure must be able to carry their superscripts along under subsequent movements.<sup>15</sup>

It follows that, as far as the empty QP is concerned, LF-movement does not need to move the subject to the left (that is, in terms of linear order, between COMP and S) as Kayne suggested to account for the well-formedness of the – unembedded – (20). As for the subject NP, all that would be needed is to make it govern its trace, dispensing with the leftward movement and maintaining the linear order of the surface by simply adjoining the NP to the right of S.<sup>16</sup> I shall assume this version of LF-‘movement’; given superscript assignment and percolation at S-Structure as described above, the following structure obtains in LF:



To summarize the results to this point:

- The empty QP in the extraposed subject NP is governed via V in S-Structure;
- This QP remains governed after the adjunction of the subject to S;<sup>17</sup>
- It may be possible to maintain the linear order of S-Structure in LF. Actually, this depends crucially on the possibility of redefining ‘local’ government in purely hierarchical terms, so as to allow, for example, the (linearly) intervening VP in (24).<sup>18</sup>

3. Let’s apply this result to some other cases of NPs containing empty quantifiers. Muller (1977, p. 181), cited by Kayne (1979b), gives examples of the following type:

- (25) \*?un roman que n’ont pas lu de critiques . . .  
a novel that not have read of critics

Milner (1978, p. 692) and Obenauer (1978, p. 391), both cited by Kayne, give examples like:

- (26) \*?Le client pour qui a été tant fabriquée de mayonnaise . . .  
the customer for whom has been so much made of mayonnaise

In both cases, *lire*, *fabriquer* assign their superscripts to the empty QP; the extraposed subject is then adjoined to S, and the derived structure is comparable to (24); cf.

- (27) . . . [S[S[NP<sub>j</sub>e] a été [QP tant] fabriquée [NP<sub>j</sub>e] . . .] [NP<sub>j</sub>[QP e]  
de mayonnaise]]

Yet these sentences, unlike (17) (and (20)/(21)), are ill-formed.

Kayne (1979b, Appendix) attributed the ill-formedness of ((25) and (26) to the ungoverned status of the empty QP in LF. We have seen, to the contrary, that it remains governed after the application of the LF rule. As it is governed, it satisfies the ECP as formulated in the second part of (8): there is a lexical category X (*lire*, *fabriquer*) governing the empty QP, and there is an  $\alpha$  (*tant*, (*ne*) *pas*) governing X. That elements like *tant*, (*ne*) *pas* are possible antecedents for empty QPs is shown by (28) and (29):

- (28) Je ne connais pas de critiques  
I not know of critics
- (29) Il a été tant fabriqué de mayonnaise (que . . .)  
‘there’ has been so much made of mayonnaise (that . . .)

(cf. (4) vs. (5)).

The obvious structural difference between (17), (20), (21) on the one hand, and (25), (26) on the other, is that while the extraposed NP is in the same position, the antecedent is not; *combien* c-commands [QP *e*] at LF, but *tant*, (*ne*) *pas* do not, even though they did so in S-Structure. Therefore, the correct relationship between the antecedent and the empty category seems, in the general case, to require:

- (30)a. Government of the empty category by a lexical category, according to the specifications in (8), which must be achieved at S-Structure, and furthermore  
 b. c-command of the empty category by the antecedent, which must hold at LF

The second condition also provides a natural account for Kayne's example (= his (121); cf. above, note 17):

- (31) \*une fille qu'en détestent trois ...  
 a girl that of-them detest three

where *e* (= the trace of *en*) in [NP *trois e*], though governed by *detester* even at LF, is no longer c-commanded by *en*.<sup>19</sup>

Similarly, the c-command condition rules out the second derivation of 'Combien en a-t-il?' ('how many of-them has he'):

- (32) [QP *combien*] ... *en*<sub>i</sub> V ... [NP [QP *e*] [NP/PP<sub>i</sub> *e*]]  
 (33) [NP [QP *combien*] [NP/PP<sub>i</sub> *e*]] ... *en*<sub>i</sub> V ... [NP *e*]

(Superscripts and irrelevant subscripts omitted.) In (33), the trace of *en* is governed (by V), but not c-commanded by *en*, contrary to (32); hence only (32), the structure where the QP has been extracted out of the NP which contains it, is well-formed.<sup>20</sup>

4. The 'supplemented' ECP in (30) is in line with Kayne's (1979b, p. 22) interpretation of this condition, which, he claims, is "fundamentally a principle that requires a (non-empty) antecedent for an empty category". He sees the role of government by a lexical category – V in the cases considered here – as "subsidiary": "... the V ... serve[s] essentially the purpose of 'connecting' the empty category to its antecedent".

The results reached here lead to a slight reconsideration of the role of V in the formulation of the ECP. (8) seems to assume that V links together two parts of a path leading in LF from the antecedent to the empty element via the V minimally governing [ $\beta$  *e*]. (24) shows that this is not



necessarily so. Here, the path linking *combien* and the [QP *e*] in the embedded subject does not pass through *partir*, which nevertheless plays a crucial role in transmitting its superscript to (the NP and) the [QP *e*] (recall the contrast with the PP case (7)).

The difference between examples involving *-wh* and *+wh* quantifiers<sup>21</sup> has shown the non-identity of the ‘government percolation path’ and the c-command path. We have seen that the information about the governance relations at S-Structure is preserved in LF, where the ‘ECP path’ is determined on the basis of c-command. This second ‘ingredient’ of the Empty Category Principle is quite natural within the framework of anaphora.

## NOTES

1. In the linguistics seminar, Maison des Sciences de l’Homme, May 1979.
2. I understand ‘quantifier’ here in a syntactic sense (‘antecedent of an empty QP’), which does not imply that these elements are subject to the rule QR.
3. For the less than complete unacceptability of (4), cf. Kayne (1979b, fn. 8).
4. But not in (5), where the insertion of *il* removes the government requirement for the empty subject. Cf. Kayne (1979a).
5. Kayne’s formulation actually reads “... such that X perc[olation] governs...” As the difference is of no importance for my argument, I shall use the usual term “govern”. – Recall that Chomsky’s (1980) definition states that:

$\alpha$  is governed by  $\beta$  if  $\alpha$  is c-commanded by  $\beta$  and no major category or major category boundary appears between  $\alpha$  and  $\beta$ .

6. Kayne’s notion of perc-projection includes the familiar notion of projection (in the sense of  $\bar{X}$  Theory) and extends it to some degree. I shall return below to a relevant case.
7. Cf. Kayne (1975), Obenauer (1976, 1978), Milner (1978).
8. That sentences like (10) are indeed syntactically ambiguous follows, given the assumptions in the text above, from the correctness of the two following claims:
  - the relevant structural configuration governor – governee is the same in the case of ‘local’ government by an antecedent (cf. (9)) and government by a lexical category, for example V, like in ‘Combien a-t-il invité de filles’ (= (22), below);
  - the string *de filles* does not have to be extracted from the NP *combien de filles*, by some kind of restructuring rule, prior to the fronting of *combien* (in which case the fronted element could be NP[*combien - e*], and *de filles* would not correctly bind its trace, ruled out by the ECP; or the restructuring might be impossible in preverbal position, so that again only fronting of the whole subject NP could lead to (10)).

I adopt the former claim, and take the latter to be strongly supported by the syntactic behavior of the ‘separate’ construction. The general reason is that several unexpected facts involving the string *de ...* and noted in Obenauer (1976, 1978) seem to be difficult to handle if one assumes this string to be ‘split away’ from the QP. In contrast, the assumption that, subsequent to *wh*-movement, the string contains an empty category – the trace of *combien* (cf. (9)) – leads to a straightforward account of these facts (see Kayne (1979b)). Cf. also Obenauer (1978, pp. 383–385).

In other words, I consider that it is the QP (*combien*) that is optionally extracted from the quantified NP (I differ here from Couquaux (1980)). A parallel reasoning holds for analogous facts in comparatives.

9. Within Chomsky's (forthcoming) Binding Theory, the subject trace, being free in its governing category (if this category is S), must be a variable. Kayne assumes that the subject of (15), *Jean*, may undergo a quantification rule. I'm only concerned here with the empty category aspect of the question.

10. Contrary to the other cases of *combien*-extraction, its combination with Stylistic Inversion is considered dubious by some speakers; for other speakers, the acceptability of the construction varies, depending on certain properties of the verb in ways still unclear (cf. Obenauer 1976, pp. 25f.). I shall not deal with this question in what follows.

11. It might in fact be the case that no government is possible from COMP into the LF-movement position.

12. Robert May suggested at the workshop that Q-Raising of *e de filles* into the upper  $\bar{S}$  containing *combien* could achieve local government for the empty QP. However, even if QR were applicable here, the subject trace would have to be governed by a trace left by QR. Even if there were such a trace, it should have to satisfy in turn the ECP. Kayne's (to appear) data concerning *ne ... personne* indicate that this would be impossible for the same reasons as government of *e [de filles]* by *combien* in (12); cf. Kayne's percolation mechanism with respect to a 'non-head 'offspring'' in the  $\bar{X}$  schema (1979b, p. 20).

13. Cf. Kayne (1979b, p. 52).

14. For the percolation into a NP, cf. text after (10).

15. For a different case pointing to the same conclusion, cf. Kayne (1979b, p. 45).

16. This possibility could be interpreted as indicating that LF-'movement' is in fact a transformation taking place prior to S-Str. Apart from the question of the status of 'string-preserving' rules, such a decision would complicate the superscript assignment operation, which would have to be located after Stylistic Inversion, but before the 'transformation' ex-LF-movement.

17. Kayne (1979b, p. 46) assumes that "an empty category that can satisfy the ECP only via V must not be separated from that V by the S that dominates that V". Actually, (24) exhibits precisely this kind of configuration, whether the subject is right or left adjoined to S. I shall show below that the problem which motivated Kayne's proposition can be naturally solved in another way.

18. I cannot exclude (leftward) movement in LF; in the absence of clear arguments for it, I postulate what seems to be minimally required. We have to determine in which ways linear order can be changed in LF; relevant in this respect is the question of the position, in LF, of post-subject complements to the verb. In many cases, such complements are excluded in S-Structure; they must rather precede the moved subject (cf. Kayne (1972)). In a more restricted class of cases, the moved subject can appear between V and its (preferably prepositional) complements. Discussion of this topic exceeds the scope of this paper. For the latter type, see Obenauer (in preparation). – Another relevant point is the quantification of the subject NP (cf. notes 9 and 12).

19. The definition of c-command relevant here is the "extended" definition of Reinhart (1976). – This account of (31) is not invalidated by the observation that

(i) \*Il l'en déteste trois.

is ungrammatical, although *en* c-commands its trace (cf. note 4). (i) is excluded, not by the ECP, but presumably for the same reason as

(ii) \*Il la déteste trois personnes.

which contains no empty element (apart from the correctly governed trace of *la*). For a proposal concerning *il*, see Kayne (1979b, p. 47 and fn. 47).

20. Cf. note 8 as to the legitimacy of this kind of movement. Notice also that the 'layered' trace in (32) results from application of *two* transformations.

21. The analysis proposed for the *combien* facts extends to, for example, comparatives of the type

- (i) ?Plus de filles voulaient partir qu'il dit que voulaient rester de garçons.  
more of girls wanted to leave than he says that wanted to stay of boys

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