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Remarks and Replies

Avoiding Reference to Subject

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For generations, descriptions of natural language grammar have made use of notions like subject, direct object, and indirect object.[1] The character of these concepts and their exact role in linguistic theory can still not be said to be clear.[2] Nonetheless, it would be rash to imagine that grammatical description can dispense with them.

For some time it has been common to suggest that transformational grammar is in significant part a reconstruction of traditional grammar.[3] Despite this, within the theory of generative transformational grammar (TG) as understood by its original formulator, N. Chomsky, the following statement holds:

(1) No transformational rule can refer to notions like subject, etc.[4]

Some readers may doubt that (1) is a correct characterization of transformational theory.[5] Such doubts could be motivated by the following (cf. also footnote 8). Much of the actual descriptive work ostensibly done in a transformational framework ignores (1) and states rules violating the conditions that entail it.[6,7] This in-

[1] The construction of this article has greatly benefited from criticisms and suggestions by David Johnson, David Perlmutter, Stanley Peters, Warren Plath, Haj Ross, and several anonymous reviewers for *Linguistic Inquiry*. It would have been even worse without their help and probably better if I had taken more of their advice.

[2] For proposed theories in which these notions figure as the fundamental primitives of clause structure, cf. Perlmutter and Postal (to appear) and Johnson (1974a, 1974b, to appear).

[3] Cf. Chomsky (1964, 11, 15).

[4] The notation "subject, etc." will often serve as an abbreviation for "subject, direct object, and indirect object". The context makes it clear when this is intended.

[5] The validity of (1) was kindly verified by N. Chomsky, personal communication of November 28, 1974.

[6] The relevant conditions are those excluding quantificational statements from the formulations of the structural descriptions of transformations. Cf. the discussion of Lasnik and Fiengo's remarks in the text, as well as (6) and (7) below. Presumably, the trouble with (7) from this point of view is that it involves a statement of the form (i):

(i) There exists a constituent of the category S, S_1, such that terms 2 and 3 are all and only the immediate constituents of S_1.

This involves both universal and existential quantification.

[7] For only a few examples of "transformational" descriptions that violate these conditions, see the following works: Aissen (1974a, 345); Berman (1974, 10); Bresnan (1971, 266); Bresnan (1973, 278, 307, 327);

consistency has helped obscure the empirical deficiency of a theory imposing condition (1) on grammars.[8] If it had been generally realized that TG in Chomsky's sense precludes rules that refer to subject, some of the work involving formulation of such rules might have been cast in the form of arguments showing the incorrectness of the theory.

Some remarks by Lasnik and Fiengo (henceforth: LF) (1974, 554) can help us examine these questions by focusing on particular empirical issues. Following work by Emonds (1970), Bresnan (1971), and others, LF propose to analyze certain constructions of English in terms of V(erb) P(hrase) constituents that are *not* introduced in base structures as sisters of subject NP. Let us refer to such a structure as an *orphan VP*.[9]

In response to criticisms of certain implications of such analyses, LF argue as follows (1974, 554):

> (2) At first glance, it might appear that the VP analysis would make it difficult to state rules such as those involving floating quantifiers, floating emphatic reflexives, and number agreement. This impression might arise from the widespread assumption that these rules must mention *subject* NPs. We will illustrate the rules mentioned and assumed to depend on subject NPs, with examples involving the verb *convince*.
>
> (89) a. Melvin convinced the men to each solve the problem.
> b. Joan convinced Susan to drive to N.Y. herself.
> c. Harry convinced the men to become { doctors / *a doctor }.
>
> We see no reason, however, to make the radical assumption that transformations can make use of structural dependencies at all levels simultaneously. Since it is clear that the class of possible operations on trees involving only string conditions (as in Chomsky 1957) is a proper subset of the class of operations involving linear order and structural dependency, in the absence of any falsifying data the stronger theory—the former—must be maintained. Within current formalizations of transformational grammar, the operations mentioned would all involve

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Dougherty (1970, 876); Emonds (1970, 123, 129, 137); Fauconnier (1974, 198); Jackendoff (1974, 29); Klima (1964, 256, 272, 301); Lakoff and Peters (1969, 114, 127); Postal (1971, 112, 115, 116, 134, 141, 203, 215); Rosenbaum (1967, 5, 6); Ross (1969a, 192); Ross (1969b, 289); Smith (1969, 256); Stockwell, Schachter, and Partee (1968, 297, 301, 313).

The members of this small sample do not cluster in time nor do they fall into any particular school or point of view with respect to the various controversies that have divided generative grammarians in recent years.

[8] The major reason it is hard to accept that (1) is characteristic of transformational theory is more straightforward. For generations, grammars of the most diverse languages have contained rules referring to subject, etc. The majority of these (e.g. subject-verb agreement, nominative case marking) are inexpressible in terms of base rules because they apply to derived as well as base-generated subjects.

Thus (1) would appear to amount to the claim that such rules, e.g. subject-verb agreement, do not exist. This obviously cannot be what is meant by supporters of (1). But so far they have offered little to eliminate the conflict between (1) and well-established linguistic fact. Cf. footnote 29 for further comments.

[9] Certain readers may object to this terminology, as follows. Such VPs lack subject NP sister constituents. But people who lack sisters are not necessarily orphans. Ergo, the terminology is poor. However, all such VPs also lack a dominating S node, which would be the parent of the not recognized subject NP and the VP.

X – NP – Y – A, where A is some item involved in the rules. Such a rule could not distinguish $_{VP}$[V NP VP] from $_{S}$[NP VP]. Hence there is no problem in accounting for the processes evidenced in (89) above within the VP framework; in fact it would be difficult to prevent the processes from applying.

(2) is the whole of the authors' response to the relevant criticisms. LF had proposed to analyze sentences like (3), such that the italicized sequences are orphan VPs.

(3) Melvin is {hard / easy / tough / a cinch} (for us) *to* {*visit* / *get Barbara to visit*}.

It was pointed out that there exist sentences like (4):

(4) Melvin is {hard / easy / tough / a cinch} for us to all visit at once.

In these, what is an orphan VP in LF's terms *contains a floating quantifier* (henceforth: Q), in this case, *all*.[10] It was claimed that this falsifies the orphan VP analysis because of the principle shown in (5):

(5) Floating Q can only be launched from subject NPs.[11]

[10] The other universal Qs that float are *both* and *each*. It is unclear why these three float while *every* and *any* do not. Nor does it follow from anything at the moment that only universal Q can float in English (unlike Japanese, for example).

It is possible that the exclusion of *every* and *any* from Q floating should not be built into the rule of Q Floating itself. The latter could then simply refer to universal Q. The ill-formedness of examples like (i) could then be attributed to superficial "part of speech" restrictions.

(i) *The marines can {every / any} hit the target.

That is, it could be said that *any* and *every*, unlike *all*, *both*, and *each*, cannot occur as superficial clause constituents. Since floating Q share many properties with so-called adverbs, possibly this might be stated by specifying that *any* and *every* cannot be superficial adverbs, on the assumption that Q Floating somehow brings about the ultimate assignment of adverbial status to the floated Q.

[11] I am distinguishing here between a process of Q floating, which has the effect of leaving the Q a clause constituent (taking all so-called VP, AP, etc., as clauses) and that process illustrated in (ib):

(i) a. He hates all of them.
b. He hates them all.

The process at work in (ib) is evidently not limited to subject NP. For many speakers, including the present writer, the rule relevant to (ib) is limited to *all* and *both*:

(ii) *He hates them each.

For many speakers, again including the present writer, it is also restricted to cases like (ia) where the post-*of* NP is pronominal:

(iii) *He hates the boys {each / all / both}.

For speakers with the restrictions in (ii) and (iii), the process in (ib) is distinguished from what I am calling Q floating independently of questions of subjecthood, since Q floating seems to uniformly involve the three Q *all*, *both*, and *each* and is not restricted to pronouns.

In LF's analysis, by definition, there is never a subject NP in association with the orphan VP, and hence there is no possible source for the floating Q.[12] Other phe-

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However, some speakers do not have the constraints in (ii) and (iii). Several reviewers of an early version of this article provided the following examples, which are perfectly well-formed for them, though not for me:

(iv) a. He gave the boys all books.
b. He gave the boys each a book.
c. I gave the boys each a quarter.
d. I gave the boys both a quarter.

Moreover, one of them claimed to accept my (34b) in the text below:

(v) I won those beads all playing poker.

In general, these cases seem to me to involve the rule operative in (ib) in my dialect, but not subject to as strict constraints. However, at least those involving *each* may, alternatively, be functions of the rule Each Shift, discussed in footnote 26.

It has sometimes been assumed (e.g. in Postal (1974, 4.5) and Dougherty (1970)), that the rule operative in examples like (ib) is an integral part of what is here called Q Floating. I now claim that this is an error and view these processes as entirely distinct. Clearly, if they are not distinguished, then the claim that Q Floating is restricted to subjects is overthrown, as noted by those reviewers who proposed examples like those in (iv).

My hypothesis is, however, that in cases like (ib) the sequence *them all* is an NP in derived structure. Thus the rule that relates such a sequence to *all of them* is one that is *internal to NP*. In fact, I think this kind of rule should be construed as one of many that have the effect of taking an element that is not the *head* of an NP and making it the new head, displacing the original head from this status. Thus, *all of them* is an NP in which *them* is not the *head*, which is why it can occur as a finite clause subject instead of **all of they*. However, *them all* is an NP with *them* as head; hence, it cannot be used in finite clause subject position, where at best *they all* is required, according to the general rules for *they/them*:

(vi) I saw {them / *they} (all).

(vii) {They / *Them} (all) (recently) saw me.

Other cases of head changing rules are those underlying such phrases as (viii):

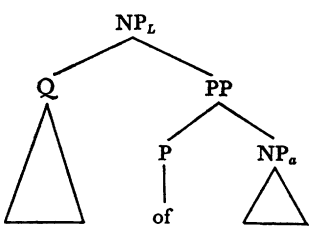
(viii) that idiot of a president

where *president* is the underlying head and *idiot* is part of a modifier, in accord with the meaning, which is essentially 'that idiotic president'.

My claim, then, is that the rule that brings about the postposing of universal Q in cases like (vi), etc., is one internal to NP; it is thus distinct from Q Floating, which (i) separates the Q from the rest of the phrase and (ii) makes it a clause constituent. Therefore, unless this differentiation can be falsified, the fact that the process illustrated in (vi) is not confined to subjects has no bearing on the question of the relevance of subjecthood to Q Floating.

[12] For simplicity in this discussion, I shall assume that Q are launched from a structure of the form:

(i)



This is quite artificial, but in ways peripheral to the present discussion. In particular, note that, in a system where quantifiers in general are higher predicates moved to their ultimate loci by lowering rules, floating of Q would, paradoxically but consistently, take place at a point when NP$_L$ contains no Q. The floating would involve as its crucial component the claim that NP$_a$ takes on the status originally held by NP$_L$. For some elaboration, see below in the text. I make no attempt here to provide a statement of the rule Q Floating, since this is not possible outside of an articulated relational framework. Cf. below and Perlmutter and Postal (to appear).

nomena subject to a principle analogous to (5) were also pointed out as incompatible with LF's analysis. But, for simplicity, the present discussion is restricted to floating Q.

The logic of these criticisms was straightforward. Orphan VP analyses of certain sequences *G* predict that *G* can have no properties determined by rules restricted to subjects (of those VPs). But the constructions analyzed by LF have just such features.

LF's response to this criticism, (2), is simply to reject the claim that the processes in question involve reference to the notion of subject. Focusing more narrowly, they reject (5). In so doing, they in effect state and explicate the basis for principle (1) above.

LF's reasoning is evidently as follows. To state a transformation referring only to subjects it would be necessary to supplement a condition of the form (6)[13] with a further condition that terms 2 and 3 together form an S. That is, it would be necessary to state (7):

(6) X, NP, VP, Y
1 2 3 4

(7) X, [$_S$NP, VP$_S$], Y
1 2 3 4

But structural descriptions like (7) are blocked in TG as understood by Chomsky and LF, presumably as a consequence of restrictions on the use of quantifiers.

Only "single string" conditions like (6) are permissible.[14] Therefore, the theory to which LF adhere prevents any statement of the process of Q floating along the lines of (7) and forces a statement like (6), a vague version of which they advance in (2).[15] Since their theory makes it impossible to represent what they agree is "the widespread assumption" that subjecthood is involved, they reject that view.

[13] We touch here on a deeper inadequacy of transformational theory (of all variants) than that represented by principle (1). Even when conditions like those leading to (1) are abandoned, this theory provides no nonarbitrary way to refer to subject, etc. It is strange to assume, as in Chomsky (1965), that a notion like VP could be central to a characterization of subjecthood. This is without plausibility on cross-linguistic grounds. In many languages (e.g. those with "free" word order), there seems no basis at all for recognizing a VP. And a VP-based theory of subjecthood is incompatible with the well-documented existence of VSO languages (barring empty manipulations that convert these to underlying non-VSO languages by fiat). VP-based definitions of direct object are likewise unsupportable. For indirect object, no configurational definition has, to my knowledge, even been offered.

Although this matter cannot be dealt with here, in rejecting principle (1) and arguing that grammars must permit rules referring directly to subjecthood, I am *not* claiming that statements like (7) in the text are the proper way to achieve this reference. Cf. Perlmutter and Postal (to appear).

[14] D. Perlmutter has recently introduced terminology that distinguishes theories permitting rules like (6) and (7) from those permitting only those like (6). He refers to the former as *arboreal grammar*, the latter as *transformational grammar*. This is historically reasonable, since the inventor and best known advocate of generative "transformational" description is an upholder of the restriction to rules like (6). It has the drawback that most of the work that is called "transformational" in the literature is actually arboreal. Cf. footnote 7.

[15] It is not possible to determine the full scope of the failure of such a rule without knowing what conditions are to be imposed on the variable Y, intervening between the crucial elements. I avoid this below. This is accomplished by restricting attention to cases that would work under essentially *any* possible account of such a variable, namely, where it stands for nothing but the null element. That is, all the counterexamples provided below have nothing at all between the relevant constituents.

This leads LF to the claim, which they do not defend, that elimination of reference to subjecthood is adequate. In their terms, ". . . there is no problem . . .". They give an example (their (89a)), which I repeat here:

(8) Melvin convinced the men to each solve the problem.

Presumably, this is intended (by itself) to illustrate not only that there is no problem in eliminating reference to subjecthood but even that this is necessary. That is, it may appear in examples like (8) that the floating Q has been launched from a nonsubject, *the men*, which is the direct object of *convinced*. This is what LF assume.

Before considering the relative adequacy of such an account and one based on principle (5), a clarification is necessary. A principle like (5) is necessarily ambiguous. For example, with respect to a passive clause, do principles like (5) refer to the initial subject existing before the rule Passive applies, to the subject derived by Passive, to both, to neither, etc.? These questions reveal that grammatical description based on subjecthood and similar notions must take account of the fact that subject status can change during (part of) the course of derivations. What is the subject of a clause that undergoes Passive before this rule applies, is not the subject afterward. To be precise, any description in terms of subjecthood must specify the relevant level or levels at which the subject condition must be met.

For a particular clause structure C, distinguish the following relevant stages for grammatical relations like subject:

(9) a. The initial structure (that created by base rules);[16]

b. The structure at the end of the (sub)cycle determined by C; and
c. The structure at the end of the entire cycle.

Let us refer to subjects at these levels respectively as:

(10) a. Initial subjects
b. Cyclic subjects
c. Shallow subjects

An NP that is a subject at some (unspecified) stage can be referred to as a *some time subject*, while an NP that is subject at some particular stage $\mathcal{J}$ relevant for the application of some rule can be called the *current*($\mathcal{J}$) *subject*.

A relationally-based account will claim that different rules and constraints refer to notions of subjecthood at different levels. Passive (in English and, more generally, in universal grammar) applies to current direct objects. These will not always also

[16] The parenthesized clarification is an oversimplification. The initial subject, etc., of a verb is the first one it has in a derivation. Typically, this is the one generated by base rules. But, in cases where postbase rules create new compound verbs (as in the case of so-called Predicate Raising or Verb Raising rules), the initial subject, etc., of the derived verb is the one one that it has in the output of the rule that creates it. This has no bearing on the present discussion.

be initial direct objects. They will not be when Passive applies to the output of direct object-creating rules like those operative in (11) and (12):

(11) a. Melvin gave the ball to Claude $\xrightarrow{\text{Indirect Object becomes Direct Object}}$
b. Melvin gave Claude the ball $\xrightarrow{\text{Passive}}$
c. Claude was given the ball by Melvin.

(12) a. Melvin proved Tony was insane $\xrightarrow{\text{Complement Subject becomes Main Clause Direct Object}}$
b. Melvin proved Tony to be insane $\xrightarrow{\text{Passive}}$
c. Tony was proved by Melvin to be insane.

In no case does Passive operate on cyclic or shallow direct objects (of the verb that governs application of Passive) since the very operation of the rule destroys the direct object status. Thus *Tony* in (12c) is not a cyclic or shallow object of anything. Note that while *Tony* in both (12a,b) is a cyclic subject of *be*, only *Tony* in (12a) is a shallow subject of *be*. *Tony* in (12b) is the shallow direct object of *proved*.

Further, Postal (1974, 83–91) illustrates a constraint on the rule Complex NP Shift. This constraint refers to shallow subjects:

(13) a. *Is extremely happy – that Watergate figure who was just paroled.
b. *(For) to confess – (for) the doctor who strangled all of his female patients would be surprising.

(14) I believe $\left\{\begin{matrix}\text{*is} \\ \text{to be}\end{matrix}\right\}$ insane – the doctor who strangled all of his female patients.

Similarly, the subjects referred to in the rule Subject-Auxiliary Inversion (and, I suggest, all *word order rules* referring to subject) are shallow subjects. I do not know of a clear case of reference to initial subjects in English. However, noun incorporation into verbs in Mohawk (and Iroquoian languages generally, cf. Woodbury (1975)) applies from both subjects and objects. These must apparently be initial subjects and objects, since subject- and object-creating rules in Mohawk do not feed incorporation. The new subjects and objects created cannot be incorporated, and the earlier subjects and objects that are expelled from these statuses still can.

These sketchy remarks illustrate how descriptions in terms of grammatical relations must be specified as to level(s). Consider again the rule that launches floating Q. I claimed this was governed by principle (5), which is vague as to level. The proper specification to make it precise involves the notion of cyclic subject. An initial statement (to be revised somewhat below) is that a Q that is part of[17] a complex NP, NP_L, can be made a sister of a V, V_t, only if NP_L is the cyclic subject of V_t. Consider the more obvious consequences of this view.

[17] Cf. footnote 12. Moreover, this statement is only a *necessary* condition on NP_L. There is no implication that all NPs meeting this can launch floating Q.

First, it predicts that NPs that do not start out as subjects and never undergo subject-creating rules cannot launch Q:

(15) a. He has checked all of the nurses.
b. *He all has checked the nurses.
c. *He has all checked the nurses.

(16) a. I wrote scurrilous letters to both of the candidates.
b. To both of the candidates, I wrote scurrilous letters.
c. *I both wrote scurrilous letters to the candidates.
d. *To the candidates, I both wrote scurrilous letters.

Then, it predicts that the new subject created by Passive[18] can launch Q, but that the initial subject displaced cannot:[19]

(17) a. All of the robots tickled her.
b. The robots all tickled her.
c. She was tickled by all of the robots.
d. *She all was tickled by the robots.
e. *She was all tickled by the robots.

(18) a. She adjusted all of the robots.
b. *She all adjusted the robots.

[18] This is a simplification, since passive clauses are embedded subjects of the intransitive auxiliary *be*, which obligatorily triggers application of the rule s-Raising (cf. footnote 20). Hence, in (17c) in the text, *she* becomes the cyclic subject of *tickled* because of Passive. But it becomes the cyclic and shallow subject of *was* because of s-Raising. This treatment of *be* combines with the cyclic subject description of floating Q to predict automatically the alternative positions of the Q in cases like (18d,e). Such positioning is possible because the relevant NP is the cyclic subject of both *adjusted* and *were*. This approach generalizes to cases like (ia–e):

(i) a. All of the rockets will have been decaying for some time.
b. The rockets will have been (probably) all decaying for some time.
c. The rockets will have all been decaying for some time.
d. The rockets will all have been decaying for some time.
e. The rockets all will have been decaying for some time.

It does so if *all auxiliaries* are treated as intransitive verbs taking their complements as subjects and obligatorily triggering s-Raising.

(ib) without *probably* is bad for many speakers because of an output condition blocking untensed *be* directly before a Q, that is,

$$*\text{be}\left(\begin{Bmatrix}\text{ing}\\ \text{en}\end{Bmatrix}\right)\text{Q}.$$

[19] Of course, the new subject created by Passive is predicted to be a source of floating Q only if it stays the subject of the passivized verb until the end of the cycle determined by that verb. If it is displaced by some subsequent derived subject, then Q floating is predicted to be impossible. There are such cases, namely, when so-called Extraposition operates, replacing the complement subject by the dummy subject *it*. Compare (ia) and (ib):

(i) a. That Tricky was guilty and that Pat knew it can (both) be proved quite easily.
b. It can (*both) be proved quite easily that Tricky was guilty and that Pat knew it.

Of course, this assumes the cyclicity of Extraposition (cf. Jacobson and Neubauer (1974)).

A similar nonpassive case involving a distinct rule introducing dummy *it* (called Noun Phrase Extraposition by Elliot (1971)) is illustrated by (ii):

(ii) a. The things they are doing in Washington are (all) awful.
b. It is (*all) awful, the things they are doing in Washington.

c. All of the robots were adjusted by her.
d. The robots all were adjusted by her.
e. The robots were all adjusted by her.

Similarly, it predicts that an NP that undergoes s-Raising[20] with a verb like *seem* can leave its Q behind on the downstairs V of which it was the cyclic subject, or can leave it on the upstairs V of which it becomes the cyclic subject:

(19) a. All of the gorillas seem to like bananas.
b. The gorillas seem to all like bananas.
c. The gorillas all seem to like bananas.

Further, it predicts that when o-Raising operates, triggered by a verb like *believe*, the NP that is raised can leave its Q behind on the downstairs V of which it was the cyclic subject:

(20) Melvin believes the gorillas to all like bananas.

These predictions are all correct.

Let us now return to LF's treatment, in particular, the description of their (89a) (= my (8)). In LF's terms, the Q in this example has floated independently of subjecthood. In mine, however, the Q gives the appearance of having floated from the cyclic and shallow direct object of *convinced* only because the larger NP that originally contained it was the cyclic subject of the downstairs V, *solve*. There are at least three different analyses under which my suggestion would hold:

(21) a. A subject raising analysis involving o-Raising, parallel to that for verbs like *believe*, *prove*, etc. (cf. Postal (1974));
b. A complement subject deletion analysis involving Equi, parallel to that for *want*, *wish*, etc.;
c. A verb raising or clause combination analysis.[21]

Under (21a), the NP *the men* (more precisely, the larger NP containing it; cf. footnote 12) would start out as the initial subject of *solve* and would become the derived direct object of *convince* only on the *convince* cycle as a function of o-Raising. This NP would then be the cyclic subject of *solve*, since no rule would have displaced it. Under (21b), *each* would not have floated from a larger NP containing *the men*, but rather from a

[20] In this account, I terminologically distinguish between subject-creating raising of complement subjects, s-Raising, and object-creating raising of complement subjects, o-Raising. These are jointly referred to as Raising in Postal (1974). Recent work casts doubt on the claim that they are a single rule (cf. Szamosi (1973), Akmajian (1973), Berman (1974), Ruwet (1972, 221–223), and Perlmutter and Postal (to appear)). This is irrelevant to present concerns.

[21] Such analyses have been suggested both for cases in which the result is a single lexical item and for those in which the result is morphologically complex, either a multimorpheme word (as in Japanese or Turkish causatives) or two words (as in French causatives). For analyses of the former sort, cf. Green (1971); Lakoff (1970a, 1970b, 1970c); McCawley (1968, 1971); Postal (1970, 1974); Seuren (1974b). For analyses of the latter sort, cf. Aissen (1974a, 1974b); Kayne (1969, 1975); Kuroda (1965); Ruwet (1972); Seuren (1974b).

larger NP containing a pronoun coreferential to *the men*, subsequently deleted by Equi. A deletion analysis is the only kind feasible in cases like (22):[22]

(22) The gorillas$_m$ entered the cage and then (they$_m$) quickly all took baths.

Under (21c), the main clause would be derived from a causative structure of schematically the form (23):

(23) [Melvin (do X)] CAUSE [the men$_t$ AGREE [each of them$_t$ solve the problem]]

Floating of the Q would be determined by *solve*; the pronoun would be deleted by Equi on the AGREE cycle; and the CAUSE and AGREE clauses would be compressed on the CAUSE cycle by a Verb Raising rule. I favor an analysis of the third type, though that fact is irrelevant here—the key point is that there is a range of analyses consistent with principle (5), interpreted to refer to cyclic subject.

It may appear that LF's approach and the one proposed here are equally adequate for the description of floating Q. A proponent of their position might argue that the approach outlined here is empty, since one can always "create" an abstract structure in which the cyclic subject condition holds, even if it "really" does not. It might be claimed that my analysis of *convince* is just such a case.

This criticism, straw man or not, is not viable. The analysis suggested here is potentially incompatible with an approach like LF's and, more importantly, with the facts, in a host of ways. Crucially, a subject analysis cannot treat an NP as the cyclic subject of some V unless it is in fact understood in a way compatible with that analysis. Consider (24), for example:

(24) The men punished the dog for biting Sally.

Regardless of facts of Q floating, it is not possible to invent an analysis of (24) in which *the men* or a pronoun coreferential to *the men* is the cyclic subject of *biting*. This is precluded simply because of the semantics of the case, given minimal conditions on how grammatical structures are related to logical forms.[23] Therefore, if there

[22] Thus the derivation of (22) must be schematically:

(i) The gorillas$_m$ entered the cage and then all of them$_m$ quickly took baths $\xrightarrow{\text{Q Floating}}$

(ii) The gorillas$_m$ entered the cage and then they$_m$ quickly all took baths $\xrightarrow{\text{Deletion}}$

(iii) The gorillas entered the cage and then quickly all took baths.

[23] These conditions must block "interpretive rules" that could interpret (ia) as (ib), (iia) as (iib), or (iiia) as (iiib):

(i) a. The large elephant stepped on the small mouse.
b. 'The small elephant stepped on the large mouse.'

(ii) a. Tony giggled and Barbara screamed.
b. 'Tony screamed and Barbara giggled.'

(iii) a. Janet thinks that Sally is aggressive.
b. 'Sally thinks that Janet is aggressive.'

What is involved, evidently, is the claim that the relations of the maximally abstract grammatical structures are, along a variety of dimensions, isomorphic to logical structures.

existed examples like (25) in which *all* had floated from the subject of the main clause, they would clearly falsify a cyclic subject description of Q floating.

(25) *The men punished the dog for all biting Sally.

(There are no known examples of this type.) But a description that can be falsified is not empty. The possibility of abstract analyses, like that proposed for *convince*, thus in no way eliminates the empirical content of a cyclic subject account of Q floating.

Return then to a comparison of this analysis with the one proposed by LF. Despite their statement that "... there is no problem ..." in accounting for Q floating in their terms, I make the following claim:

(26) In every circumstance where their account makes a prediction that differs empirically from the one made by the cyclic subject account, it is wrong (and the latter is right).

Such cases have the following form:

(27) a. The conditions of LF's rule, that is, essentially, [X, NP, Y, VP] are met (moreover, what corresponds to the variable Y is null).
b. Q floating from an NP corresponding to the italicized element in (27a) is *not* permitted.
c. There is no sustainable analysis under which the correspondent of the italicized NP in (27a) is a cyclic subject of the V of what LF would regard as the VP.

More than a dozen different types of example with the logical structure of (27) are available:

(28) a. Jack promised all of the girls to attend the party.
b. *Jack promised the girls to all attend the party.

(29) a. Jack made vows to all those gods to reform.
b. *Jack made vows to those gods to all reform.

(30) a. He sang all of the songs to show he was versatile.
b. *He sang the songs to all show he was versatile.

(31) a. It would be unfair to all of them to flaunt your wealth.
b. *It would be unfair to them to all flaunt your wealth.

(32) a. Mary was forced by all of the soldiers to disrobe.
b. *Mary was forced by the soldiers to all disrobe.

(33) a. He seems to all of us to have contradicted himself.
b. *He seems to us to all have contradicted himself.

(34) a. I won all of those beads playing poker.
b. *I won those beads all playing poker.

(35) a. There is getting into all of those vaults to consider.
b. *There is getting into those vaults to all consider.

(36) a. Jack came home but for all those reasons went out again.
b. *Jack came home but for those reasons all went out again.

(37) a. Near each of the corpses lay a silver dagger.
b. *Near the corpses each lay a silver dagger.

(38) a. Who should I ask? All of those men, answered Sally.
b. Who should I ask? *Those men, all answered Sally.

(39) a. Hortense was too mean to all of her students to get a prize.
b. *Hortense was too mean to her students to all get a prize.

(40) a. That led Melvin, who hates all of those theories, to shoot himself.
b. *That led Melvin, who hates those theories, to all shoot himself.

(41) a. I have all of these papers to mark.
b. *I have these papers to all mark.

(42) a. It would be hard for any people knowing all those languages to fail.
b. *It would be hard for any people knowing those languages to all fail.

(43) a. Friends of all those girls were saved.
b. *Friends of those girls $\left\{\begin{matrix}\text{all were saved}\\ \text{were all saved}\end{matrix}\right\}$.

(44) a. It would be hard for some candidates for each of those offices to appear on TV.
b. *It would be hard for some candidates for those offices to each instantly appear on TV.

Consider the confirmatory relations between these facts and the two descriptions of English Q floating under consideration. In (28)–(44) each (a) example manifests a structure that meets the conditions of LF's rule. Therefore, *if* such structures are input to that rule, LF's account predicts the well-formedness of all of the (b) examples. In other words, their account would *explain* the well-formedness of these examples, if they were in fact well-formed. However, their uniform ill-formedness is a counter-example to such an account. Of course, this does not *demonstrate* or *prove* that LF's account is wrong,[24] but (28)–(44) do provide strong inductive counterevidence to

[24] In current grammatical writings there is widespread misuse of terms like these, whose core meanings and connotations suggest without basis the degree of certainty achieved in formal studies. LF engage in this on multiple occasions (1974, 538, 539, 548, 549, and other locations). There are other occurrences in the same issue of *Linguistic Inquiry*. Kaufman (1974, 512) claims that:

> The impossibility of a/yi-/prefix in (14) proves that these direct discourse sentential complements are not direct objects.

And Bresnan (1974, 616) states that:

their proposal. LF's treatment cannot explain the data just noted. The best that can be hoped for is to make it consistent with them. (I return to this below.)

On the contrary, the cyclic subject description predicts the ill-formedness of all of the (b) examples and is thus supported by the fact that they are ill-formed. It predicts this because in no case is the NP from which the Q was launched the cyclic subject of the V that becomes a sister of the Q (in fact, in no case is the NP any kind of subject of that V). The cyclic subject account would be falsified if a single genuine example of the (b) type in (28)–(44) were well-formed. Put differently, the cyclic subject description is not only consistent with the (b) examples of (28)–(44), it *explains* these facts.

(28)–(44) provide a clearer basis than can normally be found for choosing one linguistic description over another. However, as stated above, the facts do not provide anything like a proof of the falsehood of LF's description. It is worth considering why this is the case.

LF's rule is only falsified by the (b) examples of (28)–(44) *if* it is permitted to apply to structures of the form (28)–(44)(a). As LF themselves stress in (2) above, ". . . it would be difficult to prevent the processes from applying." One can, of course, attempt to show that the grammar in which their rule would be embedded contains features (independent of the rule itself) that prohibit this. In certain cases, there would no doubt be such features. For example, for (40b) and (42b), it can be argued that there are principles blocking the extraction of elements from relative clauses. Such principles predict the ill-formedness of (40b) and (42b), even for a grammar containing a rule like LF's. A claim of independent prohibition of operation is also plausible for (36)–(38). This could be argued as follows. Assume that Q Floating is cyclic. Assume that the deletion in (36) is cyclic or postcyclic and that the subject-reorderings in (37) and (38) are postcyclic. Then, at the point at which Q Floating applies, the conditions LF impose would not be met (with some generosity about

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Extraposed clauses are not dominated by NP. This can be proved in various ways. For example, Topicalization (which applies to NPs) does not apply to extraposed clauses: cf. *That you are right, I don't think is obvious; *That you are right I don't think it is obvious.*

Hopefully, these usages are only careless substitutions to avoid the stylistic repetition of phrases like *supports* or *gives some evidence for*. The so-called proofs or demonstrations invariably involve nothing but inductive arguments. For instance, if interpreted as a formal proof, Bresnan's account can be used to show that existential *there, someone, something*, etc., are not NPs, since these do not topicalize either.

(i) a. *There, I don't think are volcanos in Brooklyn.
b. *Something, I am sure he didn't eat.

In fact, such an interpretation could be used to show that every element that occurs as an NP also occurs as a non-NP. All that is necessary is to place the element in an island, which will block application of Topicalization:

(ii) a. That kind of soup, I can never digest.
b. *That kind of soup, he believes the claim that no one can digest.

These exaggerated uses of words like *prove* and *demonstrate* obscure how tenuously fact is related to theoretical conclusion, how difficult it is to disconfirm or support descriptive or theoretical proposals, and how easily even apparently well-supported analyses can collapse.

the interpretation of the variable Y in their rule). They could thus rightly argue that the overall grammar they would formulate would also predict the ill-formedness of the (b) examples of (36)–(38).

However, most of the cases in (28)–(44) do not seem susceptible to such treatments. (Cf. the appendix for the possible relevance of Chomsky's (1973) *specified subject condition* to this.) The recognition of special rule ordering statements for no other purpose than to prevent Q Floating from being applicable when it otherwise would be could hardly serve as a serious defense of a rule like LF's. In some cases, the needed orderings are not even possible. Consider (33). Suppose one tried to block (33b) with LF's rule by claiming that Q Floating is ordered *before* s-Raising. This would block (33b), given that s-Raising operates on structures of either of the forms (45a) or (45b):

(45) a. [(He contradicted himself) seems to all of us]
b. [It seems to all of us ((that) he contradicted himself)]

This ordering predicts, though, that s-Raising cannot feed Q Floating on the cycle on which the former applies. This has already been illustrated to be incorrect (cf. (19c)).

It might seem that one could block Q Floating in LF's terms in (33b) and several other cases by requiring that the NP that undergoes the rule *not* be the head of a prepositional phrase. This is impossible for two reasons. On theoretical grounds, the same kind of conditions excluding quantifiers from the structural descriptions of transformations, which motivate LF's rejection of a description in terms of subjecthood, would also block this description. Needed would be a rule of the form:

X, U, NP, Y, VP
1 2 3 4 5
where 2 ≠ P (or, maybe, where 2 + 3 ≠ PP)

But the condition involves implicit quantification. Moreover, even if such a condition could be stated, it would fail on empirical grounds. There are cases where, *in LF's terms*,[25] Q would have to float out of the heads of prepositional phrases; as examples, see orphan VP cases like (4) above and (46a–d) below:

(46) a. the tendency of all of those senators to vote in the same way
b. the tendency of those senators to all vote in the same way
c. He gave orders to all those orderlies to quit early.
d. He gave orders to those orderlies to all quit early.

[25] In the terms I would adopt, floating in (46b) would happen on the cycle of *vote* before the NP is raised on the next cycle, triggered by the element underlying *tendency* (cf. Postal (1974, 336–343)). In (46d), the floating would also take place on an early cycle before the source is lifted into the main clause by a verb raising operation. Prepositions would only appear postcyclically.

Thus even the combination of rule ordering and appeals to the difference between PP and NP does not aid LF's rule very much.

In many cases, it is hard to see any way in which LF's description can be made consistent with the facts. Consider (28). For them, (28a) has an underlying structure identical to or extremely close to its surface structure. They might treat the infinitive as an orphan VP (cf. the appendix for a different treatment involving a Pro subject and appeal to Chomsky's (1973) specified subject condition). Appeals to rule ordering, prepositions, intervening structures, etc., are irrelevant. Take also (43). Here all questions of intervening structures are irrelevant. There is no general prohibition, for language in general, or for English in particular, against extracting elements (to the right) from subjects. Thus, in French, *en* 'of it, them' can be extracted, and the same is true of various prepositional phrases in English:

(47) a. La préface n'en est pas flatteuse.
the preface of it is not flattering.
'The preface of it isn't flattering.'
b. Opposition to abortion has developed in Albania.
c. Opposition has developed in Albania to abortion.
d. All of them except Bob left yesterday.
e. All of them left yesterday except Bob.

Therefore, the fact that *all* in (43) cannot float is not accounted for in LF's terms. The analogous problem is noted for French Q floating from subjects by Kayne (1975, chapter 5, footnote 37):

> This suggests that some general condition on rules is at issue, presumably one that would also cover the intuitively similar restriction on Q-Post . . .: *La mère de ces garçons est tous partie.

Kayne is not able to suggest any condition. The requirement of subjecthood would, however, suffice for the Q case, since *tous ces garçons* is not any kind of subject in *La mère de tous ces garçons est partie* 'The mother of all these boys has left.'

Finally, consider (44). We *know* that on one reading, that in which *for some candidates . . . appear on TV* is not a constituent, LF would treat the infinitive as an orphan VP. It is not possible to claim that in general elements cannot be extracted from phrases like [(*a*) *candidate*(*s*) *for* ____], even though most animate NPs in English seem to be islands. These are not, however. Elements may be extracted from them either to the right or to the left:

(48) a. A candidate for that office has not yet come forward.
b. A candidate has not yet come forward for that office.
c. He interviewed all of the candidates for that office.
d. ?It is that office which he interviewed all of the candidates for.
e. It is that office for which he interviewed all of the candidates.

Thus no known general principle blocks extraction of elements in cases like (44). It remains unexplained, then, why LF's formulation of Q Floating, which pays no attention to grammatical relations, could not apply to yield (44b).

Suppose, however, that the previous paragraphs are overly pessimistic. Suppose ingenuity ultimately leads to the construction of a grammar containing LF's kind of Q Floating rule such that the rule never has a chance to apply to *any* structures like those in (28)–(44). Such a grammar would achieve consistency with these facts. But it would not have explained them. It would remain inferior to any description, like the cyclic subject account, which is not only consistent with the facts but also provides a principled basis for them. (The cyclic subject account is more principled than now appears, as we will see below.) A grammar that contained LF's rule and that was consistent with (28)–(44) (and all other possible cases of the form (27)) would in effect claim that the distribution of floating Q in English is miraculous. It would claim that, although nothing inherently guarantees this, it is, as a function of circumstances, accidentally true that floating Q can only originate in NPs that can be analyzed as cyclic subjects. Such a grammar, and LF's approach in general, could in principle not explain the fact that no one has been able to exhibit a case of floating Q of the sort in question[26] in which the Q cannot be described as being launched from a cyclic subject.[27]

[26] Of course, there are cases like (ia–c):

(i) a. I gave the children five dollars each.
b. To those men, I gave five dollars each.
c. He punched the old ladies three times each.

In these cases, as with Q Floating, a universal Q separates from its source NP. The source can be, but need not be, a cyclic subject. Such examples bear on the question of whether Q Floating involves reference to subjecthood only if they are a function of the same rule. But I deny that this process, called Each Shift in Postal (1974, 206–221), is to be equated with Q Floating. Nor is it reducible to the process, discussed in footnote 11, that reassigns head status within NPs, and brings about the postposing of Q.

Unlike the latter rule, Each Shift clearly brings about the separation of a universal Q from its source NP. Moreover, in my speech, the postposing operation does not function for *each*, while Each Shift works only for *each*.

There are other, hopefully more consistent, differences between Each Shift and Q Floating. As noted in Postal (1974), Each Shift is *governed*, that is, subject to constraints determined by the main verb defining the cycle on which it would apply. In particular, application with stative predicates seems blocked:

(ii) a. We {learned / *knew} two languages each.
b. We disconfirmed two theories each.
c. *Those facts disconfirmed two theories each.

Q Floating, on the other hand, is completely productive for cyclic subjects and quite ungoverned. Moreover, Each Shift is controlled not only by the nature of the verbal element, but also by the existence and nature of an indefinitely quantified NP toward which *each* is attracted:

(iii) I gave them {five dollars / *some money / *a lot of bread} each.

These differences show clearly, I think, that Each Shift and Q Floating are separate rules. If so, examples like (i) cannot bear on the issues of this article.

I should stress, though, that the formulation and nature of Each Shift are strongly affected by examples like those in (iv) of footnote 11, which, unfortunately, I have not been able to study since they lie outside of my dialect. Such examples *may* indicate that, for some speakers, Each Shift works with other Q besides *each*,

Let me sum up this excessively brief discussion of English Q floating and its relation to questions of linguistic theory. LF propose a rule for this phenomenon that is deliberately—as a consequence of their adherence to Chomsky's theory of TG that incorporates principle (1)—blind to grammatical relations (like "subject of"). Hence, it cannot distinguish cases in which the NP containing a Q is a (cyclic) subject of the relevant V from those in which it is not. This kind of blindness to grammatical relations[28] makes relatively precise claims. The degree to which these are false in the present instance is a partial measure of the importance of reference to subjecthood, which the framework advocated by Chomsky and LF precludes. The following conclusions inter alia seem warranted to me:

(49) a. The proper description of Q floating in English involves reference to the notion (cyclic) subject.
b. Hence, grammatical theory must countenance nonbase rules that are sensitive to grammatical relations.
c. Orphan VP analyses are in general incompatible with (49a) and must thus be rejected on this ground alone.
d. TG, as understood by Chomsky, LF, and others, is incompatible with (49b), thus with (49a), and so cannot be correct.[29]

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and that, in some cases at least, it attracts the Q not to the end of an NP but to its front. It is only in such dialects that one can study the question of whether an example like (iva) of footnote 11 (*He gave the boys all books*) is best analyzed as a case of NP internal head shift, such that *the boys all* is a derived constituent, or as a case of Each Shift, such that *all books* is a derived constituent. Or it may be that, in some dialects, such sentences have both analyses.

While I have distinguished Each Shift from Q Floating on factual grounds, it remains an open question whether there is any principled difference between them. I see at present only one line of description that would yield such a difference. On this view, Each Shift would be a rule that attracts a Q from one NP to another. Such rules are thus dependent on the existence of pairs of NPs. Q Floating, on the other hand, is independent of a second NP and makes the separated Q a clause constituent. Along these lines, one may be able to ultimately distinguish such rules in a principled way. Only Q Floating would be a QFR in the sense of (50a) in the text below.

[27] Since there are other phenomena parallel to Q floating, the viability of LF's proposal declines further. The dilemma provided by (28)–(44) is multiplied when one considers floating emphatic reflexive adverbial sequences such as *by X self*.

[28] The relevant property of transformations in his sense has been much emphasized by Chomsky in recent years. Cf. Chomsky (1971, 30–31), (1972, 118), (1973, 233).

[29] There is a way supporters of principle (1) can attempt to avoid this conclusion. Given that those who advocate such principles tend independently to appeal to "interpretive rules" under a wide range of circumstances and for varied purposes (cf. LF (1974, 555) for example), they may adopt such a position in this case as well. LF adopted a transformational description of floating Q, which is evidently not viable. It can be argued by such linguists that this was simply a descriptive mistake, without theoretical consequences. That is, it can be argued that their theory also permits a description of floating Q in terms of "interpretive" rules. Therefore, it will be claimed that (49a) does not disconfirm principle (1).

The proper reply to this at the moment is, I think, that it has no content. To claim that a certain phenomenon is to be described by an "interpretive rule" tells us nothing, since there is, to my knowledge, no published account that characterizes such rules in general terms. Evidently, unrestricted appeal to rules whose general form is not characterized will permit the maintenance of condition (1) on transformations simply because it can permit the maintenance of any condition at all. Note that an "interpretive rule" that can capture the generalization in (49a) must make reference to grammatical relations. Anyone who wants to propose

A fundamental aspect of Q floating has so far been ignored; that is, the discussion has been entirely internal to English. However, no surer method for guaranteeing misleading and language-bound descriptions has been found. Without viewing linguistic facts in the perspective of universal grammar, one is doomed to confuse accidental properties of rules with universal ones, to miss generalizations, to formulate as ad hoc restrictions properties that can be predicted, and to take as universal what are language-particular features. I have compared a description in which floating Q are described in terms of cyclic subjects with LF's, in which reference to grammatical relations plays no role. The former description, though far superior to the latter, is, as described so far, in turn inadequate. Its chief weakness is theoretical.

The evidence indicates that the rule requires reference to subjecthood. This is one of many indications that linguistic theory must permit postbase rules referring to grammatical relations. As such, however, this does not explain much about English Q floating. It leaves open the possibility that Q Floating *might* have been the kind of rule LF claim it to be. It fails to preclude the possibility that some language, even some dialect of English, might have a Q Floating rule in which there is no reference to such relations. However, such cases are so far unknown. One should therefore seek to construct grammatical theory so that reference to grammatical relations in Q Floating rules is not merely a possibility, but a necessity. A successful treatment of this sort would reveal in a more fundamental way the inadequacy of nonrelational proposals like LF's.

A more adequate account of Q floating integrated within universal grammatical theory might take the following form:

(50) It would:
- a. Define a notion of Q Floating Rule (QFR) in universal grammar.
- b. Specify at least three NP–V relations of the type subject, direct object, indirect object.
- c. State a law specifying that QFRs can only apply to NPs bearing relations of the type in (50b).

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an "interpretive" theory of floating Q as a way of saving principle (1) will have to show that in saving it he has not denuded it of empirical content.

I see no point in pursuing this until there is an actual proposal to deal with. It is worth noting, however, that in the earliest treatments of floating Q in transformational terms, grounds against an "interpretive" treatment were offered. Cf. Kayne (1969).

Moreover, if, as suggested in the text below, Q Floating falls into a formally definable set of rules of a certain type, a set including s-Raising, o-Raising, etc., then the claim that Q Floating is "interpretive" will sacrifice generalizations unless the former rules are "interpretive" as well. The difficulties inherent in such an attempt are well-known, since they are equivalent to the need to refute the arguments that have been offered for the existence of these rules.

Finally, Q Floating is only one minor case where grammatical rules must refer to grammatical relations. Others are even less susceptible to any treatment in terms of "interpretive" rules. For instance, recent work of Keenan and Comrie (1972) argues persuasively that extraction rules involved in relative clause formation are controlled by the relational hierarchy described in (50) below. In some languages, only subjects can be relativized; in others, only subject and direct objects, and so forth. How can "interpretive rules" save principle (1) from facts like these? Similar arguments hold for processes such as case marking and incorporation.

d. Specify further that the relations in (50b) are hierarchically organized (in the order there listed) and that applicability of QFRs is limited by the hierarchy. This is a special case of so-called Primacy, in the sense of Ross (1974), of Line Drawing in the sense of Perlmutter (personal communication), and of the accessibility hierarchy of Keenan and Comrie (1972). In other words, Q can float from subjects, from subjects and direct objects, or from subjects, direct objects, and indirect objects. But excluded are cases in which they float only from direct objects, or only from indirect objects, or only from both types of objects. Thus, what a language must ultimately do is specify the point in the hierarchy where floating is blocked. English blocks it at the highest point, after subjects. Japanese (S. Kuno, personal communication) permits it from subjects and direct objects. Still other languages, like French (Kayne (1975)) and German (Link (1972)), permit it from all three types of relational terms.

Perlmutter and Postal (to appear) argue that an account like that in (50) is well-motivated and not inconsistent with the known cross-linguistic evidence about Q floating.

In fact, it is argued that an even stronger theory than (50) is possible. Principle (50c) can be taken as a theorem of a generalization governing a larger class of rules, including s-Raising and o-Raising. Roughly, this class involves those rules that form new terms of grammatical relations by "promoting" NPs that are parts of more inclusive relation-bearing NPs. This view rejects the transformational description of Q floating. The latter takes this process to involve essentially the breaking off and repositioning[30] of a piece of an NP, perhaps with some concomitant deletion. In the "promotion" view, such rules involve the formation of new subjects, objects, etc., through the replacement of the containing NP, NP_L in footnote 12, by an NP that is a subpart, NP_a in footnote 12. The "promotion" view is consistent with the facts of subject-verb agreement in cases like (51a–c):

(51) a. Each (one) of the gorillas $\left\{\begin{matrix}\text{is}\\ \text{*are}\end{matrix}\right\}$ upset about a different issue.

b. The gorillas each $\left\{\begin{matrix}\text{*is}\\ \text{are}\end{matrix}\right\}$ upset about a different issue.

c. The gorillas $\left\{\begin{matrix}\text{*is}\\ \text{are}\end{matrix}\right\}$ each upset about a different issue.

Such a contrast in agreement is automatic if Q Floating is a rule that makes *the gorillas* the new subject (since agreement is sensitive to cyclic subjects). That is, the

[30] Every account of Q floating in transformational terms known to me has had this form. These include independent treatments by Kayne (1969, 1975) and Fauconnier (1971, 1973, 1974) for French, and Dougherty (1970) and various unpublished and published (1974, 111) accounts by Postal for English.

main verb, *be*, would have the NP *each (one) of the gorillas* as cyclic subject in (51a), but the NP *the gorillas* as cyclic subject in (51b,c).

While the "promotion" account predicts the verb agreement facts in a way that the transformational account cannot, it is *not* fully consistent with the earlier description of the role of cyclic subjects in Q Floating. Previously, I stated that in a configuration like that in footnote 12, NP_L had to be the cyclic subject of V_t. Given the promotion account, however, this cannot be the case, since NP_L becomes a subject on the cycle determined by V_t. Thus, in (51b), *the gorillas* is the cyclic subject of *are*, while *each (one) of the gorillas* corresponds to NP_L. A minor revision suffices, however. One need only say that it is NP_a that must be the cyclic subject of V_t.[31]

Appendix

In arguing above that it would be difficult even to make LF's account consistent with the data in (28)–(44), I did not deal with the possibility that the so-called *specified subject condition* (henceforth: SSC) suggested by Chomsky (1973) might come to the aid of a rule that itself makes no reference to subjecthood. Since LF (1974, 555) in fact appeal to this principle, this is not a possibility that should be overlooked.

[31] The requirement that NP_a be the cyclic subject imposes an ordering between Q Floating and all rules that create derived subjects. It specifies that there is no well-formed derivation in which any of the latter follow Q Floating on a cycle.

Actually, as S. Peters reminds me, the above ordering comment is only strictly true in the case of floating away from subjects. Floating from subjects must follow all subject-creating rules. However, nothing in what has been stated about Q floating prohibits a case where a Q floats from an object NP, which then becomes a subject. That is, nothing precludes a derivation of the following schematic form:

(i) a. Frank wrote $_{NP}$[all of the songs]$_{NP}$ $\xrightarrow{\text{Q Floating}}$
b. Frank wrote $_{NP}$[the songs]$_{NP}$ all $\xrightarrow{\text{Passive}}$
c. The songs were all written by Frank.

For, in this case too, NP_a of footnote 12 becomes the cyclic subject of the verb determining the cycle on which floating occurred. Whether this type of derivation actually exists should, I think, be regarded as an open question.

The type of ordering discussed at the beginning of this footnote is entirely distinct from the extrinsic rule ordering permitted in transformational description. The latter could achieve the effect of the cyclic subject statement only by extrinsic rule ordering statements specifying that Q Floating follows all subject-creating rules, that is, through a list of special grammatical rules of the form (ii):

(ii) a. Q Floating follows Passive (stated in effect in Dougherty (1970, 879))
b. Q Floating follows s-Raising
c. Q Floating follows Extraposition
etc.

Reference to cyclic subject involves a generalization that no list like (ii) can express. The generalization is that Q Floating will follow *all rules that create derived subjects*. Such an account thus makes predictions as to what will happen if a new subject-creating rule is added to the language. A weak and uninteresting list like (ii) is necessarily mute about such a case.

In transformational terms, moreover, it would be equally possible to have, instead of (ii), a "mixed" list in which Q Floating preceded some subject-creating rules but followed others.

LF's rule is vague with respect to ordering. That is one reason why certain possibilities for preventing application had to be discussed in the text, with respect to (28)–(44). It goes without saying that in adopting an ordering like that in (ii), as they must, supporters of LF's account cannot *explain* why all subject-creating rules have the same ordering with respect to Q Floating. This is another respect in which such an account is explanatorily inferior to one that makes direct reference to grammatical relations.

If the SSC were a valid universal principle, or even a principle holding for English, it could in fact suffice to block the application of the rule that LF suggest in at least the cases (28b), (29b), (30b), (31b), (32b), (33b), (34b), (35b), (36b), (39b), and (41b). Thus, the SSC would go a long way toward keeping LF's account consistent with the data.

Chomsky (1973) states the SSC as follows:

(52) *SSC* = relevant part of Chomsky's (123)
No rule can involve X, Y (X superior to Y) in the structure
$\ldots X \ldots [_{\alpha} \ldots Z \ldots -WYV \ldots] \ldots$
where (i) Z is the subject of WYV and is not controlled by a category containing X.

Roughly, "X is superior to Y" means that X is in a higher part of a tree than Y.[32] To say that one thing is controlled by another means essentially that there is coreference between them, and, typically, that the controlled element deletes.

To see the possible relevance of the SSC to the present discussion, let us consider (28) above, which I repeat as (53):

(53) a. Jack promised all of the girls to attend the party.
b. *Jack promised the girls to all attend the party.

The SSC could be invoked to explain this as follows. Assume that the underlying structure of (53a) is (54):

(54) Jack promised all of the girls [Pro to attend the party]
... X Z WYV

Thus Pro, which functions as Z in Chomsky's schema, is the subject of the phrase *to attend the party*, *all* is the element X, which functions in the rule, and Y is the position to which X will be moved. However, the movement will be blocked since Pro is a subject of WYV and is not controlled by a category containing X. Rather, it is controlled by the subject of *promise*, *Jack*. Thus, in these terms, (53) contrasts with (55):

(55) a. Jack told all of the girls to attend the party.
b. Jack told the girls to all attend the party.

This would have the structure (56):

(56) Jack told all of the girls [Pro to attend the party]

In (56), unlike (54), Pro is controlled by the NP that dominates *all* (the object of *told*), not by *Jack*. Thus this Pro does not function as a specified subject and a rule like LF's would not be blocked.

[32] More precisely, "X is superior to Y" means that every major category dominating X dominates Y as well but not conversely. Major categories in these terms are S, NP, VP, AP, etc.

The reader can easily check that this sort of analysis gives the appearance of being able as well to block the other cases listed above. Thus, contrary to what I asserted earlier, it may seem that most of the counterexamples to LF's rule are eliminated by appeal to the SSC. For this to be so, the SSC must be a sustainable principle. Instead, however, the range of counterexamples is large in size and varied in nature, even for English.

A number of such counterexamples were given in Postal (1974, 62–69). To my knowledge, they have never been answered. I will briefly review them and then turn attention to other counterexamples. Since there is a lot of material to cover, I will give the data in a formalized way. Counterexamples will be marked with respect to their role in Chomsky's schema (cf. (52)) as follows: Underneath the portion corresponding to *X*, I will write X; underneath the portion corresponding to the specified subject, I will write S; and underneath the portion corresponding to *Y*, I will write Y. Thus the general form of the counterexamples will be (57),

(57) $\underset{X}{[}\quad\underset{S}{[}\quad\underset{Y}{]}\quad]$

where in (57) a rule connecting X and Y has operated, even though a specified subject occurs in the position where this is claimed by the SSC to block all rules. All of the examples will meet the "X superior to Y" condition. Note that the formula "No rule can involve . . ." is meant to include both "syntactic" and "semantic" rules and is specifically applied by Chomsky to both transformational and "interpretive" operations. For our purposes here, it is thus irrelevant whether, for example, a certain rule is a deletion, or an "interpretation" of some dummy element. Both would be blocked under the appropriate conditions if the SSC were valid.

First, the cases from Postal (1974).

(58) *Picture Noun Reflexivization*
Mike will not believe that this is a picture of himself.
X S Y

(59) *Conjoined Agent Reflexivization*
I told Tom that the entries should be designed by Ann and himself.
X S Y

(60) *Like-phrase Reflexivization*
I told Albert that no one would suspect physicists like himself.
X S Y

(61) *(A)symmetrical Predicate Reflexivization*
Mary found Melvin (to be) similar to herself (in that respect).
X S Y

In all of these cases, the reflexivization operations in question operate across specified subjects with no resulting ungrammaticality. These previously attested cases already gravely undermine the SSC.

Consider now some additional cases from English.

(62) *Super-Equi (NP Deletion)*

Melvin feared that that would be like Pro torturing himself.

X S Y

(63) *Purpose Deletion*[33]

A slave girl must appear for you to entertain yourself with Pro

X S Y

Significantly, Object Deletion, the very rule LF devote much of their discussion to, and apropos of which they invoke the SSC, is a counterexample, because of cases like (64):

(64) *Object Deletion*

Martha is too important for us to arrange for Sam to date Pro

X S Y

If, as I believe and contrary to what LF claim, *Tough* Movement is *not* reducible to Object Deletion, then this is an independent counterexample:[34]

(65) Tough *Movement*

The president will be difficult for me to arrange for you to see.

X S Y

Not only are the cases so far enumerated counterexamples to the SSC as stated, they do not lend themselves to any reformulation of this principle. The reason is that the typical phenomena that the SSC was intended to block are in fact blocked

[33] If the *for* clause in (63) could be argued to be an extraposed relative from the head *a slave girl*, then (63) would not be an independent counterexample. I rather doubt that a relative clause analysis can be justified. (63) seems to me no worse when a proper NP like *Portia* is substituted for *a slave girl*. But proper NPs normally only take appositive relatives, and these are not known to extrapose.

[34] Examples based on the verb *take* provide counterexamples that may or may not fall under the Object Deletion/*Tough* Movement categories:

(i) The president will take a long time for me to arrange for you to see Pro

X S Y

in these environments. A reformulation ensuring that the "specified subjects" in these cases somehow were not really specified subjects would at best properly allow the existing examples here. But it would then fail to block others that the principle was explicitly designed to account for. A major motivation for the SSC was to account for the ungrammaticality of certain sentences in which a "specified subject" intervenes between *each other* and its antecedent. Saying that the environments in (58)–(65) are exceptions to the SSC would then predict that sentences with *each other* in these environments *will be grammatical*. The ungrammaticality of the starred examples in (66) shows this prediction to be incorrect:

(66) a. *We will not believe that these are pictures of each other.
b. *We told Tom that the entries should be designed by Ann and each other.
c. *We told Albert that no one would suspect physicists like each other.
d. We feared that that would be like torturing each other.
e. *Slave girls must appear for you to entertain yourself with each other.
f. *They are too nice for me to play that kind of trick on each other.
g. *The officers will be difficult for me to arrange for him to see each other.

(67) and (68) provide still further counterexamples involving coreferential deletion (or, possibly, raising):

(67) We avoided Bill's $\left\{\begin{matrix}\text{grasp}\\ \text{wrath}\end{matrix}\right\}$ Pro ⇓ ϕ (due to J. Ross)

X S Y

(68) That proposal deserves our immediate study Pro ⇓ ϕ

X S Y

So far, almost all of the invalidating examples have involved processes based on coreference, that is, deletion or reflexive marking. However, (52) is not at all limited to predictions about this class of rules and thus can be disconfirmed on the basis of many other sorts of operations.

Consider, then, some different types of counterexamples. Klima (1964) noted that sentences such as (69a) have a reading on which the negative is a "sentence negation", having higher scope than *will force*. Hence (69a) shares a reading with (69b).

(69) a. I will force you to marry no one.
b. I won't force you to marry anyone.

The "sentence negation" origin of *no* in (69a) was argued for by Klima (1964, 285) not only on the basis of the meaning but also on the basis of the possibility of a tag with *neither*, not compatible with lower scope negatives:

(70) a. I will force you to marry no one and neither will Ted.
b. I will approve his eating nothing (*and neither will Ted).

Klima handled such facts by allowing his rule, Neg Incorporation into Indefinites, to work into (some) complements. As observed to me by J. Ross, this rule (or an interpretive reformulation interpreting *no* as having higher scope than *force*) violates the SSC, as shown by (71):

(71) I will force you Pro to marry no one.
X S Y

Here I have placed the X in the normal position for a "sentence negation" in the main clause.

Moreover, whatever kind of operation links a controlled *any* to its trigger is unaffected by specified subjects and thus provides a further counterexample:

(72) a. *I believe that Bill likes anyone.
b. I doubt that Bill likes anyone.
X S Y

Further, Ross points out that the deletion operations in comparatives yield SSC violations. First, there is the type illustrated in (73):

(73) He is more intelligent than I thought he was M
⇓
ϕ
X S S X

Then there is the more radical or additional deletion illustrated in (74):

(74) He is just as foolish as I had feared M
⇓
ϕ
X S Y

Sequence of tense rules offer a further violation of the SSC:

(75) a. I am afraid that Melvin $\left\{\begin{matrix}\text{will}\\ \text{*would}\end{matrix}\right\}$ lose.
b. I was afraid that Melvin $\left\{\begin{matrix}\text{*will}\\ \text{would}\end{matrix}\right\}$ lose.
X S Y

A similar counterexample is provided by the process that yields untensed verbs in the *that* complements of some predicates:

(76) a. I knew that he $\left\{\begin{matrix}\text{was}\\ *\text{be}\end{matrix}\right\}$ hung.

b. I demanded that he $\left\{\begin{matrix}*\text{was}\\ \text{be}\end{matrix}\right\}$ hung.

X S Y

The most obvious sources for counterexamples to the SSC are the unbounded movement rules such as Topicalization, Adverb Preposing, and *Wh* Movement, which can extract elements from complements and quite freely across subjects. Chomsky (1973) attempts to eliminate this conflict by proposing that such rules all extract in stages, moving elements only into Comp constituents, which are situated at the beginning of clauses. Thus, in the derivation of (77a), which appears to violate the SSC, the operation of Topicalization is assumed to occur in stages, as in (77b).

(77) a. Melvin, I just know that Sheila will never visit.

X S S Y

b. $[_{S_2}$Comp I just know $[_{S_1}$ Comp Sheila will never visit Melvin $]_{S_1}]_{S_2}$

Thus, when the rules are operating on the S_1 cycle, *Melvin* will move into the Comp node of S_1, not violating the SSC, and similarly when the S_2 cycle is under consideration.

However, this approach to unbounded movements can at best save the SSC against examples like (77a) only if the following condition holds:

(78) The set of extractions performed by Topicalization, *Wh* Movement, etc., as a group is such that there are *no cases* in which more than one element is extracted from the same complement clause.

(78) must hold if Chomsky's cyclic theory of "unbounded" movement rules is to work because such a theory entails (78). If more than one element could be extracted from a single clause, represented by S_n in some tree, they would both have to move into the Comp of S_n on the S_n cycle. But there is only room in Comp for one item, a fact that Chomsky uses (1973; cf. the discussion there after his (35)) to provide explanations for certain nonexistent examples, like those in which more than one *wh*-phrase is extracted from the same clause.

However, (78) is incorrect, as shown by such examples as (79a,b):

(79) a. *Under those conditions*, *what* do you think I should do?

b. If he comes, what do you think I ought to do?

In (79a), for example, both of the italicized phrases have been extracted from the complement of *think*. This is shown not only by the way they are understood, but

also by the fact that they are incompatible with parallel elements occurring in that clause:

(80) *Under those conditions what do you think I should do (that) (under these conditions)?

Since (78) does not hold, Chomsky's method of saving the SSC from unbounded extractions like those produced by Topicalization fails. Therefore, at present, all such rules generate derivations inconsistent with the SSC.

I have made no effort to make an exhaustive list of the counterexamples to the SSC that can be found in English. Those already available leave no doubt, I think, that no such constraint holds for English. This is, of course, sufficient to show that no such principle is an element of universal grammar. But it is of some interest to provide a few counterexamples from other languages, to at least sketch the scope of the overall failure of the SSC to constrain the operation of grammatical processes in the world's languages.

Turning to French, the conditions determining subjunctive marking of verbs in certain complements are a violation:

(81) a. Je sais que Pierre { vient / *vienne }.
'I know that Pierre is coming.'

b. Je veux que Pierre { *vient / vienne }.
'I want that Pierre comes.'
X S Y

That is, complements of *vouloir* (but not *savoir*) require the subjunctive. Second, for some speakers, there is a rule raising quantifiers out of a restricted class of complements (apparently subjunctives). Thus, in addition to (82), in which the quantifier *tous* is, as expected, in its complement, Kayne (1975) observes that some speakers also permit (83):

(82) Il faut que Jean les lise tous.
it necessary that Jean them read all
'John has to read all of them.'

(83) Il faut tous que Jean les lise.
X S Y

Here, the quantifier has been lifted into the main clause, across the specified subject *Jean*. For discussion of this phenomenon, cf. Kayne (1975, chapter 1, section II).

In Japanese, reflexivization, surfacing as the element *zibun*, functions into complement clauses across specified subjects. Consider the example from McCawley (1972, 4):

(84) Satoo$_i$ wa Tanaka$_j$ ga Hara$_k$ ga zibun$_{i,j,k}$ no ie de koros-rare-ta
self 's house in kill-passive-past
koto o Nakamura ni hanasite simatta no o sitta
that to had talked that found out
'Satoo$_i$ found out that Tanaka$_j$ had already told Nakamura that Hara$_k$ was killed in self$_{i,j,k}$'s house.'

The subscripts represent coreference and indicate that *zibun* is ambiguously coreferential. In the case of the readings marked by *i* and *j*, the connection is established across intervening subjects. Schematically:

(85) Satoo$_i$ [Tanaka$_j$ [Hara$_k$ in self's house killed] Nakamura told] found out
X S S Y
X S Y

D. Perlmutter informs me that a similar phenomenon is found in Russian.

In Vietnamese, as pointed out to me by D. Johnson, the rule analogous to English Equi can also delete direct objects. Truitner (1972, 372) gives the following example that violates the SSC:

(86) Kim múôn John dánh Pro
⇓
Kim wanted John hit ϕ
'Kim wanted John to hit her (Kim).'
X S Y

In Finnish, the object of a verb is normally in the accusative or the nominative, depending on conditions discussed at length in Timberlake (1975). However, there is an overriding rule, operative in certain environments, including sentence negation, which places the object in the partitive. This rule operates into (some) subordinate clauses and does not care whether or not these have specified subjects. Thus the following sentence from Timberlake (1975, 224) is a counterexample to the SSC:

(87) en sanonut hänen suorittaneen työta
neg I say he (genitive) performed task (partitive)
X S Y
'I say him to have performed the task.'

A number of other languages have processes analogous to Finnish partitive marking.

The Finnish rule determining the choice of nominative vs. accusative for objects also violates the SSC. The use of the nominative can be determined in subordinate clauses by, for example, whether the main clause in which they are embedded is imperative or not. The following examples from Ross (1967, 331–332) illustrate this phenomenon:

(88) Minä koetin pyytää pojan tuomaan
I am trying to ask the boy (accusative) to bring
kirjan.
the book (accusative)

(89) Koeta pyytää poika tuomaan kirja.
Try to ask the boy (nominative) to bring the book (nominative)

The nominative marking of *kirja* in (89), determined by the imperative *koeta*, violates the SSC because the verb *bring* would have a Pro subject, coreferential with *poika* 'boy', and thus a specified subject with respect to *koeta*. Again, processes similar to Finnish nominative marking of objects are found in other languages, e.g. Estonian. Cf. Timberlake (1975).

We see that counterexamples to the SSC are readily available in the existing literature on languages other than English. These combine with the cases from English to support the conclusion that the SSC is an artifact, rather than a genuine principle of language or even a genuine principle of English grammar.

Since there is no SSC, this principle cannot be invoked in cases like (53) above to explain the failure of application of LF's rule of Q Floating in environments where the structural description of the rule itself would not block application. More generally, the SSC can in no way alleviate the serious clash between LF's rule and the actual distribution of floating Q in English. Thus the SSC, ignored in the text of this article, can have no bearing on its conclusions.

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Some Issues in the Theory of Transformations*

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1. Theoretical and Methodological Preliminaries

The specification of formal criteria[1] delimiting the class of possible transformations is of fundamental importance in linguistic theory. *Ceteris paribus*, if the notion transformation is narrowly defined, the class of possible grammars is thereby reduced. By restricting the class of grammars in empirically justifiable ways, we approach an explanation for the ability of human beings to acquire language. Postal (1975) argues that the theoretical framework we were assuming[2] in Lasnik and Fiengo (1974) imposes overly restrictive formal criteria. Since such an argument implies that the class of possible grammars must be increased, the burden of proof clearly rests on its proponent. We maintain that Postal has failed in this task.

We will first outline the relevant aspects of the theory of transformations which we are assuming. We presuppose Chomsky's[3] definition of "phrase marker".

> Suppose that $D_1, \ldots, D_n$ constitute a maximal set of equivalent [phrase structure] derivations[4] of a terminal string S. Then we define a *phrase marker* of S as the set of

* We wish to thank Noam Chomsky, who showed us how to look at things.

[1] We use the term "formal criteria" for conditions specifying the class of possible grammars, as against "conditions on applicability", which determine the class of derivations, given a particular grammar. The A-over-A condition, for example, is a condition of the latter type.

[2] Basically, that which was developed in Chomsky (1955).

[3] Cf. Chomsky (1956).

[4] Two phrase structure derivations are equivalent if and only if they differ only in the order in which the rules are applied. It should be noted that a minor extension in this account of P-marker is required. As Chomsky (1961) has noted:

> Since transformational rules must re-apply to transforms, it follows that the result of applying a transformation must again be a P-marker, the *derived* P-marker of the terminal string resulting from the transformation. A grammatical transformation, then, is a mapping of P-markers into P-markers.