

THE COMPARATIVE

1. No idea is older in the history of linguistics than the thought that there is, somehow hidden underneath the surface of sentences, a form or a structure which provides a semantic analysis and lays bare their logical structure. In Plato's *Cratylus* the theory was proposed, deriving from Heraclitus' theory of explanatory underlying structure in physical nature, that words contain within themselves bits of syntactic structure giving their meanings. The Stoics held the same view and maintained moreover that every sentence has an underlying logical structure, which for them was the Aristotelian subject-predicate form. They even proposed transformational processes to derive the surface from the deep structure. The idea of a semantically analytic logical form underlying the sentences of every language kept reappearing in various guises at various times. Quite recently it re-emerged under the name of generative semantics.

This paper was written to support the theory that for every sentence its ultimate underlying structure, which is input to the grammar and is often called its deep structure, is what we want to regard as its semantic representation and has logical form. By logical form is meant the form which is required for any kind of formal logical argument. We are still far from knowing what the logical form of sentences exactly looks like. The assumption is that there is such a form: this has been the central assumption for the development of any branch or kind of logic. Although little is known about the semantic representations *cum* logical form *cum* deep structure of sentences, there is evidence that some such analysis is required as is found in predicate calculus. That is, we need quantificational structures in order to account for certain grammatical observations.

The point has been made by McCawley. In (1967) p.41 he gives as an example:

- (1) Those men saw themselves in the mirror.

which is ambiguous as between:<sup>1</sup>

<sup>1</sup> McCawley uses an unusual formalism to represent (2) and (3), involving 'restricted quantification', i.e., quantifiers over variables plus their domain. The reasons given for this are considerations of existential presupposition. I am not sure that this notation helps to overcome the problems connected with existential presupposition, but it is perhaps more convenient

- (2) For each man there was an event in which he saw himself in the mirror.

and:

- (3) There was a single event in which each of the men saw all of the men in the mirror.

We may give another example:

- (4) Planes are safer now than thirty years ago.

which is ambiguous as between the following two approximate readings:

- (5) For every plane there is an extent to which it is safe now but was not thirty years ago.

and:

- (6) There is an extent such that every plane is safe to that extent now but thirty years ago every plane was not safe to that extent.

The readings (5) and (6) are still far removed from what an adequate deep structure analysis will be. But it is clear that any adequate disambiguation requires at least the quantifying phrase 'there is an extent' or the like, which can occur in different positions, and some distinction between two groups of planes at different times for reading (6). If one proposes to analyze (4) as, for example:

- (7) Planes are safe to an extent to which they were not thirty years ago.

the ambiguity remains.<sup>2</sup>

**2.** Existing transformational accounts of comparative constructions do not do justice to the grammatical regularities that can be observed in connection with them. Among these accounts I reckon the following to be most prominent: Lees (1961), Smith (1961), Pilch (1965), Chomsky (1965, pp. 177-84), Huddleston (1967), Doherty and Schwartz (1967). All these treatments have one feature in common: in some form or other they take the comparative itself to be a primitive in the transformational component,

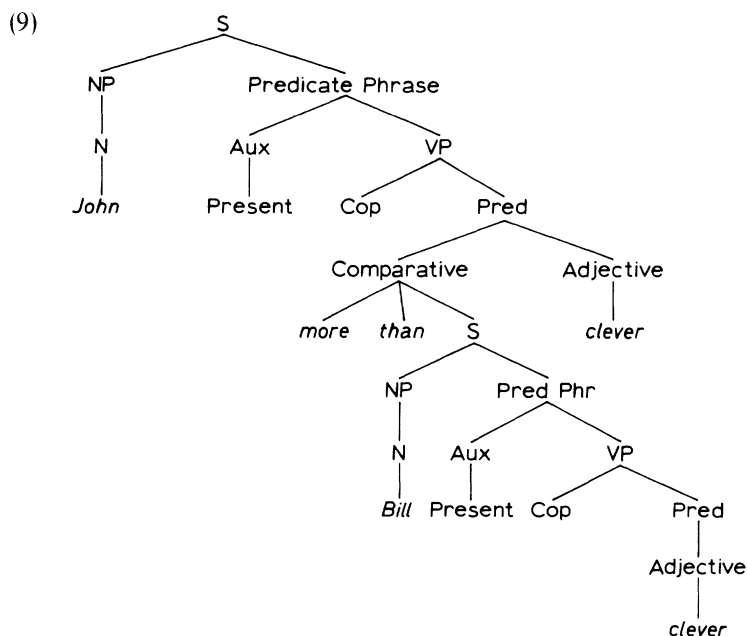
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for the universal quantifier than the customary notation 'for all  $x$ , if  $x$  is a man, then ...'. The important thing here, however, is that the ambiguity of (1) can only be made explicit with the help of quantifiers and variables, whether in some symbolic notation or in formalized English.  
<sup>2</sup> It is to be noted that ambiguity arguments were among the earliest to be used, by Chomsky and others, for postulating underlying structures.

i.e., an unanalyzed deep structure term (in earlier treatments even with a different meaning). Chomsky, for example, gives for:

(8) John is more clever than Bill.

the following underlying deep structure (1965, p. 178; I leave out details which are irrelevant for the present discussion):



Although there are important differences between the linguistic analyses of the comparative found in the literature mentioned above, and the ways the logicians usually deal with it, they have in common that 'comparative' is taken as a primitive notion, not open to further analysis. Comparatives are described by logicians as transitive relations, and no further problems seem to arise. (See, for example, Russell (1940, pp. 64–5), Strawson (1952, pp. 202–3), Reichenbach (1947, pp. 251–3, 315–6).) I shall argue that, from the point of view of grammar, the comparative cannot be adequately described as a primitive. As a corollary it will follow that it must not be considered a primitive in logic either, but the logical aspects will receive no further attention.

Jespersen (1917, p. 80), relying on his acute feeling for grammatical analysis, intuited the presence of a negation element in comparatives. This idea was made explicit by Ross (1968, p. 294):

Notice first that words like *any* and *ever* may occur in *than*-clauses:

- (10) He solves problems faster than any of my friends ever could.

But these words occur characteristically in negative sentences (and in questions and *if*-clauses), and are excluded in affirmative sentences:<sup>3</sup>

- (11) (a) \*Any of my friends could ever solve those problems.  
 (b) Could any of my friends ever solve those problems?  
 (c) At no time could any of my friends ever solve those problems.  
 (d) If any of my friends ever solve those problems, I'll buy you a drink.

Notice furthermore that negative elements cannot occur in *than*-clauses:

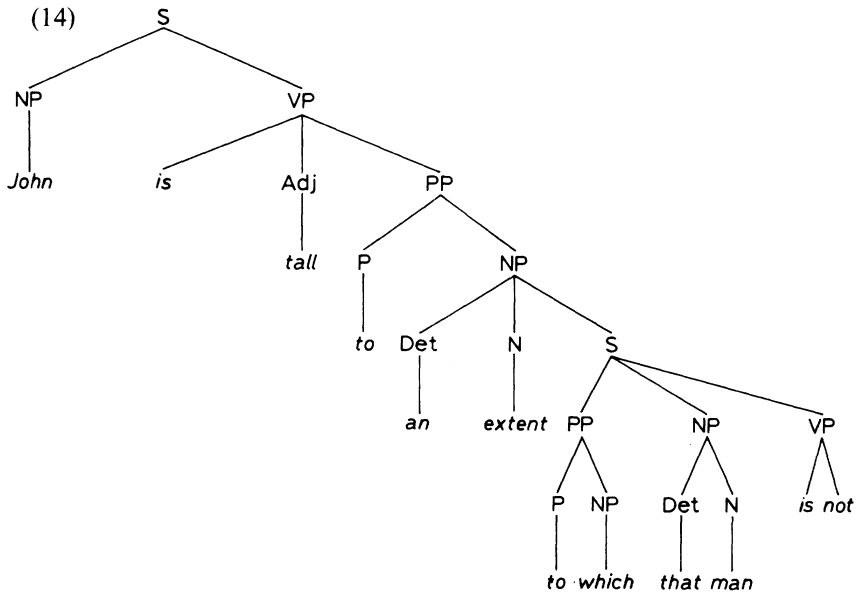
- (12) (a) \*He is taller than nobody here.  
 (b) \*Bill ran faster than I couldn't.

These two facts strongly suggest that a negative element is present in the structure which underlies the *than*-clause.

He then proceeds to propose for:

- (13) John is taller than that man (is).

as 'quite a plausible deep structure' the following:



<sup>3</sup> There are, perhaps, grounds for analyzing *yes/no* questions as 'I question whether or not', and *if p* as 'or not *p*' (with *(then) q* for '(or *p* and) *q*'; *then* would thus be a pronoun-type replacement of a proposition). If these analyses are correct, the negation element provides the generalization for the occurrence of *any* and *ever*. Obviously, these problems cannot be gone into here.

Ross's examples have been renumbered in accordance with their occurrence in the present text.

(14) would also underly:

(15) John is tall to an extent to which that man is not.

which is synonymous with (13).

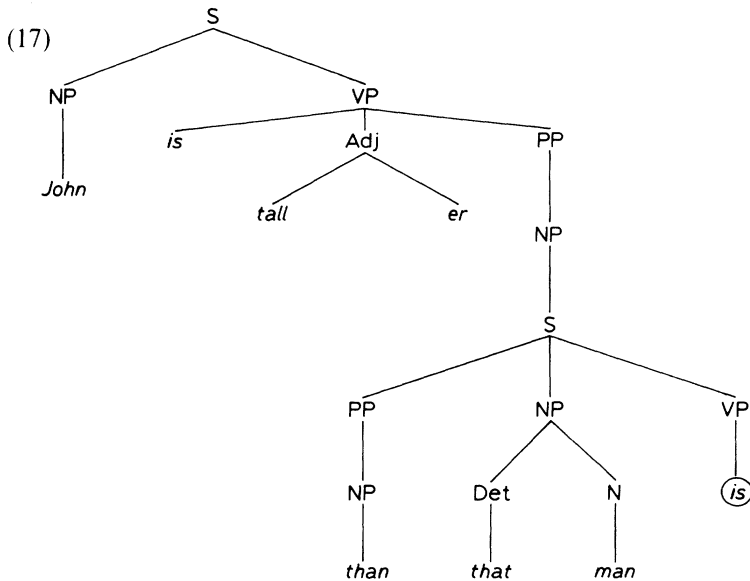
The following rule for 'comparative introduction' is then proposed (p. 295):

(16) *Comparative Introduction:*

$$X - \begin{cases} \text{Adj} \\ \text{Adv} \end{cases} - \text{to an extent to} - \text{which} - Y - \text{not} - Z$$

1	2	3	4	5	6	7	⇒ (optional)
1	2 + er	0	than	5	0	7	

turning (14) into:



A further optional rule may then delete the circled node *is*, and consequently the vacuous VP above it.

Ross does not go into further details, the comparative not being his main concern in that paper.

3. Let us investigate the merits of (14) as an (not necessarily, *the*) underlying structure for (13). We can give further arguments for the assumption of a

negation element in the *than*-clause.<sup>4</sup> There are certain grammatical features in English, whose occurrence is bound up with negation, and others that will not allow for negation. Baker lists some of them (1970, pp. 169–70). I partly draw on this material. He gives *already*, *rather*, *just as well*, *pretty* (as a degree adverb), *far* (with comparative), *still*, which preclude (or are peculiar with) sentence negation:

- (18) \*I haven't already eaten too much.
- (19) \*I wouldn't rather be at home.
- (20) \*I mightn't just as well take the train.
- (21) \*He didn't do pretty well on the exam.
- (22) \*He isn't far taller than his uncle.
- (23) \*John doesn't still play golf.

Now consider the following pairs:

- (24) (a) You have already got less support than he has.  
(b) \*He has got more support than you already have.
- (25) (a) I would rather carry less than he does.  
(b) \*He carries more than I would rather do.
- (26) (a) I could just as well eat a bit more than you do.  
(b) \*You eat a bit less than I could just as well do.
- (27) (a) I would pretty much like to run faster than Bill.  
(b) \*Bill runs slower than I would pretty much like to.
- (28) (a) He would be far better off with less money than he has.  
(b) \*He has more money than he would be far better off with.
- (29) (a) John still wants to buy more books than he can afford.  
(b) \*John can afford less books than he still wants to buy.

We see that the grammatical features that show positive polarity do not occur in the *than*-clause.

Conversely, 'negative polarity' features do occur in *than*-clauses, although no overt negation element is present. We have already seen *any* and *ever*. But there are many more. Baker mentions as 'negative polarity' items *much* (\*He said much.), *be all that* (\*The colonel is all that bright.), *bother V-ing* (\*Bob will bother leaving a number.), *lift a finger* (\*George has lifted a finger lately.), *care to VP* (\*I care to go.). We may add *be bothered V-ing* (\*I can be

<sup>4</sup> Ross gave some of the evidence presented below in an unpublished paper 'The Deep Structure of Comparatives', read at The First and Last Annual Harvard Spring Semantics Festival, May 16, 1969. I rely on the handout.

*bothered doing that.*), *far* (\**We got far.*), *need* + infinitive (\**You need leave.*), *can possibly* (\**You can possibly mean that.*), *the slightest* (\**I had the slightest intention of leaving.*), *budge* (\**He would budge.*), *can help* (\**I could help sneezing.*), *can stand/bear* (\**I can stand/bear the sound of her voice.*), *at all* (\**That is good at all.*), and there are no doubt others. All these 'negative polarity' items can occur in *than*-clauses:

- (30) (a) The emperor was more inclined to amuse himself than to do *much* for his country.  
 (b) \*The emperor was more inclined to do *much* for his country than to amuse himself.
- (31) That amount of spaghetti was more than I *was all that* keen to eat.
- (32) (a) That's more than he will *bother* thinking of.  
 (b) That stuff was more than I could *be bothered* reading.
- (33) (a) John's laziness was stronger than his willingness to *lift a finger*.  
 (b) \*John's willingness to *lift a finger* was stronger than his laziness.
- (34) The fifth glass was more than I *cared to* drink.
- (35) I've solved lots of more difficult problems than he has got very *far* in even understanding.
- (36) John runs faster than he *need* run.
- (37) He was a greater bore than I *could possibly* put up with.
- (38) He went further than I had *the slightest* intention of going.
- (39) Given their characters, it is much easier for Bill to give in gracefully than for John to even *budge*.
- (40) My urge to steal was stronger than I *could help*.
- (41) The sound of her voice was more than I *could stand/bear*.
- (42) This is more serious than I would have believed *at all* possible.

This is strong evidence in favour of the assumption that there is a negation element in the underlying structure of comparatives. There is, however, also independent evidence in favour of this assumption. Joly (1967) observes that in a great many dialects of English *nor* is used instead of *than*:

- (43) He is richer *nor* you'll ever be.

If *nor* is analyzed as 'and not', and if we take the relative clause in (14) further

back to *and*-conjunction – as we will do – this *nor* has a perfectly legitimate source in deep structure.

Joly furthermore provides Old-English  $\bar{p}$  *on-ne* as the etymology for *than*, which means ‘by which not’ (neuter pronominal relative in the instrumental case, followed by the negation element). *Than* would thus correspond directly, in Old-English, to a derivational stage such as given in (14).

We can, moreover, provide a natural explanation for the so-called ‘*ne explétif*’ in French comparatives. There, the negative particle *ne* is obligatory in a *than*-clause if this clause contains a finite verb form:

- (44) Jean est plus grand que je ne pensais.  
(John is taller than I thought).

According to some, French *que* is derived from Vulgar Latin *quid*, which is derived from Latin *quo*, meaning ‘by which’. The negation element has not been incorporated into the comparative particle, and crops up again under certain conditions. The same phenomenon is observed in Italian, where *non* + subjunctive is used in formal style:

- (45) Giovanni è più alto che non pensassi.

Colloquial Italian prefers:

- (46) Giovanni è più alto che pensavo.

Certain dialects of English, such as Cockney, have a negation-copying transformation, whereby the negative element is repeated for every following quantifying element:

- (47) He has never been no good to no woman, not never.

Cockney also allows for the following:

- (48) She did a better job than what I never thought she would.

The negation in *never* can be explained with the same negation-copying transformation, if we accept an underlying negation element in comparatives.

So far we can accept Ross’s analysis. The assumption of an *extent*-phrase seems to be justifiable in the light of the so-called positive and negative connotations of gradable adjectives. Any grammar of English will have to explain the positive connotation in, e.g.:

- (49) John is tall.

and the negative connotation in, e.g.:

- (50) (a) John is short.



- (b) How short is John?
- (c) John is not so short as Bill.
- (d) John is that short.

It will have to explain the absence of either a positive or a negative connotation in, e.g.:

- (51) (a) How tall is John?
- (b) John is taller than Bill.
- (c) John is shorter than Bill.
- (d) The baby is too tall for the pram.
- (e) John is too short for the basket-ball team.
- (f) John is six feet tall.

It will have to explain the ungrammaticality of:

- (52) \*John is five feet short.

and the ambiguity of:

- (53) (a) John is that tall.
- (b) John is not so tall as Bill.

No satisfactory analysis of these and similar data has been given so far in the literature. And no attempt will be made to give one here. But it is not unreasonable to expect that any adequate analysis will require an *extent*-phrase for all occurrences of gradable adjectives. Adverbials such as *how*, *so*, *that*, *-er than*, *six feet*, *too* can reasonably be expected to be derived from an underlying *extent*-phrase. Evidence for this expectation is that sentences such as (49) or (50a), which lack an overt *extent*-phrase, always have either a positive or a negative connotation, which could presumably be derived from an underlying general (i.e., recoverable) form of comparative, for example, 'more than one would expect'.

On the basis of the examples given in (49)–(53) we can distinguish between *neutral* gradables, which take a positive connotation when used without overt *extent*-phrase, and optionally in cases such as (53), and *negative* gradables, which are negatively marked when no overt *extent*-phrase occurs and in cases such as (50b–d). This distinction is further motivated by the fact that negative, but not neutral, gradables allow for 'negative polarity' items to occur with them:

- (54) (a) It is difficult to ever get a straight answer from him.
- (b) \*It is easy to ever get a straight answer from him.

- (55) (a) It was unjust to ever start that war.  
(b) \*It was just to ever start that war.
- (56) (a) It was impossible for him to lift a finger.  
(b) \*It was possible for him to lift a finger.

We can even use this test to decide which of a pair of opposites is the negative one in cases where this is not immediately evident:

- (57) (a) It was nasty of him to think that I could do that at all.  
(b) \*It was nice of him to think that I could do that at all.
- (58) (a) He is far from being prepared to admit that he has ever been wrong.  
(b) \*He is close to being prepared to admit that he has ever been wrong.

It would go beyond the limits of this study, however, to explore the problems of positive and negative connotation any further here.

4. Ross's analysis, as given in (14), needs the obvious amendment that the predicate *tall* must be repeated in the structure underlying the *than*-clause, since we have, e.g.:

- (59) John is taller than that corridor is long.

where *long* cannot be deleted due to non-identity with *tall* in the main clause. That is, we clearly have to do with two sentences, or rather propositions. Parts of the second are deletable under certain identity conditions. In this respect Chomsky's analysis as given in (9) is correct.

A more serious objection, however, results from the ambiguity of (4) noted in Section 1. *Planes are safer now than thirty years ago*. As was pointed out there, there seems to be no other way to disambiguate this sentence than by introducing scope-bearing quantifiers. Predicate calculus provides a natural way of doing so:

- (60) (a)  $\forall x$   $\exists e$  (now  $x$  is safe to  $e$  & not 30 years ago  $x$  was safe to  $e$ )  
 $x$  is a plane
- (b)  $\exists e$  (now  $\forall x$  ( $x$  is safe to  $e$ ) & not 30 years ago  $\forall y$  ( $y$  was safe to  $e$ ))  
 $x$  is a plane  $y$  is a plane

( $e$  is a variable ranging over extents; I use McCawley's notation of writing class inclusion below quantifiers – see note 1; a different treatment is suggested below).

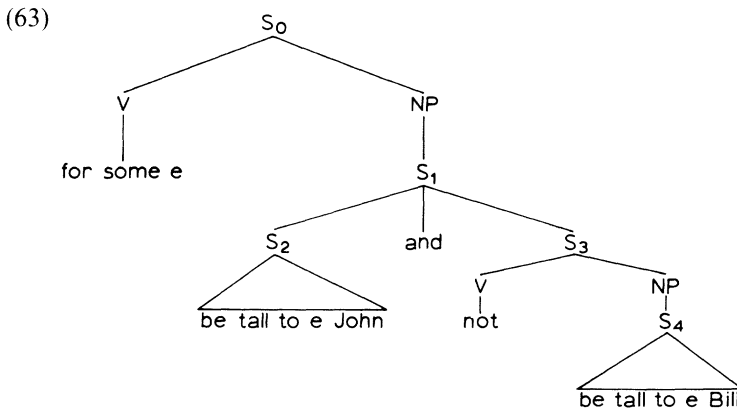
In Ross's analysis, which corresponds to (7), the ambiguity is not resolved. The simple comparative:

(61) John is taller than Bill.

can now be represented as:

(62)  $\exists e$  (John is tall to  $e$  & not Bill is tall to  $e$ )<sup>5</sup>

or, more completely, as:<sup>6</sup>



We can formulate the following tentative set of cyclical rules to transform structures like (63) into those like (61), or their near (shallow) equivalents (they apply in the order in which they are given):

- (64)
- (a) *And-Deletion*
  - (b) *Operator Incorporation*
  - (c) *some/any rule*
  - (d) *Subject-Verb Inversion*
  - (e) *more than rule*

These rules have roughly the following characteristics:

(a) *And-Deletion*: The name has been chosen because of the similarity with ordinary *and-Reduction*, though not with further transposition rules which are typical of conjunction reduction. What is deleted must have an

<sup>5</sup> This analysis was proposed in Seuren (1969), p. 129.

<sup>6</sup> I disregard tense, as far as possible. I follow McCawley in letting the subject follow the verb (McCawley, 1970).

identical counterpart in the first clause. There are some further, more superficial, restrictions on *and*-Deletion in the comparative. Thus, for example, if the predicate nominal remains undeleted, then the copula must remain so too, together with a pronominalized form of the subject (except if the subject is an original *S*):

- (65) (a) John is heavier than *he* is fat.  
 (b) \*John is heavier than fat.<sup>7</sup>  
 (c) The door is wider than is necessary.  
 (d) \*The door is wider than it is necessary.

(b) Operator Incorporation: (This is sometimes called ‘Quantifier Lowering’). An operator is any predicate with an embedded *S* as its subject-NP. The embedded *S* is raised to replace the dominating *S*. The dominating predicate is incorporated into the original embedded *S* as one of its constituents. (There are a number of constraints, some of which probably universal, governing this process. For quantifiers and negation see Lakoff (1970)).

(c) *Some/any* rule: This rule converts *some* into *any* (*some time* into *ever*), when, after (b), *not* precedes *some*.<sup>8</sup>

(d) Subject-Verb Inversion: This rule is discussed in McCawley (1970). It turns VSO into SVO.

<sup>7</sup> (65b) is ungrammatical, at least in British English. We have, of course, *John is more heavy than fat*. Note, however, that there is compulsory stress on *heavy* and *fat* here. There is also a semantic difference between (65a) and this sentence: the former presupposes a relation between exact measurements; the latter speaks about the greater or lesser adequacy of the expressions *John is heavy* and *John is fat*. It seems that the sentence quoted here is a case of contrastive stress. To deal with such cases satisfactorily would clearly go beyond the limits of this paper. Generally, many particular problems related with comparatives are left out of account here. Only such cases are discussed as might provide counterevidence to the analysis proposed here.

<sup>8</sup> As formulated in this way, this rule is too wide in at least two different ways. First, it should apply only to cases of *some* which derive from an existential quantifier: \**This isn't anything I would like you to do*. Secondly, there are some curious exceptions. Assuming that there is a negation element in questions and *if*-clauses (see note 3), it is still strange that we cannot say:

- (1) \*Did he say anything again?  
 (2) \*Did he REALLY say anything?  
 (3) \*Is it true that he said anything?  
 (4) \*It wasn't very polite of you to say anything like that.  
 (5) \*He did NOT say anything.

Especially the predicate ‘be true that’ seems to block *any*. It is overt in (3), and may be taken to underly (2) and (5). Robin Lakoff (1969) raises some interesting questions regarding this rule. In most cases where *some* occurs in *if*-clauses, questions, or even after plain negation, the higher verb ‘be true that’ seems to have been deleted. Compare:

- If you see somebody, you must tell me.  
 If you see anybody, you must tell me.  
 If it is true that you see somebody, you must tell me.  
 \*If it is true that you see anybody, you must tell me.

(e) *More than* rule:

$$(66) \quad \text{Adj} - \text{to some } e - X - \text{and} - Y - \text{not} - Z \Rightarrow \\ \text{more} - \text{Adj} - X - \text{than} - Y - Z$$

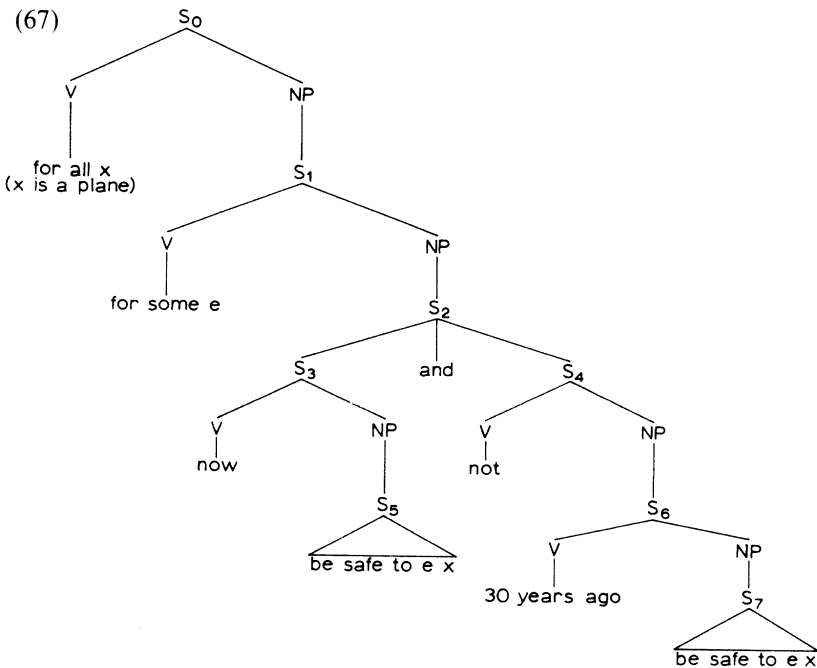
where  $e$  ranges over extents,  $X$  may be null, and either  $Y$  or  $Z$ , but not both, may be null.

Under certain phonological conditions a further rule applies, converting (stressed) *more + Adj* into *Adj + er*.

If applied to (63) the rules of (64) make for the following derivation:

- $S_4$  – SV-Inversion – Bill be tall to  $e$
  - $S_3$  – Op-Incorporation – Bill not be tall to  $e$
  - $S_2$  – SV-Inversion – John be tall to  $e$
  - $S_1$  – *And-Deletion* – John be tall to  $e$  and Bill not
  - $S_0$  – Op-Incorporation – John be tall to some  $e$  and Bill not
- *more than* – John be taller than Bill.

(60a) corresponds to the following tree:

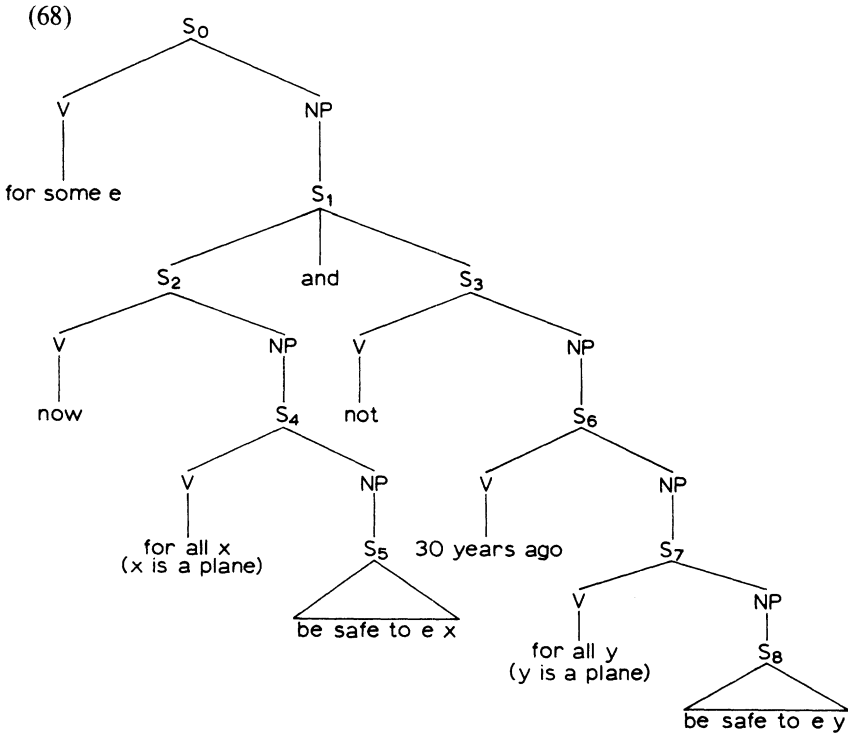


The rules will yield the following derivation:

- $S_7$  – SV-Inversion –  $x$  be safe to  $e$

- S<sub>6</sub> – Op-Inc. – 30 years ago *x* be safe to *e*
- S<sub>4</sub> – Op-Inc. – 30 years ago *x* not be safe to *e*
- S<sub>5</sub> – SV-Inversion – *x* be safe to *e*
- S<sub>3</sub> – Op-Inc. – *x* be safe to *e* now
- S<sub>2</sub> – And-Deletion – *x* be safe to *e* now and 30 years ago not
- S<sub>1</sub> – Op-Inc. – *x* be safe to some *e* now and 30 years ago not
- *More than* – *x* be safer now than 30 years ago
- S<sub>0</sub> – Op-Inc. – all planes be safer now than 30 years ago.

(60b) has the following tree plus derivation:



- S<sub>8</sub> – SV-Inversion – *y* be safe to *e*
- S<sub>7</sub> – Op-Inc. – all planes be safe to *e*
- S<sub>6</sub> – Op-Inc. – 30 years ago all planes be safe to *e*
- S<sub>3</sub> – Op-Inc. – 30 years ago not all planes be safe to *e*
- S<sub>5</sub> – SV-Inversion – *x* be safe to *e*
- S<sub>4</sub> – Op-Inc. – all planes be safe to *e*
- S<sub>2</sub> – Op-Inc. – all planes be safe to *e* now
- S<sub>1</sub> – And-Deletion – all planes be safe to *e* now and 30 years ago not

- $S_0$  – Op-Inc –                    all planes be safe to some  $e$  now and 30 years ago not  
 – *More than* –                    all planes be safer now than 30 years ago.

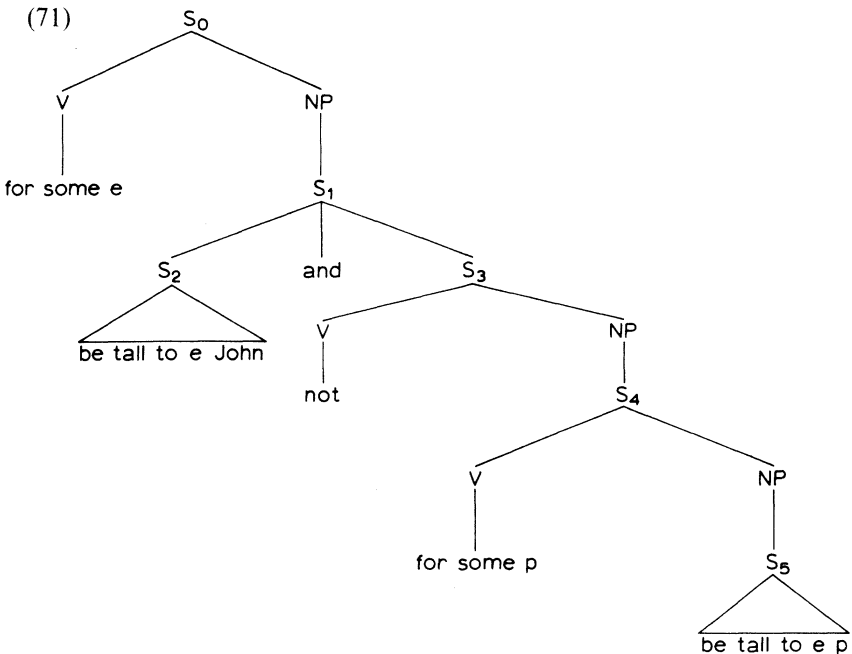
For:

(69) John is taller than anybody.

the semantic representation will at least have the following structure:

(70)  $\exists e$  (John is tall to  $e$  & not  $\exists p$  ( $p$  is tall to  $e$ )) (where ' $p$ ' ranges over persons)

or:



The derivation is:

- |                               |  |
|-------------------------------|--|
| $S_5$ – SV-Inversion –        | $p$ be tall to $e$                       |
| $S_4$ – Op-Inc. –             | some $p$ be tall to $e$                  |
| $S_3$ – Op-Inc. –             | not some $p$ be tall to $e$              |
| – <i>Some/any</i> –           | not any $p$ be tall to $e$               |
| $S_2$ – SV-Inversion –        | John be tall to $e$                      |
| $S_1$ – <i>And-Deletion</i> – | John be tall to $e$ and not any $p$      |
| $S_0$ – Op-Inc. –             | John be tall to some $e$ and not any $p$ |
| – <i>More than</i> –          | John be taller than any $p$ .            |

The cyclic character of the *some/any* rule prevents problems for negative comparatives, such as:

(72) John is not taller than Bill.

Here the uppermost *not* does not affect 'for some *e*', since the comparative treatment is completed before this *not* is incorporated: there is no *some* to be converted into *any* or to determine the position of *not*.

5. Let us now turn to a type of comparative discussed by Chomsky in *Aspects* (pp. 180, 234):

(73) John is a more clever man than Bill.

(74) I know several more successful lawyers than Bill.

In (73) it is understood that Bill is a man: we cannot replace *Bill* by *Mary*. In (74), on one reading, it is understood that Bill is a lawyer. On this reading (74) is equivalent to:

(75) I know several more successful lawyers than Bill is.

On another reading it is equivalent to:

(76) I know several more successful lawyers than Bill does.

(Note that (75) is bracketed as: *several (more successful)*, but (76) as: *(several more) successful*. That is, *several* quantifies *lawyers* in (75), but in (76) it indicates how many more lawyers that are successful I know than Bill does. This point will be discussed in Section 6).

This ambiguity disappears in:

(77) I know several lawyers more successful than Bill.

But in (77) it is no longer necessary to understand that Bill is a lawyer. Likewise, to take another example of Chomsky's (*Aspects*, p.234), we cannot say:

(78) I have never seen a heavier book than this rock.

or, if we do, we must interpret *this rock* as referring to some kind of book. But there is no difficulty in:

(79) I have never seen a book heavier than this rock.

There is no difficulty in (77) or (79). The comparative there is contained within a restrictive relative clause dependent on *lawyers* and *book* respectively. But there is a problem in (73), (74) and (78).



Let us consider (73). From the conditions on (64a), *And-Deletion*, it follows that (73) must be derived from:

(80) John is a more clever man than Bill is a clever man.

or, rather, from:

(81)  $\exists e$  (John is a clever to  $e$  man & not Bill is a clever to  $e$  man)

Let us assume there to be an optional rule, which can be called *Noun Raising*, which has the following effect:

the  $x$  ( $x$  is a house) is red  $\Rightarrow$  the  $x$  is a red house

More generally and precisely:

(82) be – Adj – the  $x$  ( $x$  be Indef N) –  $X$   $\Rightarrow$  be – Indef – Adj – N – the  $x$  –  $X$

where ‘ $x$ ’ ranges over variables, ‘Adj’ over adjectives including gradables plus their *extent*-phrases, ‘N’ over nouns, ‘Indef’ over underlying indefinite determiners ( $a$  or null);  $X$  may be null.

This rule is cyclic and precedes (64a).

(81) can thus be further reduced to:

(83)  $\exists e$  (the  $x$  ( $x$  is a man & John is  $x$ ) is clever to  $e$  & not the  $y$  ( $y$  is a man & Bill is  $y$ ) is clever to  $e$ )

Let us assume a further optional rule, to be called *Relative Raising*, of essentially the following form:

(84) be – NP – the  $x$  (...  $x$  ...)  $\rightarrow$  ... NP ... (‘ $x$ ’ is a variable ranging over variables)

(*NP*, being the predicate nominal, receives stress or focus of intonation. It keeps the stress all through the transformational treatment. This would imply that certain aspects of sentence intonation go back to very deep structure. Such aspects seem to override more superficial accentual rules: see, for example, note 10. We have to refrain, however, from going into problems of intonation more deeply here).

Relative Raising is cyclic and applies after Noun Raising but before (64a). Noun Raising finds support in the fact that in certain contexts expressions such as *It is a red house.* are preferred to *The house is red.* The evidence for Relative Raising is more plentiful and stronger. This rule accounts, in principle, for the meaning and the contrastive stress in, e.g.:

(85) JOHN did not write the letter (PETER did).

which can be derived from:

(86) not (be John the *x* (wrote *x* the letter))

By Relative Raising this will be transformed into:

(87) not (wrote JOHN the letter)

and hence into (85).<sup>9</sup>

Relative Raising accounts for the stress on *whom* in, e.g.:

(88) To whom did you write the letter?

which is to be derived from:

(89) be who the *x* (wrote you the letter to *x*)

Relative Raising turns this into:

(90) wrote you the letter to WHO

*Wh*-movement will then move the *who* to the front and, with all the necessary trimmings, the result will be (88).<sup>10</sup>

Strong evidence for Relative Raising comes from Tacitus, *Annals* 12.36:

(91) Avebantque visere quis ille tot per annos opes nostras sprevisset.

The story is about Caratacus, the Britannic freedom fighter, who had been captured, after many years, by the Romans and was exhibited to the public in Rome. The sentence means: 'And they wanted to come and see who that man was who had scorned our power for so many years.' Literally, however, it says: 'And they wanted to come and see who that (man) had scorned our power for so many years.' The evidence consists in the word *ille* (demonstrative pronoun nominative singular masculine): had this not been present in the text, the sentence would not have been peculiar in any way. As it stands, however, it is strongly marked, stylistically: it is 'typical Tacitean'. Let us derive (91), roughly, from:

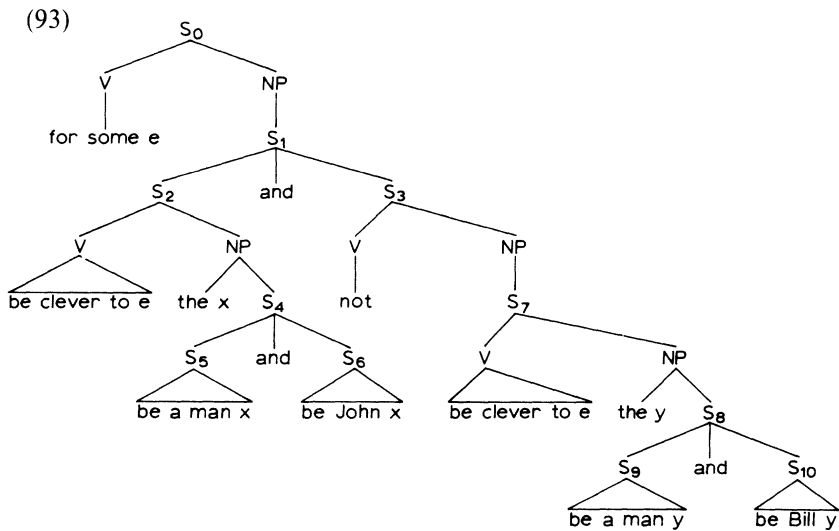
<sup>9</sup> Another possible derivation is to extrapose (*wrote x the letter*), so that we get: *not (the x be John (x wrote the letter))*, after SV-Inversion; this will then become: *It was not John who wrote the letter*. The derivation with Relative Raising seems to lead to difficulties in those cases where the stressed element is not an NP. These difficulties are only apparent, however, and can be solved by taking the stressed elements as quoted: quoted elements are always NP's.

<sup>10</sup> The stress on interrogative pronouns and adverbs seems to be universal. In Ancient Greek these words always have a rising tone on the first mora. If there is only one mora the rising tone is word final. There is a phonological rule in Ancient Greek which converts all word-final rising tones into flat tones before a single word boundary, but not in sentence-final position, or at the end of a major syntactic constituent. Interrogative pronouns and adverbs, however, do not obey this rule: those that have final rising tone keep it under all conditions, thereby overriding the general accentual rules of the language.

- (92) Avebantque visere (erat quis ille x (x tot per annos opes nostras spreverat))

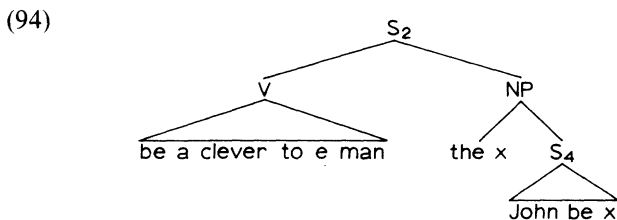
Supposing that Relative Raising is the same in Latin as it is in English, it would, strictly speaking, not apply, since the demonstrative pronoun *ille* stands in the position of the weaker definite article (which has no overt expression in Latin). Yet Tacitus, in his quest for brevity, forced the rule to apply and left *ille* as a remnant of the underlying structure. In spite of this irregularity the sentence is, strangely enough, immediately interpretable.

Let us now apply the rules to (83), or rather to its corresponding tree:



SV-Inversion operates on  $S_5$ ,  $S_6$ ,  $S_9$  and  $S_{10}$ .

I take *be* + NP as verb.  $S_5$  and  $S_9$  now become *x be a man* and *y be a man*, respectively. I assume furthermore (but this is a matter of slight importance in the present context) that SV-Inversion operates on the predicate nominal when this is a definite NP or a proper name.  $S_6$  and  $S_{10}$  will then become *John be x* and *Bill be y*, respectively. This blocks any form of *and*-Reduction on  $S_4$  or  $S_8$ .  $S_2$  and  $S_7$  now undergo Noun Raising.  $S_2$  becomes:



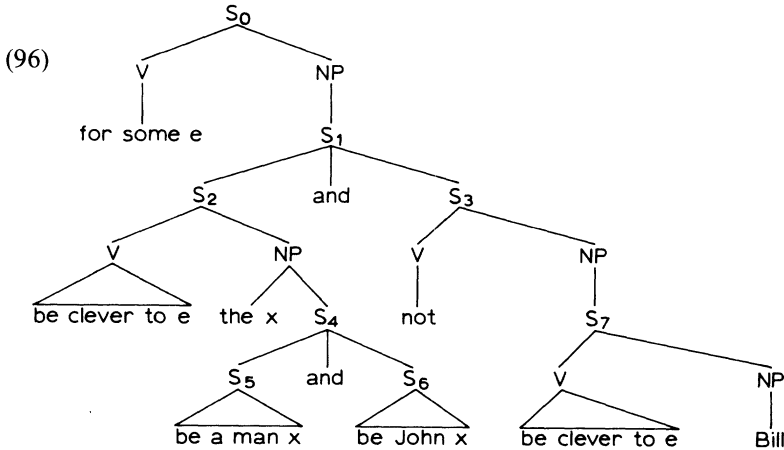
For  $S_7$  the result is analogous, with  $y$  and *Bill* for  $x$  and *John* respectively.

Now Relative Raising applies to  $S_2$  and  $S_7$ , yielding *John be a clever to e man* and *Bill be a clever to e man*.  $S_1$  and  $S_0$  undergo the standard treatment and the result is something near (73).

It must now be shown that (73) cannot be derived from, e.g.:

- (95)  $\exists e$  (the  $x$  ( $x$  is a man & John is  $x$ ) is clever to  $e$  & not Bill is clever to  $e$ )

or:



$S_2$  will become, as in the derivation of (93): *John be a clever to e man*.  $S_3$ , however, will be: *Bill not be clever to e*. Now *and*-Deletion does not apply to  $S_1$ , and (73) cannot be the output of (96). This explains why (73) cannot mean what (95) says. It does not explain what is wrong with:

- (97) \*John is a more clever man than Bill is clever.

which is the expected output of the rules operating on (96). Instead we would wish to derive:

- (98) John is a man who is more clever than Bill.

Noun Raising and Relative Raising are both optional rules, and they are certainly not the only ones to deal with such structures as  $S_2$  in (96). It may well be possible to develop  $S_2$  into: *John is a man who is clever to e*. The deepest rules concerning noun phrases, adjectives and copula are still so unclear that any further elaboration here would rapidly develop into mere speculation. What does seem likely, however, is that there is some derivational constraint on *and*-Deletion in the comparative. The constraint would be such that a choice must be made among the available rules that

maximum similarity is ensured of the two S's of the comparative *and*-conjunction. I shall not try to formulate this constraint more precisely here, but we will have occasion to refer to it more than once below.

6. Let us now consider the two sentences:

- (99) John bought an older car than Bill (did).  
 (100) John bought an older car than that Ford (is).<sup>11</sup>

There is an interesting difference between these two sentences. In (100) the indefinite article represents genuine quantification, but in (99) it does not. This appears from the fact that we can say:

- (101) John bought many older cars than that Ford (is).  
 (102) John never bought any older car than that Ford (is).

but not:

- (103) \*John bought many older cars than Bill (did).  
 (104) \*John never bought any older car than Bill (did).

We can say, however:

- (105) John bought older cars than Bill (did).

The same distinction between grammatical and ungrammatical as holds between (99) and (105) on the one hand, and (103) and (104) on the other, is observed in:

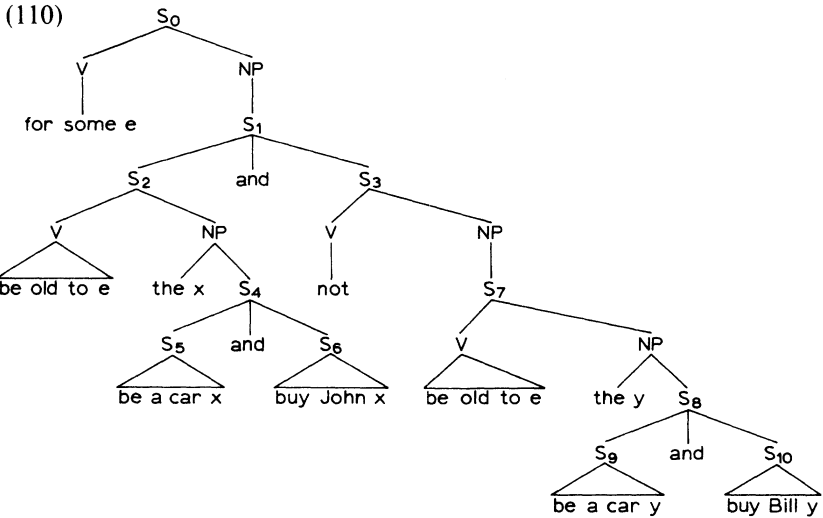
- (106) What John bought was an older car than what Bill bought.  
 (107) What John bought was older cars than what Bill bought.  
 (108) \*What John bought was many older cars than what Bill bought.  
 (109) \*What John bought was never any older car than what Bill bought.

In (99) and (106), which are synonymous, it is presupposed, or implied, that Bill bought a car. (99) has the same structure as (73), which was discussed in Section 5. In fact, with the rules given so far we can derive both (99) and (106) in a way parallel to the derivation proposed for (73). Let us take as input structure (110). (99) is derived in the following way:

- S<sub>5</sub> – SV-Inversion – x be a car  
 S<sub>6</sub> – SV-Inversion – John buy x  
 S<sub>9</sub> – SV-Inversion – y be a car  
 S<sub>10</sub> – SV-Inversion – Bill buy y

<sup>11</sup> These examples are more suitable for this discussion than Chomsky's ambiguous (74). In fact, (99) and (100) correspond to the readings (76) and (75), respectively, of (74).

- S<sub>7</sub> – Noun Raising – be an old to *e* car the *y* (Bill buy *y*)
- Relative Raising – Bill buy an old to *e* car
- S<sub>3</sub> – Op-Inc. – Bill not buy an old to *e* car
- S<sub>2</sub> – as S<sub>7</sub>– John buy and old to *e* car
- S<sub>1</sub> – *and*-Deletion – John buy an old to *e* car and Bill not
- S<sub>0</sub> – Op-Inc. – John buy an old to some *e* car and Bill not
- *more than* – John buy an older car than Bill.



(106) is derived by not applying Relative Raising to S<sub>7</sub> and S<sub>2</sub>. After Noun Raising S<sub>7</sub> will then become, by SV-Inversion:

the *y* (Bill buy *y*) be an old to *e* car

*Not* will subsequently be inserted before *be*. Similarly, S<sub>2</sub> will become:

the *x* (John buy *x*) be an old to *e* car

*And*-Deletion on S<sub>1</sub> will yield:

the *x* (John buy *x*) be an old to *e* car and the *y* (Bill buy *y*) not

Somewhere in the process the parts *the x* (*John buy x*) and *the y* (*Bill buy y*) will be converted into *what John buy* and *what Bill buy*, respectively. The *more-than* rule and further trimming will give (106). The same treatment can be given to (105) and (107). One notices again, as at the end of Section 5, that there is a tendency, if not a constraint, to ensure that there is maximum similarity between the two S's of the comparative *and*-conjunction.

It is clear from this analysis that the indefinite article in (99) and the null article in (105) do not represent quantification. What they represent is the indefinite article or determiner in the predicate 'be a . . .', which is a relation of class inclusion.

Let us now consider sentence (100). This sentence poses a new problem, for which only a tentative solution can be offered here. The sentence:

(111) John bought a car.

can be derived from:

(112) the  $x$  (John bought  $x$ ) is a car.

by Relative Raising. This derivation is the proper one if *car* carries stress. On this interpretation the indefinite article does not represent quantification. If *car* is not stressed, however, we have to do with quantification.

The semantic representation can then be taken to be something corresponding to:

(113)  $\exists x$  (John bought  $x$  &  $x$  is a car)<sup>12</sup>

We now assume as a principle that before Operator Incorporation can operate, the variable which is quantified by the operator must be made to occur only once within the brackets. In some cases Conjunction Reduction is a way of doing this. (In fact, *and*-Deletion was given above as preceding Operator Incorporation). In this case, however, Conjunction Reduction does not apply. But we can let another process apply, *Relativization*. This converts (113) into:

(114)  $\exists x$  (John bought  $x$ , which is a car)

By Operator Incorporation this now becomes:

(115) John bought an  $x$ , which is a car.

Let us assume a further rule, *NP-Reduction*, of roughly the following form:

(116) Determiner –  $x$  – wh – be – Indef – NP  $\Rightarrow$  Determiner – NP  
where ' $x$ ' ranges over variables.<sup>13,14</sup>

<sup>12</sup> It should be understood that there is a definite article for every variable under a quantifier. (113) is equivalent to:  $\exists x$  (John bought the  $x$  & the  $x$  is a car). Since the status of the definite article in semantic representations is still unclear, I do not insist on its being expressed everywhere in underlying structures. As a rule I only insert the definite article if the variable is not quantified.

<sup>13</sup> The variable  $e$ , which has been used so far as a variable ranging over extents, can now be treated in the same way. Instead of saying:  $\exists e$  (John is tall to  $e$ ) we can now say:  $\exists e$  (John is tall to  $e$  &  $e$  is an extent). This will transform, through Relativization and NP-Reduction, to: John is tall to an extent.

<sup>14</sup> The NP-Reduction rule is nothing else than what has been proposed by Bach in *Nouns and Noun Phrases* (1968). There, as here, it is immaterial for the rule whether the relative clause is restrictive or non-restrictive.

The sentence:

(117) John bought a red car.

is ambiguous. It is either derived from:

(118) the  $x$  (John bought  $x$  &  $x$  is a car) is red

by Noun Raising and Relative Raising. Or we can derive it from:

(119)  $\exists x$  (John bought  $x$  &  $x$  is a car &  $x$  is red)

Relativization may yield:

(120)  $\exists x$  (John bought  $x$  &  $x$ , which is a car, is red)

which, by Noun Raising, will become:

(121)  $\exists x$  (John bought  $x$  &  $x$  is a red car)

Further Relativization will give:

(122)  $\exists x$  (John bought  $x$ , which is a red car)

and hence (117). Another possibility is:

(123)  $\exists x$  (John bought  $x$ , which is a car, which is red)

which will lead to:

(124) John bought a car which is red.

If this treatment is, at least in principle, correct, then (100) must be derived from:

(125)  $\exists x$  (John bought  $x$  &  $x$  is an older car than that Ford)

The part  *$x$  is an older car than that Ford* will then have the same derivation as (73), discussed in Section 5. That is, (125) will be derived from:

(126)  $\exists x$  (John bought  $x$  &  $\exists e$  ( $x$  ( $x$  is a car) is old to  $e$  & not the  $y$  ( $y$  is a car & that Ford is  $y$ ) is old to  $e$ ))

in the same way as (73) was derived from (83). (126), in its turn, can be assumed to go back to:

(127)  $\exists x$  (John bought  $x$  &  $x$  is a car &  $\exists e$  ( $x$  is old to  $e$  & not the  $y$  ( $y$  is a car & that Ford is  $y$ ) is old to  $e$ ))

If the comparative treatment applies directly to the structure dominated by '∃e', the result will be:

(128)  $x$  is older than the car which that Ford is



(127) will then become something like:

- (129) (a) John bought an older car than the car which that Ford is.  
 or: (b) John bought a car which is older than the car which that Ford is.

We feel, however, that (129a and b) sound quaint and unnatural. This is probably due to the principle, mentioned earlier, that there should be maximum similarity between the two constituent S's of the comparative. Such a derivation would not be unnatural for, e.g.:

- (130)  $\exists x$  (John bought  $x$  &  $x$  is a car &  $\exists e$  ( $x$  is old to  $e$  & not the  $y$  (that table is  $y$ ) is old to  $e$ ))

which would result in:

- (131) John bought a car which is older than that table.

According to the principle of maximum similarity we relativize &  $x$  is a car in (127) under the  $x$  of  $x$  is old to  $e$ . The result is (126). Relativization would thus be outside the cycle and be allowed to apply wherever possible.

The fact that in (100) it is understood that a Ford is a car (so that it would be anomalous to replace *Ford* by, for example, *table*) is explained, in principle, by rule (116), NP-Reduction. From this rule it follows that (100) can only be derived from something like (125), which implies that a Ford is a car, as was shown in Section 5. If we give (130) the same treatment as (127), the derivation will block. (130) would then become:

- (132)  $\exists x$  (John bought  $x$  &  $\exists e$  ( $x$  ( $x$  is a car) is old to  $e$  & not the  $y$  (that table is  $y$ ) is old to  $e$ ))

Now the comparative will be:

- (133) the car is older than that table

so that (132) will be:

- (134)  $\exists x$  (John bought  $x$  & the car is older than that table)

which makes no sense and cannot be further developed by any rule. If, on the other hand, we apply Noun Raising to (132), the result will be, for the comparative part:

(135)  $\exists e$  (the  $x$  is an old to  $e$  car & not the  $y$  (that table is  $y$ ) is old to  $e$ )  
which does not allow for comparative treatment.

7. There is one category of comparative constructions which might seem to deal a fatal blow to the analysis given so far. Consider:

(136) John is taller than six feet.

The *than*-clause cannot be derived from *than six feet is tall*. This is implausible not only on semantic grounds, but also for syntactic reasons. If (136) had the same underlying structure and the same derivation as (61) above:

(61) John is taller than Bill.

we would expect the following to be grammatical:

- (137) (a) \*Six feet is less tall than John.  
(b) \*Six feet is as tall as John.  
(c) \*John is not so tall as six feet.  
(d) \*Six feet is smaller than John.  
(e) \*Six feet is not so tall as John.

In fact, however, these are all ungrammatical. Yet we have:

- (138) (a) Six feet is less than John is tall.  
(b) Six feet is as much as John is tall.  
(c) Six feet is not so much as John is tall.  
(d) Six feet is more than John is tall.  
(e) John is more than six feet tall.

This suggests that what is compared in (136) is pure quantity. We can make this suggestion explicit by assuming that (136) is derived from:

(139) John be tall to a greater extent than six feet (is).

If this is so, we have a case parallel to either (99) or (100). Let us see if (139) can be derived in a way analogous to either (99) or (100). A derivation according to the lines of (99) allows for a comparison with sentences such as:<sup>15</sup>

<sup>15</sup> This calls to mind Postal's analysis of comparatives: 'The degree to which John is tall exceeds the degree to which Bill is tall', which I found in Ross's handout (see note 4). Postal's analysis cannot be correct as it stands, since it does not take into account the negation element. But if we let *exceed* stand for 'be a greater extent than', we are close to our present proposal.

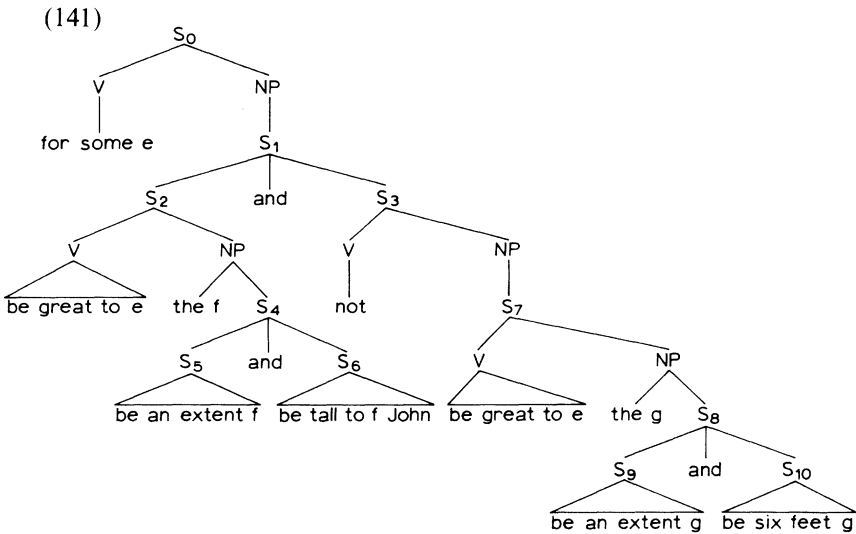
- (140) (a) The extent to which John is tall is greater than six feet.
- (b) What John is tall to is a greater extent than six feet.

More precisely, let us try to derive (139) in the following way, similar to (99):

From (141), SV-Inversion will convert  $S_5$  into:  $f$  be an extent;  $S_6$  into: John be tall to  $f$ ;  $S_9$  into:  $g$  be an extent;  $S_{10}$  into: six feet be  $g$ .

Noun Raising will convert  $S_2$  into: be a great to  $e$  extent the  $f$  (John be tall to  $f$ );  $S_7$  into: be a great to  $e$  extent the  $g$  (six feet be  $g$ ).

Now Relative Raising applies to  $S_7$ : six feet be a great to  $e$  extent, but not to  $S_2$ , under the principle of maximum similarity. After *and*-Deletion and SV-Inversion  $S_1$  will be: the  $f$  (John be tall to  $f$ ) be a great to  $e$  extent and six feet not.



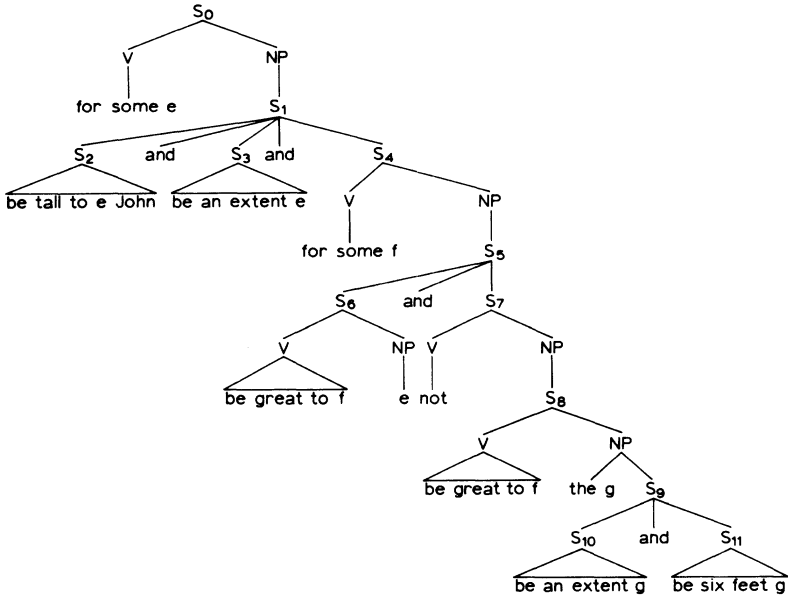
If Relative Raising now applies to  $S_0$ , we get: for some  $e$  (John be tall to a great to  $e$  extent and six feet not), which will then regularly become (139). But in reality the rule applies to  $S_1$ , which would violate the cyclical principle.

It is preferable to derive (139) in a way analogous to (100). Now it will be derived from:

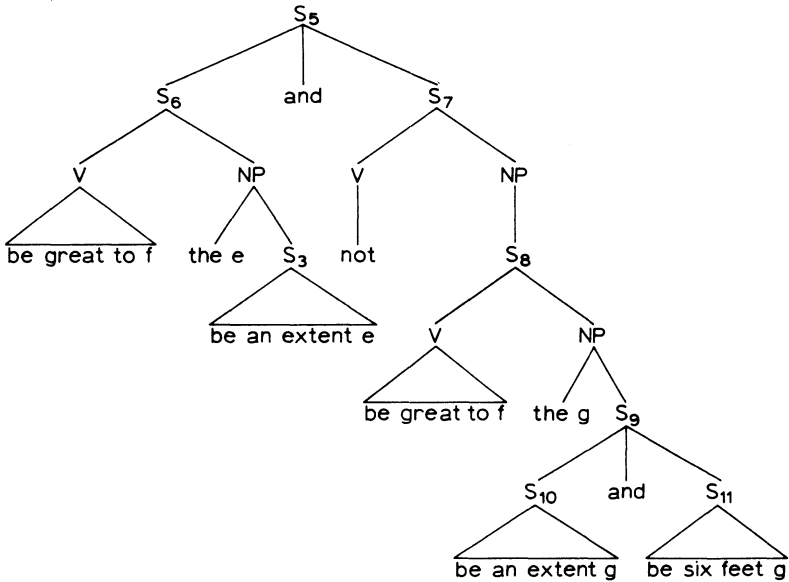
- (142)  $\exists e$  (John is tall to  $e$  &  $e$  is an extent &  $\exists f$  ( $e$  is great to  $f$  & not the  $g$  ( $g$  is an extent & six feet is  $g$ ) is great to  $f$ ))

or, more precisely, from:

(143)



Relativization will now attach  $S_3$  as a relative clause to the subject-NP of  $S_6$ , so as to ensure maximum similarity under  $S_5$ .  $S_5$  will now become:



SV-Inversion and Noun Raising apply as usual. Relative Raising applies to  $S_8$ . The result will be:

$e$  be a great to  $f$  extent and six feet not be a great to  $f$  extent

Comparative treatment will apply to  $S_4$ :

$e$  be a greater extent than six feet

Relativization will reduce  $S_1$  to:

John be tall to  $e$ , which be a greater extent than six feet

After Operator Incorporation on  $S_0$ , NP-Reduction will apply, yielding:

(139) John be tall to a greater extent than six feet.

There seems to be no straightforward way of finding out whether the indefinite article  $a$  in (139) represents genuine quantification, as in (100), or class inclusion, as in (99). It is intuitively satisfactory to let (139) correspond with (100), and

(144) John is tall to a greater extent than Bill.

with (99). The following observation might help to decide:

(145) John is tall to some greater extent than six feet.

sounds more natural to me than:

(146) ?\*John is tall to some greater extent than Bill.

We have concentrated our efforts, however, on (139), and not on (136), which was our point of departure. In order to derive the latter from the former we will need a rule:

(147) Adj – to – a – greater – extent  $\Rightarrow$  more – Adj.

In view of rule (64e), the *more-than* rule given above, this seems an *ad hoc* rule, too similar to (64e), which leads to the same result. We can avoid having the two rules (147) and (64e), however, by revising the treatment we gave to (61) (*John is taller than Bill.*). We take as the underlying structure for (61) not (63) given above, but rather:

(148)  $\exists e$  (the  $f$  ( $f$  is an extent & John is tall to  $f$ ) is great to  $e$  & not the  $g$  ( $g$  is an extent & Bill is tall to  $g$ ) is great to  $e$ )

which corresponds exactly to (141), with *be tall to  $g$  Bill* for  $S_{10}$ . This comes close to Postal's proposal mentioned in note 15.

We now drop rule (64e) and introduce a new rule, which will operate after NP-Reduction:

- (149) a great to some *e* extent – *X* – and – *Y* – not – *Z* ⇒ more – *X* –  
than – *Y* – *Z*

where ‘*e*’ ranges over extents, ‘*X*’ may be null, and either ‘*Y*’ or ‘*Z*’, but not both, may be null.

(148) will now be developed into:

- (150) John is tall to a great to some *e* extent and Bill not.

By rule (149) this becomes:

- (151) John is tall to more than Bill.

This will be converted into:

- (152) John is more tall than Bill.

by the following rule:

- (153) Adj –<sub>EP</sub> [to – NP] ⇒<sub>EP</sub> [NP] – Adj (‘EP’: *extent-phrase*)

This rule also converts:

- (154) John is tall to six feet.

(derived, by Relative Raising, from:

- (155) the *e* (John is tall to *e*) is six feet)

into:

- (156) John is six feet tall.<sup>16</sup>

This proposal reduces all comparatives to comparatives of *much*: *more* or *less*. There are, in fact, independent grounds for regarding the word *much* as a lexical item representing something like ‘a great extent’ or ‘a great amount’, parallel to rule (149) for *more than*. There are a number of observations which show that *much* not only has features that classify it as a noun phrase, but has also adjective-like properties. On the one hand, we see *much* occurring in expressions such as *much milk*, *He didn’t say much*, whereas \**The milk is much*. is ungrammatical. On the other hand we find an adjectival quality in, for instance, *very much*, *too much*, *more*.

The derivation proposed for comparatives will generate (136) directly. (141) will now lead to (if we allow Relative Raising to apply to  $S_0$ ):

<sup>16</sup> It will be noticed that Relative Raising, together with rule (153), predicts the correct stress on *more* and *six feet* in (152) and (156) respectively.

(157) John be tall to a great to some *e* extent and six feet not

and hence to (136). (143) will become first:

(158) for some *e* (John be tall to *e* and *e* be a great to some *f* extent and six feet not)

Hence:

(159) for some *e* (John be tall to *e* and *e* be more than six feet)

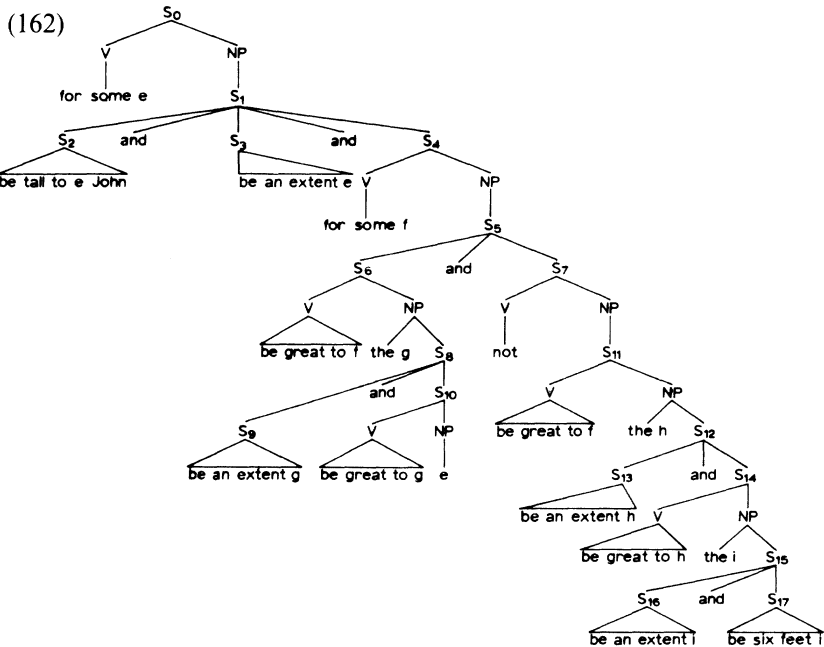
from which, by Relativization, Operator Incorporation and NP-Reduction:

(160) John be tall to more than six feet.

and hence (136) (or (138e)). However, (139) cannot now be the result of either (141) or (143). It will have to have an underlying structure of roughly the following form:

(161) John be tall to a great to a great to some *e* extent extent and six feet not.

Although the derivation of (139) will be long, no new rules are needed for it. Parallel to (143), we set up the following ultimate underlying structure:



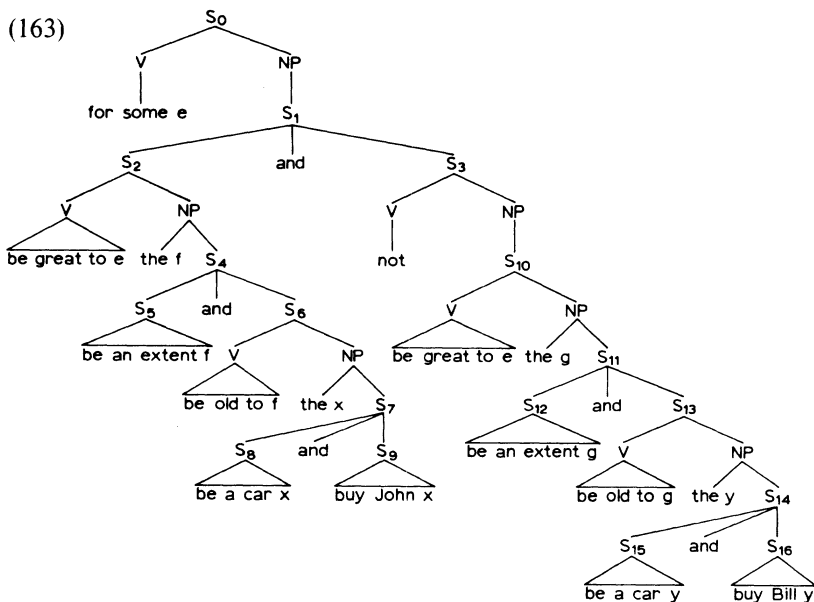
S<sub>3</sub> is attached as a relative clause to the subject-NP of S<sub>10</sub>.

S<sub>14</sub> – Noun Raising – be a great to *h* extent the *i* (six feet be *i*)

- Relative Raising - six feet be a great to *h* extent
- S<sub>11</sub> - Noun Raising - be a great to *f* extent the *h* (six feet be a great to *h* extent)
- Relative Raising - six feet be a great to a great *f* extent extent
- S<sub>7</sub> - Op-Inc. - six feet not be a great to a great to *f* extent extent
- S<sub>10</sub> - Noun Raising - be a great to *g* extent *e*
- SV-Inversion - *e* be a great to *g* extent
- S<sub>6</sub> - Noun Raising - be a great to *f* extent the *g* (*e* be a great to *g* extent)
- Relative Raising - *e* be a great to a great to *f* extent extent
- S<sub>5</sub> - *and*-Deletion - *e* be a great to a great to *f* extent extent and six feet not
- S<sub>4</sub> - Op-Inc. - *e* be a great to a great to some *f* extent extent and six feet not
- rule (149) - *e* be a great to more extent than six feet
- rule (153) - *e* be a more great extent than six feet

Relativization of *e*, Operator Incorporation on S<sub>0</sub> and NP-Reduction will yield (139).

In the same way, the derivation of (99), *John bought an older car than Bill*, will remain essentially the same as that given in (110), but will involve a few more steps. Instead of (110) we give the following underlying tree:





$S_{13}$ will become:	Bill buy an old to $g$ car.
$S_{10}$ will become:	Bill buy an old to a great to $e$ extent car.
$S_2$ will become:	John buy an old to a great to $e$ extent car.
$S_0$ will become:	John buy an old to a great to some $e$ extent car and Bill not.

Hence, by rules (149) and (153):

John buy a more old car than Bill.

We conclude that the apparent counterexample:

(136) John is taller than six feet.

far from disconfirming the analysis of the comparative given in previous sections, has led to a minor revision, which reduces all comparatives to forms of *more* (or *less*), and has in fact confirmed the analysis.

8. If, as was proposed above, (61), *John is taller than Bill*, is analyzed as:

(148)  $\exists e$  (the  $f$  ( $f$  is an extent & John is tall to  $f$ ) is great to  $e$  & not the  $g$  ( $g$  is an extent & Bill is tall to  $g$ ) is great to  $e$ )

then the question arises how to analyze:

(164) John is two inches taller than Bill.

In other words, what is the status of the constituent which indicates the degree of difference? The answer is not immediately obvious. Probably we have to do here with some sort of *for*-phrase, or 'extension phrase', placed before *not*:

' & for two inches it is not the case that the  $g \dots$  '

A *for*-phrase of this kind is comparable to durative phrases (which are, perhaps, a subspecies of extension phrases):

(165) I haven't been in England for two years.

This sentence is ambiguous. It either means:

(166) For two years it has not been the case that I was in England.

or:

(167) It is not the case that for two years I have been in England.

But:

(168) I haven't won a match for two years.

is not ambiguous; it only allows for an interpretation analogous with (166). Certain verbs, such as *not* or *be in England*, allow for a durative phrase. Other verbs, such as *win a match*, do not, which accounts for the non-ambiguity of (168). In the same way, it may be suggested, *not* freely allows for an extension phrase to be its immediate higher verb, but not, for example, *be great to an extent*. However, the matter is speculative.

General problems of underlying quantification and of tense and aspect are involved here, which cannot be disentangled now. The question of the status of the constituent *two inches* cannot be considered separately from the wider issue, not touched upon so far, why it is that, e.g.:

(169) Bill is not so tall as John.

is synonymous with:

(170) Bill is less tall than John.

and cannot mean that Bill is taller than John.<sup>17</sup>

An indication that we have to do with a *for*-phrase of extension, is:

(171) But for two inches Bill is as tall as John.

which can be analyzed as:

(172) For two inches it is not the case that Bill is as tall as John.

The same kind of *for*-phrase is found in, for example:

(173) But for one town the army is in control of the country.

We do not have to be certain, however, as to the status of the constituent *two inches* in order to be able to derive the following sentence:

(174) John is more taller than Bill than Peter.

with the help of the rules that have been proposed so far. In carrying out the derivation, let us assume that *two inches* is derived from a scope-bearing verb 'for two inches'. The precise form of this assumption, however, is not essential for the derivation. (174) can be paraphrased as:

(175) The extent by which John is taller than Bill is greater than the extent by which Peter is taller than Bill.

<sup>17</sup> It is perhaps possible to account for this by considering  $\exists e (x \text{ be great to } e)$  as derived from:

$\exists e \forall v (v \in e \supset x \text{ be great to } v)$  where 'v' stands for 'value'

The comparative would then be analyzed as:

$\exists e (\forall v (v \in e \supset x \text{ be great to } v) \& \text{ not } \forall v (v \in e \supset y \text{ be great to } v))$

which gives the correct interpretation. The matter cannot be pursued here, however.

In accordance with the assumptions hitherto adhered to, the deepest underlying structure will be (176). The derivation will run as follows:

- $S_{29}$  – Noun Raising – be a great to *i* extent the *h* (Bill be tall to *h*)  
 – Relative Raising – Bill be tall to a great to *i* extent  
 $S_{24}$  – Op-Inc. (twice) – for *b* Bill not be tall to a great to *i* extent  
 $S_{23}$  – as  $S_{29}$  – Peter be tall to a great to *i* extent  
 $S_{21}$  – Comparative – Peter be *b* taller than Bill  
 $S_{18}$  – Noun Raising – be a great to *e* extent the *b* (Peter be *b* taller than Bill)  
 – Relative Raising – Peter be a great to *e* extent taller than Bill  
 $S_3$  – Op-Inc. – Peter not be a great to *e* extent taller than Bill  
 $S_2$  – as  $S_{18}$  – John be a great to *e* extent taller than Bill  
 $S_1$  – *and*-Deletion – John be a great to *e* extent taller than Bill and Peter not  
 $S_0$  – Op-Inc. – John be a great to some *e* extent taller than Bill and Peter not

Rule (149) converts this into:

John be more taller than Bill than Peter

which is close enough to (174).

The process is, of course, recursive: we can say how much more John is taller than Bill than Peter, and it may be the case that John is more more tall than Bill than Peter than Arthur.

9. We have tried to solve a number of problems by giving analyses and rules which have some explanatory value. The cases that have been dealt with seem to me to be central to the question what the essential grammatical structure of the comparative is. There are many aspects of this type of construction, however, that have not been touched upon. Thus, nothing has been said about 'negative' comparatives with *less than*; nor about the use of negative gradables (*young, new, short, small, etc.*) in comparatives; nor about the relations between comparatives and constructions such as *not so Adj as*, or *as Adj as*, or *too Adj to*, to mention just a few examples. There does not seem to be any reason to predict, however, that further investigation of these constructions would bring to light counterevidence to the analysis proposed here.

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