The Empty Element in Comparatives

Friederike Moltmann

University of Amsterdam

This paper is about the empty element in Comparative Deletion sentences such as (1).

(1) John wrote more books than Bill read t.

(1) raises two questions. First, what is the syntactic status of the empty element? Second, how can (1) be understood as in (2), where t is a variable for numbers.

(2) John wrote more books than Bill read t-many books.

Thus the issue is how can the empty element e in (1) can be interpreted as 't-many books'.

The answers that I will give to the two questions consist in an analysis of Comparative Deletion as antecedent-contained deletion based on a copying operation along the lines of May (1985) and Fiengo/May (1991) and on Haik's (1987) proposal according to which an operator may at S-structure bind a categorially inappropriate variable which is replaced by a semantically appropriate element only at LF.

This paper is organized as follows. I will first show in more detail what the issues are that (1) raises. Then I will discuss two possibilities of dealing with (1): first the 'layered trace approach' of Pinkham (1982) and second what I call the 'PF deletion approach'. I show that both approaches face serious problems, given some further data about comparatives. I then present my own proposal, the 'copying approach'. I will give further evidence for this proposal on the basis of various Comparative Deletion constructions with pronouns. Furthermore, I show how the proposal receives indirect support from another phenomenon, namely an indefiniteness effect in attributive comparative constructions.

1. The problem

An important observation about Comparative Deletion has been made by Chomsky (1977), namely that it displays subjacency effects:

(2) a. *John wrote more books than Mary asked whether Bill read.
  b. *John wrote more books than Mary met a man who read.
  c. * John wrote more books than Mary invented a rumor that Bill read.

Chomsky therefore proposed that (1) involves wh-movement of an empty operator to the SPEC(COMP) position of the clause following *than*, as in (3):

(3) John wrote more books than $[O_i[Bill read t_i]]$.

Thus the empty element in (1) is considered a variable bound by an operator that appropriately enters the semantic relation expressed by the comparative construction.

However, Chomsky's proposal raises a crucial problem. This problem is that (3) does not provide an appropriate syntactic basis for the semantic interpretation of (1). (1) describes a comparison between the number of books John wrote and the number of books, not, for instance, newspapers or journals or letters, that Bill read. For example, (1) can never mean (4):

(4) John wrote more books than Bill read newspapers.

Furthermore, with (3) it is unclear how the comparative operator could stand for the right kind of entity. What the empty operator has to stand for are numbers in (1) or degrees as in (5).

(5) John is stronger than Bill is t.

The empty operator cannot stand for 'books' in (3) or the property of being strong in (5). But this does not come out in the analysis in (3), where the operator is of the category NP.

The right syntactic basis for the semantic evaluation of (1) can only be as in (6), where the empty operator in SPEC(COMP) of the comparative clause binds a variable for numbers or degrees which is part of an NP that corresponds to the comparative NP in the main clause:

(6) John read more books than $[O_i [Bill read t_i$-many books]].

But then the question is, how can the empty element in (1) be interpreted as 't-many books' at LF. I will first discuss two proposals one of which has been made in the literature, the other one bring a mere, though plausible possibility.

2. Two approaches to the identification problem with Comparative Deletion

2.1. The layered trace approach

The first proposal that I will discuss has been made by Pinkham in her (1982) dissertation. Pinkham proposes that the empty element in (1) is base-generated as a structured empty element (layered trace) whose constituents enter binding relations to the empty operator or corresponding parts in the main clause:

(7) John wrote more books$_k$ than O$_i$ Bill read [e$_i$[e$_k$]].

In (7), the specifier of the layered trace enters a binding relation to the comparative operator, the noun enters a binding relation to *books* in the main clause. Thus, (7) provides an adequate basis for the interpretation of (1); in particular, the empty comparative operator will bind the semantically appropriate element.

However, there are serious problems with Pinkham's proposal. First, it is rather unclear what kind of binding relation there should be between the empty noun and the adjective. A relation between a noun binding an empty noun in another clause does not seem to occur in other context, for example not in (8)a and b, where the NP as a bare plural arguably contains an empty determiner, thus matching the NP in (7).

(8) a. * John wrote books and Bill read [e[e]].
    b. * John wrote books before Bill read [e[e]].

Second the structure in (7), in particular the relation between the empty operator and the degree variable, violates the Left Branch Constraint. The Left Branch Constraint in its original formulation is given in (9) (cf. Ross 1967):

(9) The Left Branch Constraint (LBC)
    No constituent which is leftmost in an NP can be moved out of this NP.

The Left Branch Constraint can be considered an instance of subjacency, as has been argued in detail by Corver (1990).
    We are then faced with the following puzzle: the operator-variable relation in Comparative Deletion sentences displays island effects; but if the operator binds an appropriate variable, it violates the LBC, hence subjacency.
    As for many apparent violations of subjacency, a possible solution to this dilemma would be Pied-Piping. That is, the entire layered trace would move to SPEC(COMP) at S-structure, as in (10).

(10) John wrote more interesting books than [e[e[e]]] Bill read e.

Again, in order for (10) to be interpretable, one might assume movement of the empty specifier out of the layered trace.
    But also the Pied-Piping solution is problematic. It is reasonable to assume that Pied-Piping of a layered trace is possible in a given language iff Pied-Piping of a corresponding overt expression is possible in that language. This is the case for (10), as seen in (11).

(11) How many interesting books did Bill read t?

But there are Comparative Deletion construction that would require Pied-Piping, but where Pied-Piping of a corresponding overt expression is not possible. Such a construction is what I call 'Clausal Comparative Deletion':

(12) John wrote more books than I thought.

Let me briefly digress and discuss the nature of the construction in (12) in more detail. There are two possible views on the construction in (12) which do not treat the empty clausal element as an instance of Comparative Deletion. First, the empty element might be considered an instance Null Complement Anaphora (NCA), as was suggested by Napoli (1983). Null Complement Anaphora are empty clausal complements of verbs like *know* or *suspect*, referring back to a proposition given in the preceding discourse, as in (13):

(13) A: John has arrived.
      B: I know / suspected.

However, it is easy to see that (12) cannot be an instance of NCA. NCA is possible only with a limited number of verbs; but the construction in (12) is possible with any verb taking a clausal complement:

(14) a. A: John has arrived.
         B: * I feared / expected / I hoped / had said.
      b. John wrote more books than I feared / expected / had said.

Another possible view on the construction in (12) would be to consider it as some kind of coordinate construction involving an implicit performative verb. Since comparatives exhibit some diagnostics of coordination (cf. Napoli 1983, Hendriks 1991, Moltmann 1992), such an analysis would not be unmotivated. The empty clausal element then would be an instance of ellipsis in coordinate structures. Assuming a three-dimensional theory of coordination (cf. Goodall 1987, Muadz 1991, Moltmann 1992), the most plausible analysis under such a view would be as in (15), where *John wrote more books* is in a 'Right Node Raising-position' and *than* acts as a coordinator.

(15)   I ASSERT
       than   John wrote more books
            I thought

However, such an analysis is rather implausible. In particular, a Right Node Raising construction such as (15), as the name says, would be linearized differently, namely as in (16):

(16) I expected that John wrote more books.

Given that there is no plausible alternative analysis, I conclude that the construction in (12) is an instance of Comparative Deletion, where the object of *thought* is an empty clause that is to be interpreted as 'John wrote t-many books', as in (17).

(17) John wrote more books than O I thought John t-many books.

Now let us get back to the issue of Pied-Piping within the layered trace approach. Given the layered trace approach, (12) would be base-generated as in (18).

(18) John wrote more books than I thought [CPe[e[e[e]]]]].

However, (18) is problematic in two ways if pied-piping should apply in order to avoid a subjacency violation. First, Pied-Piping might involve moving the entire empty CP. But this is implausible, because Pied-Piping of overt clauses is not available in English:

(19) * That how many books were sold did you think?

Second, the NP inside the layered clausal trace might be pied-piped alone. But this is implausible. For instance, variables should be Case-marked (Safir 1985); but empty verbs cannot Case-mark.

There are other problems with the layered trace approach. In particular, there does not seem to be independent evidence for the internal structure of traces with elements that have the status of pronouns. Pinkham tries to give such evidence from French, where overt pronouns can appear in Comparative Deletion contexts:

(20) Jean a écrit plus de livres que Marie én a lu.
     'John has written more books than Mary of them has read.'

However, the appearance of *en* in French comparatives can be correlated with the possibility of *combien*-extraction in the same language, as in (21):

(21) Combien est-ce-que Jean en a lu?
     'How much has John of them read?'

This strongly suggests that a different analysis of the pronoun is required than the one in which it is the head of an otherwise empty NP.

2.2. The PF deletion approach

I will now discuss a second possible approach to Comparative Deletion, namely what I call the 'PF deletion approach'. In this approach, the full NP that is required for semantic interpretation is base-generated in the Comparative Deletion site. It will also be present at LF; but it will be deleted at PF. In this account, the D-structure, S-structure and PF of (1) will be as in (22).

(22) John read more books that Bill read t-many books.

But the PF deletion account, obviously, raises the same subjacency problem as the layered trace account. Again a pied-piping solution would be available. Then the S-structure of (1) would be as in (23):

(23) John read more books than [t-many books [Bill read t]].

But Pied-Piping here is problematic as it would distort the identity or recoverability requirement on deletion.

3. The proposal: Copying into the Comparative Deletion site

What I will propose regarding the interpretation and subjacency problem with Comparative Deletion is the following. The NP *'t-many books'* in (22) is the result of a copying operation at LF after an operator-variable relation between the empty element and the comparative operator in SPEC(CP) has been established at S-structure. Furthermore, I will follow the often held assumption that subjacency does not hold at LF, but at S-structure only. Let me develop this account in detail, starting with the required copying operation.

Comparative Deletion cannot involve literal copying of elements in the main clause into the Comparative Deletion site. Otherwise, an infinite regress will result:

(24) John wrote more books than Bill read more books than Bill read more
     books ...

In this respect, Comparative Deletion behaves exactly the same way as Antecedent Contained Deletion (ACD) with quantified NPs and VP Deletion, as in (25)a. With literal copying, (25)a leads to the infinite regress indicated in (25)b.

(25) a. John read every book Bill read.
     b. John read every book Bill read every book Bill read ...

A proposal of accounting for ACD as in (25a)a has been made by May (1985). (See also Fiengo/May 1991). May's account rests on the assumption that the quantified NP undergoes Quantifier Raising (QR), yielding (26) as the LF of (25a):

(26) [every book Bill did t'] John read t.

This allows copying of the VP containing the VP trace *read* t into the empty VP position, yielding (27):

(27) [every book Bill read t] John read t.

The assumption of Quantifier Raising is not absolutely necessary for treating ACD on the basis of copying. Another way of avoiding the infinite regress problem is to allow copying that modifies the copied elements somewhat. In particular, one might assume that quantified NPs may be copied as variables, as was proposed by van den Wuyngard/Zwarts (1991) (see also Lasnik 1992). Then the VP *read every book Bill did* would be copied as *read* t. A copying rule that allows for modification was in fact assumed by Fiengo/Mary (1991) in order to allow R-NPs to be copied as pronouns ('vehicle change'). To allow for quantified NPs to be copied as variables would be an extension of vehicle change; but, of course, it requires further justification which I will not go into. In any case, the present discussion should be neutral regarding the issue of Quantifier Raising.

May's account of ACD can straightforwardly be applied to Comparative Deletion. It is plausible to assume that the comparative operator *-er* and the *than*-clause, which arguably form a syntactic unit at some level (cf. Bresnan 1973), undergo QR together, yielding (28).

(28) [-er than Bill read t'][John wrote t-many books]

(28) now provides the adequate expression to be copied into the Comparative Deletion site, i.e., *t-many books*, yielding (29):

(29) [-er than Bill read t-many books][John wrote t-many books]

Comparative Deletion based on copying could, of course, also be accounted for without invoking QR, namely on the basis of vehicle change of the comparative operator -er together with the *than*-clause as a degree variable.

May's account of ACD solves the problem of how Comparative Deletion sentences can receive the right interpretation. However, the account does not explain why Comparative Deletion displays island phenomena. I propose an account of the subjacency problem that takes up an idea of Haik (1987), who noted that ACD with quantified NPs and VP Deletion displays island phenomena:

(30) a. * John saw every man Sue asked whether Bill did.
     b. * John saw every man Sue head a rumor that Bill did.

Haik's idea was to allow the relative clause operator in (25a) to bind a categorially inappropriate VP variable at S-structure. Only at LF will a meaningful operator-variable be established by replacing the VP variable by a full VP containing the categorially appropriate NP variable. Haik assumed the principle in (31):

(31) An operator may bind a categorially inappropriate element at S-structure as long as a meaningful operator-variable relation is restored at LF.

Haik's idea provides a solution to the subjacency problem with Comparative Deletion. At S-structure, a Comparative Deletion sentence will have exactly the structure Chomsky (1977) proposed; i.e., (32):

(32) John wrote more books than O_i Bill read t_i.

The comparative operator will bind an NP variable, entering a relationship that is not interpretable, but satisfies subjacency. Then at LF, the variable will be replaced by 't-many books', allowing the operator to bind the right kind of variable, as in (33).

(33) John wrote more books than O_i Bill read t_i-many books.

I will assume, following a number of scholars (Huang 1982, Lasnik/Saito 1984 among others) that subjacency is suspended at LF; hence (33) is well-formed at that level.

What makes this account perhaps somewhat suspicious is that it rests on the rather controversal assumption that an operator may enter an uninterpretable binding relation to a variable at S-structure. Let me therefore go further into this issue.

There are several ways one could conceive of the empty operator and the variable in (32). First, one might conceive of it, as it was formulated above, that the operator is a degree operator and the variable an NP variable. Given this view, the operator could not have come into its position of movement; but rather has to base-generated there. But then subjacency would have to be a condition on representation, rather than on movement, a consequence not everybody would want to allow (cf. Lappin 1991). Another implication of this view would be that category match is not part of the syntactic relation of variable binding. This implication is

less controversial, in particular since only syntactic relations at LF need to be interpretable semantically.

A second possibility to view the relation between the operator and the variable in (32) would be to assume that the variable itself is base-generated as a degree variable. This view would require that the selectional requirement imposed by the verb, namely that its complement be an NP, need to be satisfied only at LF. This consequence is not implausible, again, because meaningful syntactic relations need to be established only at LF. In fact, the assumption that categorial selection is checked only at LF has been held in a different context, namely in relation to quantifiers in Russian by Pesetsky (1982). I will not make a decision regarding the two views in this paper, but only wanted to mention the two possibilities.

The proposed analysis of Comparative Deletion can straightforwardly account for Clausal Comparative Deletion. The S-structure of (34a) will be as in (34b), where the operator binds a propositional variable, and the LF as in (34c), where the variable is replaced by a (modified) copy of the main clause, allowing the operator to bind an appropriate variable.

(34) a. John wrote more books than I thought.
 b. John wrote more books than O I thought e.
 c. John wrote more books than I thought John wrote t-many books.

This treatment of Clausal Comparative Deletion still raises a number of questions. Unlike VP Deletion, 'Clausal Deletion' never seems to occur in a context other than comparatives:

(35) * John said that it is raining and Mary said.

In particular, even when there is an empty operator as in relative clauses in (36), deletion of a clausal element is not possible:

(36) * John saw every man Mary said.
   (meaning John saw every man Mary said that John saw)

Apparently, empty clauses are licenced only in the context of another operator, i.e., as clausal variables. Furthermore, apparently, the operator may only be a degree operator - whatever the reason for that may be.

Let me now turn to another range of data that indirectly confirm or at least are compatible with the analysis that I have proposed, namely comparative sentences in which a pronoun appears in place of an empty element in what would be the Comparative Deletion site.

4. Accounting for the appearance of pronouns in comparative deletion context

4.1. Pronouns in Clausal Comparative Deletion contexts

In German, a pronoun optionally may appear in Clausal Comparative Deletion contexts:

(37) Hans hat mehr Buecher gelesen als ich (es) erwartet habe.
   'John has read more books than I expected (it).'

How could the occurrence of the pronoun in (37) be handled in the three approaches to Comparative Deletion? In the layered trace approach, one is forced to say that the pronoun comes out as a replacement of the layered trace at PF. However, there does not seem to be independent evidence for such a trace-replacement rule at LF.

In the PF deletion approach, one would have to say that the deletion operation at PF may be followed by a pronoun replacement operation, inserting a pronoun into the deletion site. Again, there does not seem to be independent evidence for a pronoun insertion rule at PF, replacing traces that result from deletion at PF.

The most natural account of the occurrence of the pronoun in (37), it seems, can be given within the present approach: the pronoun will be base-generated as a variable and be bound, though not in a semantically interpretable way, by the comparative operator. Then, at LF, the pronoun will be replaced by a full clause, with the comparative operator now binding an appropriate degree or number variable in the clause. Thus, in this account, the pronoun is an 'antecedent-contained proform'.

4.2. Kind-referring pronouns in generic comparatives and 'such as'-clauses in German

The second type of phenomenon I want to discuss where a pronoun appears in what would be the Comparative Deletion site again is found in German. In German, definite pronouns may occur in the 'Comparative Deletion site' in generic comparatives, as in (38), and 'such as'-clauses, as in (39):

(38) a. Hans macht bessere Kleider, als man sie in diesem Laden findet.
      'John makes better clothes than one finds them in this store.'
    b. Maria hat noch nie so schoene Blumen gesehen, wie sie in Holland wachsen.
      'Mary has never so beautiful flowers seen as they grow in Holland.
(39) a. solche Blumen, wie man sie in Holland findet
      'such flowers as one finds them in Holland'
    b. solche Kleider, wie sie Hans macht 'such clothes as John makes them'

Definite pronouns are impossible if the comparative clause (following *than*) is nongeneric, as in (40a), though the main clause may be so, as in (40b):

(40) a. Hans hat gestern bessere Kleider verkauft, als man sie in diesem Laden findet.
      'John yesterday sold better clothes than one can find in this store.'
    b. # Hans has bessere Kleider verkauft, als Maria sie verkauft hat.
      'John has sold better clothes than Mary sold them.'

Furthermore, they are impossible with comparatives expressing a comparison of quantity, rather than quality, as in (41):

(41) # Hans macht mehr Kleider, als Maria sie macht.
    'John makes more clothes than Mary makes them.'

Why are definite pronouns possible in precisely those contexts and why are they possible in German, but not in English? The analysis of this phenomenon that I propose is as follows. First, the definite pronoun must always is a kind-referring pronoun. From this it follows that they can occur only in generic comparative clauses and in 'such as'-clauses, which themselves are generic in nature. Also it follows that the pronoun must occur in a context in which the quality of its referent is relevant, not its quantity, since kinds are generally characterized by qualities, not by the quantity of its instances. Second, the definite pronoun is bound not by the comparative NP *bessere Kleider* or *solche Blumen*, but rather only by the noun *Kleider* or *Blumen*. That way, it can maintain its usual function of being coreferential with an anteceedent. But how can a definite pronoun be coreferential with an N'? The only way a coindexing relation between a definite pronoun and a head noun could be interpreted would be by construing both the N' and the definite pronoun as kind-referring terms. This is possible because the meaning of a noun generally stands in a one-to-one relationship to a kind. Thus, in (38a), *sie* refers to the kind characterized by *Kleider* and in (39) to the kind characterized by *flowers*. But still the comparative operator has to bind something in the Comparative Deletion site. This will be a degree phrase containing a degree variable.

The third idea in the analysis that I propose is that the pronoun in the Comparative Deletion site is licenced due to a NP-restructuring rule in German. This rule allows NPs to be separated into two parts, one including the specifier and the other one the head noun, and be restructured as two NPs. This rule, which is, simplified, given in (42), arguably is at stake with *was fuer*-split, as in (43a) and quantifier split, as in (43b), as has been proposed by Bennis (1983).

(42) [$_{NP}$D (AP) N] --> [$_{NP}$D (AP)][$_{NP}$N]
(43) a. Was sind fuer Leute gekommen?   what have for people come
     b. Leute sind keine (guten) gekommen.   people have none (good) come

Given this rule, (38a) would have the analysis in (43a), and (39) the one in (43b).

(44) a. Hans macht [-er t-gute [Kleider]$_i$] als O$_j$ Maria [t$_j$-gute][sie]$_i$ macht.
     b. [solche [Blumen]i] wie O$_j$ es [t$_j$-artige][sie]$_i$ in Holland gibt.

I will assume that t-*gute* in the 'als'-clause in (44a)a is the result of copying only a relevant part of the NP in the main clause, in the way described earlier. Thus, (38a) before coping has the S-structure representation (45):

(45) Hans macht [-er t-gute [Kleider]$_i$], als O$_j$ Maria [e]$_j$[sie]$_i$ macht.

In (43a)a *sie* is bound by the noun *Kleider*, and in (43b) by the noun *Blumen*. The remaining question that has to be answered is how an appropriate compositional analysis of [x-*gute*] [*sie*] could be obtained. What I will assume is that t-*gute* restricts the kind corresponding to *Kleider* to a subkind characterized by a certain degree of being good. This is in fact the ordinary way of modifying kind-denoting NPs as, for instance, in (46):

(46) Very good clothes are rare.

5. Further evidence for the copying approach: the indefiniteness effect in attributive comparatives

There is another phenomenon which provides an argument favor the copying approach to Comparative Deletion over the rival approaches; I will, however, not be able to give a full analysis of the phenomenon.

This phenomenon consist in a certain kind of indefiniteness effect in attributive comparative constructions as in (47).

(47) a. A taller man than Mary met yesterday entered the room.
    b. Better students than Mary had ever seen before failed the exam.

Crucially, the NP in this construction that is modified by the comparative adjective and the comparative clause has to be indefinite; it may neither be quantified nor definite:

(48) *Every taller man / Most taller men / A lot of taller men / The taller man
    than Mary met yesterday entered the room.

However, the constraint in question does not coincide with the familiar definiteness effect. It is stronger than the indefiniteness requirement that obtains, for example, in existential sentences. Unlike in existential sentences, in attributive comparative constructions, the relevant NP may not even contain cardinality specifiers such as *three*:

(49) a. There were three men in the garden.
    b. * Three taller men than Mary met yesterday entered the room.

There are two meanings that (49)b could have: first, (49)b could mean 'three taller men than a man Mary saw yesterday'. Second, it could mean 'three taller men than three men Mary met yesterday'. But (49)b is impossible with both meanings.

The indefiniteness constraint on attributive comparatives raises two questions: [1] What is it about attributive comparative clauses that triggers this constraint? [2] Is the constraint syntactic or semantic in nature?

Concerning the first question, the crucial observations is that the constraint must be due to the presence of the comparative clause. The constraint does not hold when the degree of comparison is not provided by a comparative clause, but is given by the discourse context instead:

(50) Every taller man / Most taller men / Few taller men / The taller men / Three
    taller men entered the room.

Concerning the second question, the constraint appears to be, at the face of it, syntactic, rather than semantic in nature. At least this may be concluded from evidence such as the acceptability of corresponding relative clause constructions, which would plausibly be semantically equivalent:

(51) All / Most / Few / The / Three men who are taller than the man Mary saw
    yesterday entered the room.

From these two observations we may conclude that an explanation has to rely on the syntactic structure of the comparative clause.[1] What I will discuss now are not

fully developed explanations of the phenomenon, but rather a plausible basic idea that might provide the basis for an adequate explanation.

This basic idea is that the indefiniteness condition on attributive comparatives comes about because of a constraint on the Comparative Deletion site, not as a constraint on the entire NP. This idea rests on the assumption that the entire NP (with appropriate modifications) will be copied into the Comparative Deletion site and, as a condition imposed by the target site of the copying operation, has to be indefinite itself. Thus, the way the indefiniteness requirement would be effected would be as in (52), which represents (47a) after copying of the missing material into the Comparative Deletion site:

> [+indefinite] <------------------- [+indefinite]
> (52) A taller man than [O Mary saw a t-tall man].

Given this general idea, it follows immediately that the indefiniteness condition does not hold for attributive comparative constructions without comparative clause. Furthermore, the nature of the explanation could be semantic only in an indirect way, depending on whether the indefiniteness condition on the Comparative Deletion site is syntactic or semantic in nature.

If the assumption about source of the indefiniteness effect as indicated in (52) is correct, the explanation of the constraint strongly favors the copying approach over the layered trace approach.

Given the layered trace approach, the empty NP in the Comparative Deletion site would contain an empty determiner that would have to enter a binding relation to the determiner in the main clause. However, such a binding relation between determiners is seriously implausible. Unlike for nouns, there is nowhere else such a binding relation between determiners.

The indefiniteness effect could also be explained within the PF deletion approach. Given that approach, the NP generated in the Comparative Deletion site would have to be identical to the NP in the main clause in order to be deletable at PF, due to the recoverability condition on deletion. Thus, the indefiniteness effect would not constitute an argument against the PF deletion approach. But we have seen that there are other arguments against the PF deletion approach.

Now, of course, the crucial question is, why should there be an indefiniteness condition on the Comparative Deletion site? There are several ways to conceive of an answer to this question. I will only briefly go into some considerations that might bear on an explanation.

One might link the indefiniteness effect to the Name Constraint (cf. May 1977). The Name Constraint requires that an NP do not contain a variable bound by an operator outside the NP. Clearly, the NP in the comparative clause in (47a) has to be subject to the Name Constraint, since the degree variable it contains is bound by the comparative operator from the outside.

However, the Name Constraint captures only part of the constraint on the NP in the Comparative Deletion site. It is generally assumed that the NPs that are excluded by the Name Constraint are definite and quantified NPs, but not NPs with cardinality attributes *three* or *a lot*. But we have seen that the indefiniteness constraint on the Comparative Deletion site also excludes indefinite NPs with cardinality attributes. Furthermore, the Name Constraint generally allows for nonspecific definite NPs, as e.g., in (53a). But nonspecific definite NPs are also excluded in the attributive comparative construction, as seen in (53b).

(53) a. Who did John steal the only portrait of e?
     b. * The only taller man than Mary has seen

Thus, a stronger constraint is at work in attributive comparative constructions than the Name Constraint.

For an adequate characterization and explanation of the constraint, an important observation is that the constraint is displayed also by other constructions that share certain properties with attributive comparative constructions.

First, the constraint shows up also with pied-piped NPs in questions about degrees. This is the case in English, where the degree phrase has to be moved in front of the determiner, as in (54), as well as in a language like German, where the degree phrase is not preposed in front of the determiner, as in the examples in (55).

(54) How tall a / * the / * every man / * three men did Mary see?
(55) a. Einen wie grossen Mann hat Maria gesehen?
        a how tall man has Mary seen
     b. Einen / * Den wie / jeden wie grosses Mann / drei wie grosse Maenner hat Maria gesehen?
        the / every how tall man / Three how tall men has Mary seen

Note that the constraint on NPs with degree question words is not a general restriction on Pied-Piping. Pied-piped NPs seem to be subject only to the Name Constraint:

(56) a. the book three chapters of which / the end of which John wrote
     b. the man the books / all books about whom were recently published

The relevant generalization rather is that the restriction obtains for all NPs modified by an adjective with a specifier such as -er, too, so, as, or such:

(57) a. too happy a / * the / * every / * the only man / * three men
     b. as happy a / *the / *every / * the only man / * three men
     c. so happy a / *the / * every / *the only man / three men
     d. such a / *the / * every / *the only man / three men

What these adjectival specifiers have in common is that they all take implicit or explicit complements such as than- or as-phrases or -clauses or resultative clauses:

(58) a. too happy a man too cry
     b. as happy a man as John has been
     c. so happy a man that everyone became jealous
     d. such a happy man that everyone became jealous

In this respect, they differ from very, which does not impose the definiteness restriction as it does not take a complement:

(59) a / the / every / very happy man

A second context where the indefiniteness constraint also shows up are head-internal relative clauses. The head NPs in head-internal relative clauses in languages

such as Lakhota (cf. Williamson 1987) and Japanese (Watanabe, p.c.) have to be indefinite. This is illustrated for Japanese in the following (cf. Watanabe, p.c.):

(60) a. [John-ga   ringo-o   katta-no]-o   Mary-ga   tabeta
          -NOM apple-ACC bought-GEN-ACC -NOM ate
      'Mary ate apples that John bought.'
    b. *[John-ga   sono ringo-o katta-no]   Mary-ga   tabeta
          -NOM every apple-Pt bought-GEN-ACC   -NOM ate
      'Mary ate every apple that John bought.'
    c. *?[John-ga   sono   ringo-o   katta-no]   Mary-ga   tabeta
          -NOM 3-cl-GEN apple-ACC bought-GEN-ACC -NOM ate
      'Mary ate three apples that John bought.'
    d. *?[John-ga   sono ringo-o   katta-no]   Mary-ga   tabeta
          -NOM that   apple-ACC bought-GEN-ACC -NOM ate
      'Mary ate that apple that John bought.'

There is a third context in which the indefiniteness comstraint shows up, namely *tough*-movement constructions, as was noted by J. Higginbotham (p.c.):

(61) Mary met an / * the / *every easy man to please / * three easy men to please.

The fact that the indefiniteness constraints shows up in these three contexts suggest the following generalization: the indefiniteness constraint shows up in exactly those constructions in which an NP, in some way, has to replace a clause internal position which is bound by an operator.

Notes

[1] Lerner/Pinkal (1992) propose a semantic explanation of the indefiniteness requirement on attributive comparative constructions. They assume that the *than*-clause modifies the comparative NP (not the N'), unlike relative clauses. This requires a degree quantifier associated with the *than*-clause to take scope over the quantifier associated with the determiner of the NP. In their analysis, (47a) is represented as in (1a), and (48) (with *every*) as in (1b), where TALL is a relation between entities x and degrees d such that x is tall to the degree d.

(1) a. $\exists d'\exists x[TALL(x, d') \& MAN(x) \& ETR(x) \& \forall d[\exists y TALL(y, d) \& MAN(y, d) \& MSY(y) \rightarrow d'>d]]$

    b. $\exists d'\forall x[TALL(x, d') \& MAN(x) \& ETR(x) \& \forall d[\exists y[TALL(x, d) \& MAN(y, d) \& MSY(y) \rightarrow d'>d]]$

(1a) means that there is a degree d' of tallness that a man has that enters the room such that all degrees d of tallness that a man has that Mary saw yesterday are smaller than d'. (1b) present a vacuously true interpretation, since (1b) would be true if there is at least one degree of tallness that is so high that no man possesses it. This rules (48) (with *every*) as pragmatically deviant.

Thus, Lerner and Pinkal's analysis crucially rests on the fact that universal quantifiers do not carry a presupposition that there is an entity that satisfies the restriction. However, there are also quantifiers (if *every* in natural language isn't one itself) that carry an existential presupposition and are still ruled out in attributive comparative constructions, for example *at least one*, *both*, or *all three*:

(2) a. * At least one taller man than Mary saw yesterday entered the room.

b. * Both taller men / All three taller men than Mary saw yesterday entered the room.

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