

# The coordination-like structure of comparatives

## 1. Introduction\*

In the seventies, the main question concerning comparatives was whether they involve Wh-movement (Chomsky 1977; Den Besten 1978) or not (Bresnan 1975, 1976). Bresnan's evidence for the claim that comparatives do not involve Wh-movement, but rather deletion over a variable, was only slightly more convincing than Chomsky's evidence for the opposite, so the problem remained unsolved until Corver (1990) presented some more arguments supporting Bresnan's hypothesis. Once he had established that no Wh-movement rule can account for the subdeletion facts that can be observed in comparatives, Corver suggested (cf. Hankamer 1973; Huang 1977; Napoli 1983) that clausal comparatives are in fact coordination structures, because they can undergo operations like Gapping and Right Node Raising which are, thus far, strictly reserved for coordination structures.

In this paper I will argue that indeed no subordination is involved in clausal comparatives and that these comparatives observe the same conditions with respect to deletion and movement as coordinated sentences. However, clausal comparatives do not involve coordination of like sentences but, surprisingly, coordination of sentences which differ in both syntactic and semantic properties. This assumption has serious implications for our view of the way in which coordination-specific rules like Gapping and Right Node Raising act. We will touch upon this matter only briefly, though; the main topic of this paper will be the comparison between coordination and comparatives.

## 2. The similarity between comparatives and coordinated sentences

In this section the coordination-like character of comparatives will be discussed. We will show that comparatives behave very much like coordinated sentences and not like subordinated sentences. Comparatives can undergo Gapping and Right Node Raising; the subject of their second conjunct can be deleted through Conjunction Reduction; and finally, comparatives observe the Coordinate Structure Constraint, so movement in these constructions can take place only in an Across-the-board way.

Comparatives can be divided into clausal (1) and phrasal (2) constructions. We will consider only clausal comparatives here, however, because the situation with respect to phrasal comparatives seems to be different: some phrasal comparatives involve coordination (2b) and some subordination (2a, 2c) (Hankamer 1973; Napoli 1983).

- (1) a. John bought more books than Mary bought records
- b. The desk is as wide as it is high
- c. More women voted for the proposal than men voted against it

- (2) a. John is taller than Bill  
 b. The administrators are more stupid than malicious  
 c. No one has done more than John

It can easily be shown that the constituents in a clausal comparative following than or as constitute a sentence. For the sake of simplicity we will call the part of the sentence preceding than or as the first conjunct, and the part of the sentence following the comparative operator the second conjunct. No extraction can take place out of the second conjunct, as (3a) shows (Hankamer 1973). This can be explained by assuming that the fronted Wh-element is extracted out of a sentential island. Also, an antecedent in the first conjunct cannot bind an anaphor in the second conjunct, as Hoeksema (1983) points out. Because anaphors have to be bound within their local domain, the reflexive in (3b) must occur in another local domain than its only possible antecedent, no man.

- (3) a. \*Who<sub>i</sub> is John taller than t<sub>i</sub> is?  
 b. \*No man is stronger than himself is

Now that we have established that clausal comparatives consist of two clauses, the main problem concerns the way in which these two clauses are connected: in a coordinate or a subordinate way. We will try to solve this problem by comparing comparatives with coordinated and subordinated clauses. If the behaviour of comparatives in various constructions is largely identical to that of coordination structures, and different from the behaviour of subordination structures, the conclusion, that comparatives consist of two coordinated clauses, will be warranted. We will use the term 'deletion' to refer to the relation that exists between the full clause and its reduced clause. This does not mean, though, that a deletion operation, which operates on a full clause to yield a reduced one, is assumed. On the contrary, 'deletion' is meant purely as a descriptive term, not as a reduction operation; 'reduced' comparatives are assumed to be base-generated.

In both comparatives and coordinated sentences a variety of constituents can be deleted under identity with material in the other conjunct. This process is optional; however, it is subject to certain conditions, which appear to be the same for both constructions. Gapping is deletion of the finite verb of the second conjunct, and is only possible in coordinated structures (Huang 1977; Corver 1990). Gapping in a subordinate structure gives an ungrammatical result (the '\_' indicates the deletion site).

- (4) a. Mary kissed John and Sue \_\_ Bill  
 b. \*Mary kissed John when Sue \_\_ Bill  
 c. Mary kissed more boys than Sue \_\_ girls

Sentence (4c) shows that deletion of the finite verb is also possible in the second conjunct of comparatives. It can be shown that it is the same operation that is responsible for deletion of the finite verb in coordinated clauses as well as in comparatives, by comparing the conditions under which this rule applies in both constructions. A first condition on Gapping is, that it cannot apply whenever a clause intervenes between the first and the second conjunct. This condition is also observed by Gapping in comparatives, as pointed out by Huang (1977):

- (5) John wore the top hat and (\*I believe that) Marty \_\_ the suspenders  
 (6) Felix knows more Greek than (\*I believe that) Max \_\_ Latin

Huang also notes that if in coordinated clauses an object has to be deleted together with the verb, because the verb and its object constitute a complex verb, this object has to be deleted in comparatives as well.

- (7) John took advantage of Mary, and Mary \_\_\_ (\*advantage) of John  
 (8) John took more advantage of Mary, than Mary \_\_\_ (\*advantage) of John

The object advantage can not be left behind when the verb is deleted, because it is part of the complex verb to take advantage (of). Thirdly, when Gapping applies to a string of verbs, it cannot delete a verb unless all the verbs to its left are deleted too (Ross 1970).

- (9) I want to try to begin to write a novel and  
 a. Mary \_\_\_ to try to begin to write a play  
 b. Mary \_\_\_ \_\_\_ to begin to write a play  
 c. Mary \_\_\_ \_\_\_ to write a play  
 d. Mary \_\_\_ \_\_\_ a play  
 e. \*Mary wants \_\_\_ \_\_\_ a play  
 f. \*Mary wants \_\_\_ to begin \_\_\_ a play
- (10) I want to try to begin to grow more cauliflowers than  
 a. Mary \_\_\_ to try to begin to grow carrots  
 b. Mary \_\_\_ \_\_\_ to begin to grow carrots  
 c. Mary \_\_\_ \_\_\_ to grow carrots  
 d. Mary \_\_\_ \_\_\_ carrots  
 e. \*Mary wants \_\_\_ \_\_\_ carrots  
 f. \*Mary wants \_\_\_ to begin \_\_\_ carrots

The e)- and f)-sentences are ungrammatical under the intended reading. The examples (9) and (10) show that the deletion pattern in verb strings in coordinated clauses is similar to the pattern in comparatives (Huang 1977). Although 'discontinuous' or 'double' Gapping (Gapping which leaves behind two separate, noncontiguous gaps) is not possible in verb strings, it can sometimes occur in other configurations. The following sentences show that double Gapping is possible both in coordinated clauses and in comparatives:

- (11) Mary invited John to the party and Sue \_\_\_ Tanya \_\_\_  
 (12) Mary invited more boys to the party than Sue \_\_\_ girls \_\_\_

Another condition on Gapping is that it is blocked whenever the subject of the second conjunct cannot get emphatic stress. Dutch ze ('she') is the non-emphatic equivalent of zij. When ze is the subject of the second conjunct, Gapping can apply neither in a coordinated clause nor in a comparative one:

- (13) \*Marie speelt schaak en ze \_\_\_ backgammon  
 Mary plays chess and she (plays) backgammon  
 (14) \*Marie schrijft meer boeken dan ze toneelstukken \_\_\_  
 Mary writes more novels than she plays (writes)

The constituents which remain after Gapping has applied, are required to bear emphatic stress; this holds for coordinated clauses as well as for comparatives. This condition on intonation seems to be related to the contrast that must exist between the two conjuncts of a gapped coordinate structure (Jack Hoeksema, personal communication). The difference between the positions of the finite verb of the second conjunct in (13) and in (14) will be discussed in more detail in section 3. A fifth condition on Gapping is that when it applies in coordinated subordinate clauses, it is impossible to leave behind the complementizer dat in Dutch (Zwarts 1978). Comparatives containing the optional complementizer dat (the theoretical implication of this complementizer will be discussed in section 3), also do not permit Gapping.

- (15) Marie zei dat Jan een boek gekocht had en (\*dat) Piet een  
 plaat \_\_\_  
 Mary said that John a book bought had and (that) Pete a  
 record (bought had)

- (16) Jan had meer boeken gekocht dan (\*dat) Piet platen \_\_  
 John had more books bought than (that) Pete records (bought had)

Note that these sentences are also instances of double Gapping.

A final condition on Gapping in coordinated clauses, a condition which is also observed by comparatives, is the condition on parallel structures (Hankamer 1973; Huang 1977; Corver 1990). In several studies on Gapping it has been pointed out that Gapping is only allowed when both conjuncts have a 'parallel' structure. What exactly is meant by this parallelism is not quite clear, but the condition serves to rule out sentences like (17a).

- (17) a. \*Tom complains about the work load and Bill \_\_ incessantly  
 b. Tom complains about the work load and Bill \_\_ about the pay  
 (18) a. \*Tom complains more about the work load than Bill \_\_ incessantly  
 b. Tom complains more about the work load than Bill \_\_ about the pay

The same condition also rules out comparatives like the one in (18a). We will return to this condition on parallelism briefly in section 3. In the previous part we have shown that deletion of the verb in comparatives observes the same conditions as Gapping in coordinated clauses, whatever these conditions are. Therefore it is very likely that it is the same rule of Gapping that deletes the verb in comparatives and in coordinated clauses.

There is another deletion rule which can be argued to apply to coordinated clauses as well as to comparatives: Right Node Raising (RNR). Although in phrase structure grammars this rule was originally taken to be a movement rule ('raising' of the right node of all conjuncts, followed by deletion of all the raised elements except that of the last conjunct), we will use the term RNR only to refer to the construction itself and not to the raising operation, because several objections can be made against the raising-analysis of RNR-constructions (Zwarts 1986)<sup>1</sup>. When a right-peripheral string in the first conjunct is identical to a string in the same position in the second conjunct, RNR deletes the string in the first conjunct.

- (19) John hates \_\_ and Mary likes [books on modern painting]  
 (20) \*John bought \_\_ because Mary likes [books on modern painting]  
 (21) More men buy \_\_ than women borrow [books on modern painting]

RNR is possible in coordinated clauses like (19), but not in subordinated clauses, as can be seen in (20). (21) shows that RNR also can apply in comparatives (cf. Huang 1977; Corver 1990). One of the arguments against a raising-analysis for RNR-constructions, as Zwarts points out, is that RNR does not observe the traditional island conditions. For example, RNR is possible in a prepositional island:

- (22) We met men with \_\_ and we saw women without [pants]  
 (23) We met more men with \_\_ than we saw women without [pants]

RNR in a relative clause is also allowed in coordinated clauses as well as in comparatives:

- (24) Jack knows someone who buys \_\_ and Jill knows someone who sells [photographs of sandy beaches]  
 (25) Jack knows more girls who buy \_\_ than Jill knows boys who sell [photographs of sandy beaches]

A final deletion rule we will discuss, is Conjunction Reduction (CR)<sup>2</sup>. CR is often said to be responsible for deletion of the subject in sentences like the following:

- (26) Mary drinks vodka and \_\_ smokes cigars

Subordinated clauses do not allow deletion of their subjects. Comparatives on the other hand behave like coordinated clauses: deletion of the subject in the second conjunct is permitted. This is illustrated by the following examples:

- (27) \*Mary drinks vodka when \_\_ smokes cigars  
 (28) More women drink vodka than \_\_ smoke cigars

Comparatives also display the same movement effects as coordinate structures. Ross (1967) states in his Coordinate Structure Constraint (CSC) that '[i]n a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct'. This constraint blocks extraction of the Wh-element which actor from one of the conjuncts of the coordinate structure (29). A Wh-element also cannot be extracted from one of the conjuncts of a comparative, as (30) shows (Corver 1990):

- (29) a. John likes Sylvester Stallone and Mary hates Sylvester Stallone  
 b. \*Which actor<sub>i</sub> does John like t<sub>i</sub> and Mary hates Sylvester Stallone  
 (30) a. As many men like Sylvester Stallone as women hate Sylvester Stallone  
 b. \*Which actor<sub>i</sub> do as many men like t<sub>i</sub> as women hate Sylvester Stallone

However, extraction of constituents is possible, if it occurs in all conjuncts simultaneously (i.e. in an Across-the-board (ATB) way):

- (31) Which actor<sub>i</sub> does John like t<sub>i</sub> and Mary hate t<sub>i</sub>?  
 (32) Which actor<sub>i</sub> do as many men like t<sub>i</sub> as women hate t<sub>i</sub>?

Another constraint on movement in coordinate structures is that the second conjunct of a coordinate structure cannot be fronted without causing ungrammaticality. A subordinated clause on the other hand can be moved into sentence initial position without changing the acceptability of the sentence.

- (33) a. John bought two books and Mary bought three records  
 b. \*And Mary bought three records, John bought two books  
 (34) a. John got a lot of flowers because he was ill  
 b. Because John was ill, he got a lot of flowers

The second conjunct in a clausal comparative cannot be fronted either. When the than-clause is moved into sentence initial position, the result is always ungrammatical:

- (35) a. John bought more books than Mary bought records  
 b. \*Than Mary bought records, John bought more books

To summarize, in this section we have shown that clausal comparatives do not involve subordination, because they behave differently from subordinated sentences with respect to deletion and movement. Moreover, operations which are generally considered to apply to coordinate structures, like Gapping, RNR, CR and ATB movement, have been shown to apply to comparatives as well. So comparatives behave like coordination structures in many important ways. In the next section we will discuss some difficulties that arise from the assumption that comparatives consist of two coordinated clauses.

### 3. Differences between comparatives and coordinated clauses

As we have seen in the previous section, there is strong evidence to view

comparatives as the coordination of two clauses. In Dutch and German, however, two languages with a different word order in main (SVO) and subordinate (SOV) clause, we find counterarguments for this hypothesis. In these languages, the second conjunct of the comparative displays SOV word order, the underlying word order which is normally restricted to subordinate clauses.

- (36) Meer vrouwen stemden voor het voorstel dan mannen tegen het  
 voorstel stemden  
 more women voted for the proposal than men against the  
 proposal voted
- (37) Johann kaufte mehr Bücher als Maria Schallplatten kaufte  
 John bought more books than Mary records bought

Moreover, it is also possible to have a complementizer in initial position in the second conjunct.

- (38) Deze tafel is hoger dan (dat) hij breed is  
 this table is higher than (that) he wide is

Rayner and Banks (1990) also observe an optional complementizer in comparatives in Swedish:

- (39) Det var inte tyngre än att han kunde lyfta det  
 it was not heavier than that he could carry it

Except for the word order in the second conjunct, Dutch and German comparatives also differ from English comparatives in the acceptability of coordination specific rules. The following examples show that, although Gapping (40a) and ATB movement (40b) are permitted, RNR (40c) and CR (40d) are not.

- (40) a. Maria küsste mehr Jungen als Susan Mädchen \_\_ (cf. 4c)  
 Mary kissed more boys than Sue girls (kissed)
- b. Waar<sub>i</sub> heeft Jan evenveel boeken t<sub>i</sub> aan gegeven als Marie foto's  
 t<sub>i</sub> van heeft gekregen? (Corver 1990)  
 where has John as-many books to given as Mary pictures  
 from has got
- c. \*Meer mannen kopen \_\_ dan vrouwen \_\_ lenen [boeken over moderne  
 schilderkunst] (cf. 21)  
 more men buy than women borrow books on modern  
 painting
- d. \*Meer vrouwen drinken wodka dan \_\_ sigaren roken (cf. 28)  
 more women drink vodka than (women) cigars smoke

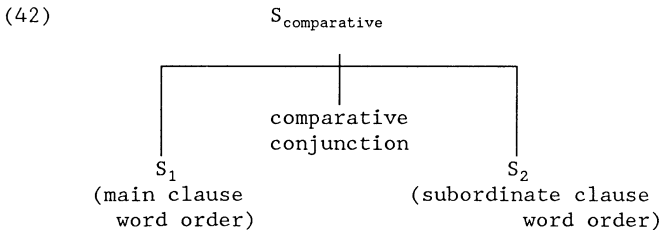
However, the unacceptability of (40c) and (40d) seems to be caused by the asymmetrical position of the finite verb in the two conjuncts rather than by a subordination relation between the two conjuncts. When these comparatives are embedded in a subordinated clause, the finite verb in the first conjunct appears in sentence final position, just like the verb in the second conjunct, and application of RNR and CR now gives a grammatical result:

- (41) a. Marie zei dat meer mannen een boek gaven \_\_ dan vrouwen een  
 plaat leenden [aan Jan]  
 Mary said that more men a book gave than women a  
 record lent to John
- b. Marie zei dat meer vrouwen wodka drinken dan \_\_ sigaren roken  
 Mary said that more women vodka drink than (women) cigars smoke

The observations above are a clear example of the different status of continuous deletion rules like RNR and CR, which leave behind a coordination of two continuous strings of the same lexical type (for

example drinks vodka and smokes cigars in (26)), and a discontinuous deletion rule like Gapping. Gapping causes coordination of strings of a different lexical type (Mary kissed John and Sue Bill in (4a), the latter being a discontinuous string). An identical position of the verb in all conjuncts is of importance only for the continuous deletion rules. Because of this distinction, an analogous treatment of continuous and discontinuous deletion rules does not seem either necessary or preferable.

Taking into account the differences between Dutch and German comparatives on the one hand, and English comparatives on the other, we claim that the relation between the two conjuncts in a comparative is still a coordinative one, but that the internal structure of the second conjunct is that of a subordinate clause. Although there is no hierarchical relation between the two conjuncts, they do not have the same internal structure. The first conjunct bears main clause word order and the second conjunct subordinate clause word order. In languages with no distinction between word order in main and subordinate clauses, this difference in structure will not be displayed in a different word order for the two conjuncts of the comparative. So the analysis of comparatives we propose is roughly the following:



Our claim has some serious implications for the definition of 'parallelism' of coordinated clauses. A rule like Gapping, which is restricted to coordinated sentences, is often claimed to operate on parallel structures only. Because the conjuncts of Dutch and German comparatives are not completely identical, a reformulation of this parallelism constraint is needed, which abstracts away from the differences between main and subordinate clauses. Because a reformulation of parallelism is beyond the scope of this paper, we will leave this matter for future research. In the remainder of this section some other characteristics of Dutch and English comparatives will be discussed, which are not found in coordinated sentences. As far as I can see, these differences between comparatives and coordinated sentences do not interfere with the structure of comparatives as proposed above, but rather enlarge the already existing asymmetry between the two conjuncts of a comparative, and therefore reduce the number of features that are of importance for establishing parallelism.

The main characteristic of comparatives is, that two elements are being compared<sup>3</sup>. These two compared elements can be noun phrases, adjective phrases or adverb phrases, and possibly also other elements. Deletion of the compared element in the first conjunct is never possible, even if deletion of the corresponding constituent in a coordinate structure would be, as the following sentences illustrate.

- (43) \*John bought \_\_\_ than Mary borrowed [books on modern painting]  
 (44) John bought \_\_\_ and Mary borrowed [books on modern painting]

In both sentences RNR has applied. The compared constituent more books on modern painting in the first conjunct of (43) cannot be omitted, whereas books on modern painting in the coordinate structure can. Deletion of the

compared constituent in the second conjunct, on the other hand, is possible, even if deletion of the corresponding constituent in a coordinated clause would be ruled out by the conditions stated for deletion in coordinate structures:

- (45) John bought more books than Mary bought \_\_\_  
 (46) \*John bought two books and Mary bought \_\_\_

The deletion operation in (45) is called Comparative Deletion, and is generally considered to apply to comparatives only.

Another characteristic of comparatives, which has been exhaustively discussed by Bresnan (1975, 1976), is the presence of an underlying quantifier in the compared element of the second conjunct. The most convincing argument in favour of this hypothesis is the impossibility of an overt quantifier in the position from which it is argued to have been deleted, although this quantifier is possible at similar positions in other constructions, like (48).

- (47) John bought more books than Mary bought (\*three) records  
 (48) John bought two books and Mary bought three records

See also Pinkham (1982) for evidence in French for this underlying Q. Whatever the proposed analysis for these sentences may be, deletion of Q over a variable (Bresnan 1975, 1976), Wh-movement of Q (Chomsky 1977), or Q-binding by COMP (Pinkham 1982), it seems that comparatives are always somewhat more complex than the corresponding coordinate structures. Presumably because of this operation on the quantifier, in complex constructions comparatives seem to get worse faster than the corresponding coordinations.

A final, semantic, distinction between comparatives and coordinated clauses can be observed with polarity. Hoeksema (1983) shows that negative polarity items, like Dutch ook maar, which can only occur in negative environments (in the scope of so-called 'anti-additive' functions), are perfectly acceptable when embedded in a clausal comparative:

- (49) Jan kocht meer boeken dan ook maar iemand platen kocht  
 John bought more books than at-all anybody records bought

Since the first conjunct of a clausal comparative is outside the scope of the anti-additive function [Adj-er than], ook maar is not allowed to occur here, unless some other anti-additive function takes scope over it. The same holds for all conjuncts of a coordinate structure.

- (50) a. \*Ook maar iemand kocht meer boeken dan Marie platen kocht  
           at-all anybody bought more books than Mary records bought  
       b. \*Jan kocht boeken en ook maar iemand kocht platen  
           John bought books and at-all anybody bought records

It is obvious that the differences between comparatives and coordinated sentences that have been discussed in the second half of this section, can not be attributed to a hierarchical relation between the two conjuncts of the comparative. It is rather the syntactic and semantic properties of the two compared constituents and the comparative operators as and than that seem to cause the observed asymmetry between the two conjuncts.

## 5. Conclusion

In this paper we have reached the following conclusions:

- I. Clausal comparatives do not involve subordination.



II. Operations that are specific for coordinate structures, like Gapping, Right Node Raising, Conjunction Reduction and Across-the-board movement, have been shown to be able to apply to clausal comparatives as well.

III. Because of the syntactic and semantic differences between the first and the second conjunct in comparatives, a parallelism requirement on Gapping based on structural identity or identity of representation is not tenable. Also, the parallelism required for Gapping must be of a different nature than the parallelism required for RNR and CR.

IV. Clausal comparatives are not only subject to operations and constraints that are specific for coordinate structures, but also to some other operations and conditions that seem to be imposed by the syntactic and semantic properties of the comparative construction itself.

#### Notes

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1. Zwarts (1986) also shows that a deletion analysis is not tenable for RNR-constructions. However, 'deletion' here is again meant as a descriptive term, and not as a syntactic operation.

2. There are some other deletion rules which can be argued to apply to both coordinated clauses and comparatives, like VP-deletion (i), Null Complement Anaphora (ii) and Pseudogapping (iii) (Napoli 1983). However, these rules can also operate on subordinated clauses, so they constitute neither evidence for nor evidence against a coordination-like structure of comparatives.

- (i) a. Mary drank vodka but Bill didn't \_\_
- b. Mary drank more vodka than Bill did \_\_
- c. Mary drank vodka because Bill did \_\_
- (ii) a. Mary said she bought a book but you don't think so
- b. Mary bought more books than you think \_\_
- c. Mary bought the book that you thought \_\_
- (iii) a. Mary drank vodka and Bill did \_\_ beer
- b. Mary drank more vodka than Bill did \_\_ beer
- c. Mary drank vodka when Bill did \_\_ beer

The a)-sentences involve coordination, the b)-sentences comparativization and the c)-sentences subordination.

3. Although the fact that comparatives can conjoin only two clauses seems to distinguish them from coordinate structures, which can contain several coordinated clauses, this is not the case. A coordinator like but also can not conjoin more than two sentences. Another similarity between than and but is the implicit negation they seem to contain. Seuren (1984) argues that the comparative operator than is negative in nature. Because but requires some kind of contrast between its conjuncts, and negation is not obligatory, but can also be said to contain an implicit negation.

- (i) John wanted to buy a book, but he bought a record

The contrast is between a situation in which John bought a book (the intended situation), and a situation in which he did not (the actual situation). Probably because of this implicit negation, the occurrence of too is highly restricted in clauses following but and than.

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