

# COORDINATION AND SYNTACTIC HIERARCHY\*

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*Abstract.* This article discusses the syntax of coordinate structures, in particular the status of initial coordinators, multiple coordination, and the asymmetries between conjuncts with respect to c-command relations. The idea of coordinators as heads – hence the CoP – is endorsed, but not for initial coordinators; rather they figure in a separate ‘distributive phrase’, which is transparently correlated to the (often ambiguous) semantics of the construction. Furthermore, it is argued that the lack of c-command between conjuncts is an instance of a broader effect, namely the ‘invisibility’ of paratactic material in general – and of second conjuncts in particular. Therefore, the grammar must have means to attach a paratactic constituent to the rest of the structure in a way that will eventually block c-command relations from the context. As this is not standardly available, we are led to define an operation called b-Merge, which induces a special type of inclusion relation, ‘behindance’. Thus, a modern revival of the 3D approach to coordination is brought about.

## **1. Introduction**

Coordinate structures give rise to symmetries as well as asymmetries. For example, conjuncts are paratactically construed, so in a sense they are on an equal level: a conjunct is not subordinated to another conjunct, and there is no detectable c-command relation between them (cf. Progovac 1998). Usually, conjuncts have the same syntactic and semantic function (Schachter 1977, Williams 1978), and DP conjuncts bear the same Case. Nevertheless, various asymmetries have been reported in the literature. These include coordination-internal constituency (Ross 1967), unbalanced Case (Johannessen 1998), first conjunct agreement with the finite verb (McCloskey 1986, Van Oirsouw 1987a), unbalanced categories and first conjunct selection (Sag et al. 1985). Section 4 discusses another class of asymmetries.

Some analyses stress the symmetry of coordination, e.g. by means of n-ary branching (Jackendoff 1977:50) or parallel structures (Goodall 1987); others stress the asymmetry by assuming right-adjunction of conjuncts (e.g. Munn 1993). It is easy to refute these ‘extreme’ views, but it is actually quite difficult to find the right balance. Several researchers have tried to explain the complex behavior of coordination on the basis of the following assumption: each conjunct is embedded in its own coordination phrase (CoP). The first Co then represents an

initial coordinator (sometimes called ‘initial conjunction’, ‘correlative conjunction’ or ‘correlative adverb’). This idea essentially goes back to Lakoff & Peters (1969), although a conjunction is not yet the head of a projection in the structure they propose. How the CoPs are combined is a matter of debate. In Progovac (1997) they are right-adjoined to an abstract DP; in Grootveld (1994) they are behind each other; in Van der Heijden (1999) they are embedded in an agreement phrase. However, I will argue that the original assumption is wrong: initial coordinators are not regular conjunctions (cf. Johannessen 1998/to appear, Bredschneijder 1999, Hendriks 2001/2004, Hendriks & Zwart 2001, and Skrabalova 2003). As a consequence, we will have to find another way to treat coordination with an initial coordinator. This is the subject of Section 2. What is more, we need to reconsider the structure of coordination as a whole. In Section 3 I will argue for a theory that uses the hierarchical organization of the CoP (cf. Munn 1987, Johannessen 1998) as well as the technique of 3D grammar, i.e. ‘behindance’ (cf. Goodall 1987, G. de Vries 1992, Moltmann 1992, Grootveld 1994, Mu’adz 1991, Van Riemsdijk 1998). Unlike these authors, I will treat behindance as firmly rooted in a binary branching Minimalist type of syntax (De Vries 2004). Section 4 discusses some asymmetries between conjuncts that follow from the present analysis, in which the second conjunct is ‘invisible’ in terms of c-command. Section 5 relates this property to paratactic constructions in general. Section 6 is the conclusion.

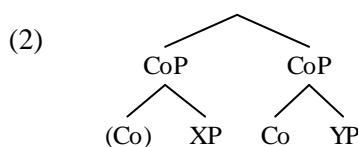
## 2. Coordination with an initial coordinator

### 2.1 *Initial coordinators are not conjunctions*

Some examples of coordination with an initial coordinator in Dutch are given in (1):

- (1) a. Hij is *en* slim *en* knap. [Dutch]  
       he is both smart and handsome
- b. Je moet kiezen: *of(wel)* dit, *of(wel)* dat.  
       you must choose: either this or that
- c. Hij is *zowel* voorzitter *als* penningmeester.  
       he is both chairman and treasurer
- d. Hij is *noch* snel, *noch* precies.  
       he is neither fast, nor meticulous
- e. Hij is *niet alleen* goedgekleed, *maar ook* rijk.  
       he is not only well-dressed, but also rich

As stated in the introduction, the assumption that an initial coordinator is a regular conjunction is a premise which underlies the view that each conjunct is in its own coordination phrase.<sup>1</sup> This view is schematically represented in (2):



However, (2) cannot be maintained because the premise is wrong. I will show this by simply listing the differences between initial coordinators and conjunctions.

First note that an initial coordinator sometimes has a form which differs from the conjunction. Examples are *neither... nor*; *both... and*. Second, in the case of triple, quadruple, etc. coordination, it is the conjunction that is repeated, not the initial coordinator:

- (3) a. He is neither smart *nor* handsome *nor* rich.  
 b. Ik zag zowel Joop *als* Jaap *als* Joep *als* Job. [Dutch]  
 I saw INICO Joop and Jaap and Joep and Job

This suggests that the initial coordinator has a status which differs from the regular conjunction's. Third, a conjunction is intuitively bivalent (there are two conjuncts), but an initial coordinator is monovalent: it takes scope over the coordination as a whole; see below for details. Fourth, an initial coordinator always triggers focus, whereas a conjunction is neutral in this respect (but of course there can be optional stress). See Hendriks (2004) and Johannessen (to appear) for extensive discussion; see also below. Fifth, a conjunction directly precedes the second (third, etc.) conjunct, but initial coordinators can sometimes be found in an unexpected position – that is, not directly preceding the first conjunct – namely (i) higher up in the clause,<sup>2</sup> (ii) inside the first conjunct,<sup>3</sup> or (iii) directly preceding the conjunction. This is illustrated in Dutch in (4) through (6), respectively:

- (4) a. *Noch* heeft hij gezegd [dat ze moet blijven], *noch* [dat ze weg moet gaan]. [Dutch]  
 neither has he said that she has to stay, nor that she away has to go  
 b. Hij zal *ofwel* zeggen [dat ze moet blijven], *ofwel* [dat ze weg moet gaan].  
 he will either say that Marie has to stay, or that she away has to go

- (5) a. [Joop leest *en* een boek] *en* [hij schrijft een brief].  
Joop reads and a book, and he writes a letter
- b. [*Niet alleen* is Joop zeer rijk], *maar* [hij gaat *ook* goed gekleed].  
not only is Joop very rich, but he is also well-dressed
- c. ? [*Ofwel* leest Joop een boek], *of* [hij schrijft een brief].  
either reads Joop a book, or he writes a letter
- (6) a. Hij leest [boeken] *zowel als* [tijdschriften].  
he reads books as well as magazines
- b. Joop houdt [van macaroni] *evenmin als* [van spaghetti].  
Joop likes macaroni as little as spaghetti

Notably, whether these options are available depends on the particular initial coordinator and the context.

Last but not least, an initial coordinator triggers an obligatory distributive reading (see also Progovac 1999/2001, contra Tsohatzidis 2001).<sup>4</sup> This is illustrated in (7):

- (7) a. Bill and Anna are going to be married. (one or two weddings)
- b. Both Bill and Anna are going to be married. (two weddings)

In (7b) the possibility of a collective reading is absent. I will come back to the issue of distributivity in the next section.

If initial coordinators are not conjunctions, what are they? Hendriks (2001/2004) and Johannessen (to appear) show that there are striking similarities with focus particles such as *only*. For instance, they must c-command a focused phrase, which is stressed:

- (8) a. Either JANE will eat the rice or JOHN (will eat the rice). [Hendriks, 2004: 3]
- b. \* JANE will either eat the rice or JOHN (will eat the rice).
- (9) a. Only JANE ate rice. [Johannessen, to appear: 7]
- b. \* JANE only ate rice.

I cannot repeat all the arguments here, but we can conclude the following, notwithstanding the fact that some initial coordinators are homophonous with normal conjunctions:

- (10) *An initial coordinator is a distributive focus particle.*

Let us turn to the syntax of the constructions at hand. Johannessen (to appear) states that there must be a local relation between an initial coordinator and the conjunction, since there is a clear dependency between the two: each initial coordinator selects a particular conjunction. She assumes that initial coordinators are adverbial phrases that are normally left-adjoined to a coordination phrase, schematically [<sub>CoP</sub> [<sub>AdvP</sub> IniCo] [<sub>CoP</sub> XP Co YP]] (my notation). However, selection is normally expressed by a head-complement relation. Furthermore, we have to consider the possibility that not all initial coordinators are equal. Recall that there are differences with respect to the surface positions illustrated in (4-6). Moreover, some initial coordinators are clearly XPs, e.g. *not only*, others may be heads (cf. Progovac 1997). For instance, Skrabalova (2003) argues that French initial *et* and Czech *i* are distributive heads. Thus assume, following Skrabalova, that there is a functional projection DistP on top of CoP. (The coordination phrase itself will be discussed in Section 3.) Furthermore, assume that SpecDistP can host an adverbial phrase:

(11) [<sub>DistP</sub> (AdvP) [<sub>Dist'</sub> Dist [<sub>CoP</sub> XP [<sub>Co'</sub> Co YP]]]]

Some initial coordinators are simply the head Dist. Others are AdvPs, which normally surface in SpecDistP. CoP is selected by Dist, which is in a spec-head relation with AdvP.

Let us assume that every coordinate structure has DistP as its maximal projection, for the simple reason that every coordination is interpreted either collectively or distributively. Now there are two possible situations. First, if either Dist or SpecDistP is filled, the coordination is interpreted as obligatorily [+distributive]; this is the case if there is an initial coordinator, for instance in (7b). Second, if there is no initial coordinator, Dist or SpecDistP is lexically empty; therefore, the coordination is lexically underspecified for distributivity, hence ambiguous – that is, it is interpreted as either [+distributive] or [-distributive], which is [+collective]; this is the situation in (7a). I suppose that the feature [+/- distributive] resides in the head Dist. The next section discusses grouping and distributivity in multiple coordination structures.

Depending on the stress pattern, the adverbial phrase in (11) can also be generated inside the first conjunct XP; this gives the situation in (5). We may assume that in such a case AdvP covertly moves to its regular position in SpecDistP; this is comparable to the analysis in Johannessen (to appear). If adjunction to the Co'-level is allowed, the pattern in (6) can be treated in a similar way. Concerning (4), we can either assume that AdvP moves to a higher projection (Johannessen, to appear) or that the conjuncts are larger than indicated and that there is gapping in the second conjunct (Schwarz 1999); see footnote 2. I will leave this matter open.

## 2.2 Multiple coordination and distributivity

In a multiple coordinate structure, all but the last connection are usually asyndetic, for example in the triplet in (12):

(12) A, B Co C

Although the ‘comma’ in (12) means Co, e.g. *and*, (12) is not necessarily equivalent to (13).

(13) A Co B Co C

Both (12) and (13) can be interpreted either collectively or distributively, but (13) can have additional readings, which are the result of subgroups. (Of course, these are often made explicit by the intonation pattern.) This is indicated in (14):

(14) a. (A Co<sub>1</sub> B Co<sub>2</sub> C)      where Co<sub>2</sub> = Co<sub>1</sub>  
b. ((A Co<sub>1</sub> B) Co<sub>2</sub> C)  
c. (A Co<sub>1</sub> (B Co<sub>2</sub> C))

With respect to each grouping, [+/- distributive] applies (see below for details). For (12) only the first possibility in (14a) is available. In (14b/c) Co<sub>2</sub> may but need not equal Co<sub>1</sub>. Grouping can be forced by using different coordinators. Even a phonological difference suffices:

(15) a. A and B or C      =      ((A and B) or C)    *or*    (A and (B or C))  
b. A and B 'n' C      =      (A and (B 'n' C))

Another way to force grouping is the use of an initial coordinator:

(16) A and both B and C      =      A and (both (B and C))

An initial coordinator normally precedes a group or subgroup. (As we have seen, it sometimes surfaces within the first member of a group.) Of course, if an initial coordinator is attached to the first group, we create potential ambiguities; see (17):



**Table 1. Possible readings of A Co B Co C.**

reading no	(A Co B Co C)	((A Co B) Co C)	(A Co (B Co C))
1	A,B,C	≡ (A,B),C	≡ A,(B,C)
2	A+B+C	≡ (A+B)+C	≡ A+(B+C)
3		(A+B),C	
4		(A,B)+C	
5			A,(B+C)
6			A+(B,C)

An illustration is given in (20).

- (20) a. Joop, Jaap and Joep lifted the box.  
 b. Joop and Jaap and Joep lifted the box.

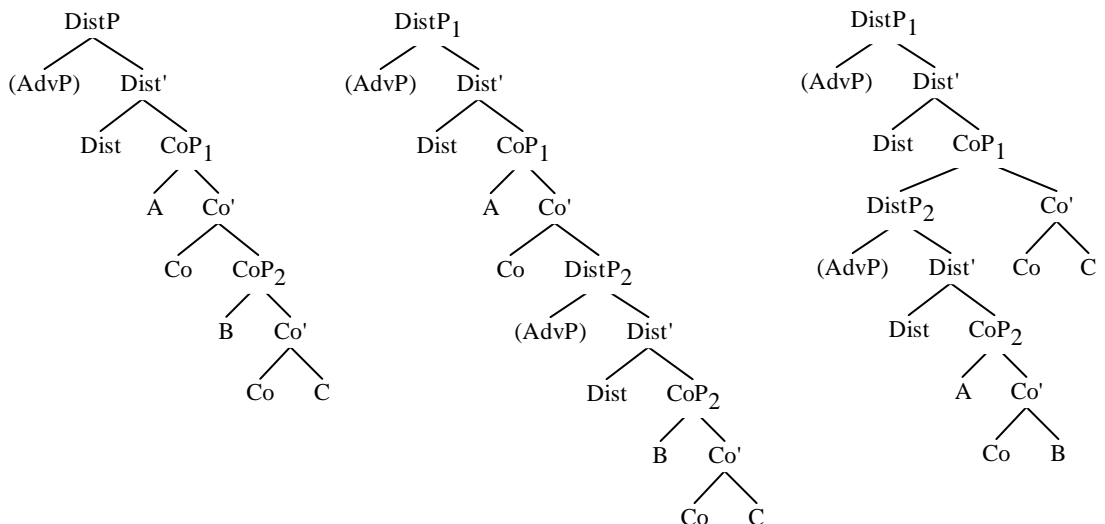
The sentence in (20a) means that either the three persons lifted the box together, or each does so separately. In (20b) there are additional readings, depending on the bracketing. For instance, a possible reading is that Joop and Jaap lifted the box together, and Joep on his own.

From the above we can conclude that grouping has an effect on the scope of distributivity/collectivity. In concurrence with the conclusions from the previous section, I propose to treat grouping and distributivity in tandem:

- (21) *A subgroup in a multiple coordinate structure is singled out by a distributive projection.*

Thus, in a triplet we have three possible cases:<sup>5</sup>

- (22) a. (A Co B Co C)                      b. (A Co (B Co C))                      c. ((A Co B) Co C)





Since the head *Dist* has two values, plus or minus, the structure in (22a) represents the fact that there are two readings: A, B and C are treated either collectively or distributively. In (22b) there is a subgroup, and there are two *Dist* heads. The first head [+/-]distributes over the first conjunct and the subgroup that includes B and C; the second [+/-]distributes within the subgroup. Therefore there are four possible readings, two of which coincide with (22a); see the third column in Table 1. In (22c) the situation is equally complex, but reversed; see the last column in Table 1.

The structures in (22b/c) show that there can be an initial coordinator (whether it is an adverbial phrase or a head) that precedes a subgroup, but is actually in the middle of a complex coordination, as in (23) or (24):

- (23) a. both Jaap and (*either* Joop or Joep)  
 b. either (*both* Joop and Joep) or Jaap

- (24) Jaap en (*of* Mini of Maxi) [Dutch]  
 Jaap and either Mini or Maxi

Finally, consider the fact that in a non-divided group the non-lowest conjunctions are either silent or equal to the lowest conjunction:

- (25) a. Joop, Joep, Job and Jaap  
 b. Joop and Joep and Job and Jaap  
 c. Joop 'n' Joep 'n' Job 'n' Jaap

This suggests that the different *Co* heads in the structure in (22a) are connected. As a matter of fact, Zoerner (1995, 1999) proposes that there is (covert) head movement between conjunctions.<sup>6</sup> Normally, the lowest copy is pronounced, but apparently pronunciation of all copies is also allowed. If the basic idea of head or feature movement between conjunctions is correct, the Head Movement Constraint tells us that *Co* cannot cross a distributive head; so if there is a subgroup, this group must contain an independent *Co*, which, therefore, may differ from the other *Co* or chain of *Cos*; this is the situation in (22b/c).

### 3. A 3D plus CoP approach to coordination

Many authors have argued that a conjunction acts as a functional head (e.g. Munn 1987, Rothstein 1991, Grootveld 1994, Johannessen 1998, Van der Heijden 1999), which leads to the coordination phrase (“CoP”, “ConjP”, ...), within which the conjuncts are arguments – but how exactly is subject to debate. This finding solves a number of problems.<sup>7</sup> First, the status of the conjunction was very unclear in a multi-headedness approach to coordination (  $XP \rightarrow XP$  (conj  $XP$ )<sup>\*</sup> ) as well as a parallel structures theory (Goodall 1987). By contrast, the conjunction is a functional head in the CoP approach. Furthermore, the CoP is compatible with X'-theory, in which there can only be one head. Third, CoP constitutes the node on top of the conjuncts, which is necessary because the coordination as a whole can have features that are not present in any of the separate conjuncts. A simple example is the fact that *John and Pete* is plural. Finally, the CoP enables us to deal with asymmetries, since there can be an internal hierarchy.

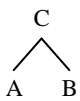
In the previous section I have argued for a hierarchical organization of the coordination phrase; I have used CoP as well as DistP to account for the more complex cases. But this cannot be the whole story. How can we represent the intuitive symmetry of coordination, and in particular, how can we prevent the first conjunct from c-commanding the second? This last fact is illustrated in (26a) by an attempt to move a DP from the second conjunct and make it the first conjunct, which is unacceptable. In (26b) the first conjunct tries to bind into the second conjunct; this is also unacceptable. See Progovac (1998), De Vries (2004) and the references there for more discussion.<sup>8</sup>

- (26) a. \* Which man and a friend of \_ are both handsome?  
b. \* Joop<sub>i</sub> en (een foto van) zichzelf<sub>i</sub> [Dutch]  
    Joop<sub>i</sub> and (a picture of) SE-SELF<sub>i</sub>  
    ‘Joop<sub>i</sub> and (a picture of) himself<sub>i</sub>’

I propose to account for the symmetry of coordination by means of the relation *behindance*. A spacial metaphor is that conjuncts are behind each other in a three-dimensional structure. As I have mentioned in the introduction, the idea of parallel structures has been expressed before in Goodall (1987), Mu'adz (1991), Moltmann (1992), Grootveld (1994), Van Riemsdijk (1998) and others. Unlike Goodall and his successors, Grootveld correctly argues that we have to maintain the CoP. Grootveld's theory, however, is based on two assumptions with which I disagree: (i) the idea that each conjunct is in its own CoP (see Section 2); and (ii) ternary branching in case the behindance relation is invoked.

In De Vries (2004) I define a ‘three-dimensional’ grammar in Minimalist terms.<sup>9</sup> The basic idea is that there are two types of Merge, one based on dominance (d-Merge), one based on behindance (b-Merge).<sup>10</sup> The ‘normal’ d-Merge is defined in different, arbitrary notations in (27):

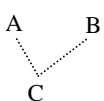
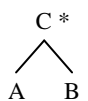
(27) d-Merge (A,B) → C

- |    |   |    |                       |    |  |
|----|---|----|-----------------------|----|--|
| a. |  | b. | [ <sub>C</sub> A, B ] | c. | A precedes B<br>C dominates A<br>C dominates B |
|----|---|----|-----------------------|----|--|

If A and B are Merged, they are combined as an ordered pair <A,B>. The asymmetrical nature of Merge (this is the abstract precedence relation) is also argued for in Koster (1999, 2000b), Zwart (1999, 2003) and Langendoen (2003), contra Chomsky (1995).<sup>11</sup> The combination of A and B – for ease of reference called C in (27), but the label is probably predictable – includes and therefore dominates A and B.

The third basic relation (next to dominance and precedence) is behindance. I have argued that behindance is in fact a special type of inclusion that blocks c-command. Consequently, b-Merge is defined as follows, in different notations:

(28) b-Merge (A,B) → C

- |    |   |    |   |    |                       |    |  |
|----|---|----|---|----|-----------------------|----|--|
| a. |  | b. |  | c. | < <sub>C</sub> A, B > | d. | A precedes B<br>A is behind C<br>B is behind C |
|----|---|----|---|----|-----------------------|----|--|

As in (27), A precedes B and C includes both A and B, but now there is a different type of hierarchy. In (28a) the dotted lines are meant to suggest a 3D drawing, so that A and B are behind C; in (28b) the different type of hierarchy is indicated by the star next to the top node C, in (28c) it is indicated by the use angle brackets instead of square brackets; (28d) directly lists the local relations.

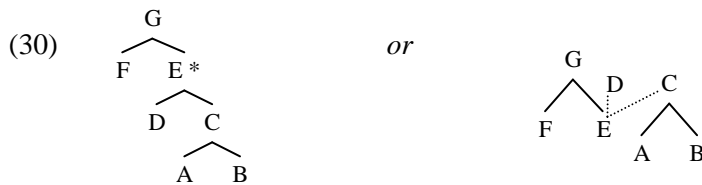
Dominance is equivalent to what I call ‘d-inclusion’, behindance to ‘b-inclusion’. Building on Epstein (1999), I define c-command as follows:

(29) *C-command*

If Merge(A,B) then A c-commands B and all the constituents d-included in B.

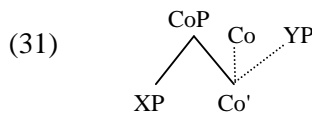
Inclusion is a transitive relation; if A (x-)includes B and B (x-)includes C, then A (x-)includes C. The c-command relation is total; A c-commands B and everything d-included in B. In a ‘normal’ structure, which is derived by d-Merge only, c-command involves the whole structure (at a particular point of the derivation). Notice that (29) does not refer to any particular type of Merge.

As an illustration, consider the following structure, which is created by the subsequent operations  $d\text{-Merge}(A,B)\rightarrow C$ ,  $b\text{-Merge}(D,C)\rightarrow E$ , and  $d\text{-Merge}(F,E)\rightarrow G$ .



According to (29), A c-commands B; D c-commands C, A and B (because A and B are d-included in C); and F c-commands E, but nothing else, because D and C are not d-included in E. The last fact is exactly what we need. In (30) the normal dominance hierarchy is interrupted at point E, hence the constituents of E are in a ‘paratactic’ relation to the higher nodes.

Now let us return to coordination. How can we conjoin XP and YP with the use of a CoP, but without creating a c-command relation between XP and YP? The simplest solution in terms of the theory outlined above is the following derivation:  $b\text{-Merge}(\text{Co},\text{YP})\rightarrow\text{Co}'$ ,  $d\text{-Merge}(\text{Co}',\text{XP})\rightarrow\text{CoP}$ ; see (31):<sup>12</sup>

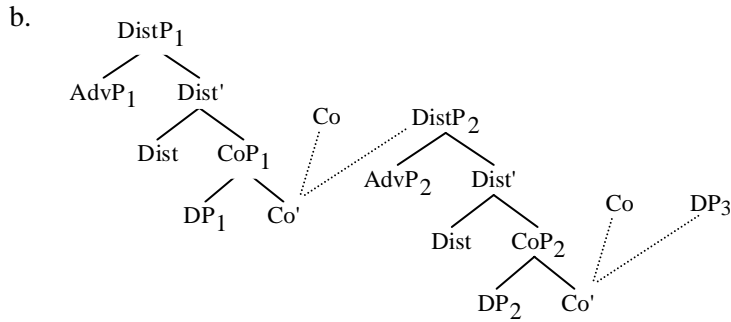


In (31) Co and YP are ‘behind’ (i.e. b-included in) Co’; therefore they are not c-commanded by XP, according to the definition of c-command in (29).<sup>13</sup>

Usually (but not necessarily), XP and YP are of the same category. CoP has no fixed category, and it behaves like its arguments.<sup>14</sup> CoP is a constituent containing XP, Co and YP, and CoP as a whole can be moved. Furthermore, Co and YP form a constituent, but XP and Co do not (this is the Ross asymmetry). In the next section I will discuss the paratactic nature of the second conjunct.

Let me finish this section by showing the structure for a complicated coordination according to the theory proposed here. Example (23a) is repeated in (32a). The structure, which is a revision of (22b), is given in (32b) in tree notation and in (32c) in set notation.

(32) a. both Jaap and (either Joop or Joep)



c.  $[\text{DistP}_1 \text{ AdvP}_1, [\text{Dist}' \text{ Dist}, [\text{CoP}_1 \text{ DP}_1, <\text{Co}' \text{ Co}, [\text{DistP}_2 \text{ AdvP}_2, [\text{Dist}' \text{ Dist}, [\text{CoP}_2 \text{ DP}_2, <\text{Co}' \text{ Co}, \text{DP}_3>]]]]>]]]$

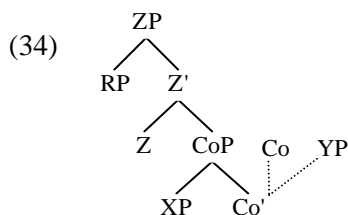
Here, AdvP<sub>1</sub> is *both*, DP<sub>1</sub> *Jaap*, Co<sub>1</sub> *and*, AdvP<sub>2</sub> *either*, DP<sub>2</sub> *Joop*, Co<sub>2</sub> *or*, and DP<sub>3</sub> *Joep*. The structure is straightforwardly derived as follows: b-Merge(Co<sub>2</sub>, DP<sub>3</sub>) → Co'<sub>2</sub>, d-Merge(DP<sub>2</sub>, Co'<sub>2</sub>) → CoP<sub>2</sub>, d-Merge(Dist<sub>2</sub>, CoP<sub>2</sub>) → Dist'<sub>2</sub>, d-Merge(AdvP<sub>2</sub>, Dist'<sub>2</sub>) → DistP<sub>2</sub>, b-Merge(Co<sub>1</sub>, DistP<sub>2</sub>) → Co'<sub>1</sub>, d-Merge(DP<sub>1</sub>, Co'<sub>1</sub>) → CoP<sub>1</sub>, d-Merge(Dist<sub>1</sub>, CoP<sub>1</sub>) → Dist'<sub>1</sub>, d-Merge(AdvP<sub>1</sub>, Dist'<sub>1</sub>) → DistP<sub>1</sub>. The dominance line is interrupted at Co'<sub>1</sub>, so DP<sub>1</sub> does not c-command into DistP<sub>2</sub>. Within DistP<sub>2</sub>, the dominance line is interrupted at Co'<sub>2</sub>, so DP<sub>2</sub> does not c-command DP<sub>3</sub>, as required. The structures in (22a) and (22c) are to be revised similarly. Using the star notation of behindance (28b), one can simply put a star next to each Co'.

#### 4. The invisibility of the second conjunct

The theory outlined above predicts a class of asymmetries that, as far as I know, has not been noticed before:

(33) *A second conjunct, as opposed to the first, is invisible for the context, in terms of c-command.*

To see this, consider (34):



According to the definition of c-command in (29), the first conjunct, XP, is c-commanded by RP, some phrase higher up in the syntactic context of the coordination phrase. The line of reasoning is that XP is d-included in CoP and CoP is d-included in Z' and RP is Merged with Z'. As discussed before, YP is not c-commanded by XP because it is not d-included in Co', the sister of XP. For the same reason, YP is also not c-commanded by RP (although Co' itself is d-included in CoP and CoP in Z'); in other words, the line of dominance from Z' to YP is broken at Co'. The conclusion is, that – in terms of c-command – the first conjunct is visible for the context, but the second is not.

This asymmetry shows itself in several ways. First consider movement. Usually, movement out of a conjunct is impossible; this follows from the Coordinate Structure Constraint (Ross 1967):<sup>15</sup>

- (35) a. \* What did you buy \_ and sell a book?  
 b. \* What did you buy a book and sell \_ ?

However, it has become clear that the CSC does not apply to semantically asymmetrical coordination (cf. Goldsmith 1985, Culicover & Jackendoff 1997, Van der Heijden 1999). Some examples in which a constituent is raised from the first conjunct are shown in (36) and (37):<sup>16</sup>

(36) How much can you drink \_ and still stay sober?

- (37) a. Hoeveel chocola denk je dat je kunt \_ eten en toch niet misselijk worden? [Dutch]  
 how much chocolate think you that you can eat and still not sick get  
 'How much chocolate do you think you can eat \_ and still not get sick?'  
 b. Hoe lang kun je op een dag \_ studeren en daarbij toch vrolijk blijven?  
 how long can you on one day study and thereby still cheerful stay  
 'How long are you able to study \_ on one day and still stay cheerful?'  
 c. Wie zei je dat er \_ nog niet vertrokken was of Joop kocht een duur cadeau?  
 who said you that there not yet left was or Joop bought an expensive gift  
 'Who did you say \_ had barely left before Joop bought an expensive gift?'  
 d. Wat had Joopje nog niet \_ gekregen of hij begon ermee te gooien?  
 what had Joopje not yet got or he started therewith to throw  
 'What did Joopje just receive and he already started demolishing it?'

Interestingly, movement from the second conjunct in similar sentences is completely impossible. This is shown in (38) and (39):<sup>17</sup>

(38) \* What did Joop finally overcome his inhibitions and ask Jaap \_ ?

(39) a. \* Wat kun je een pond chocola eten en toch niet \_ worden? [Dutch]

what can you a pound of chocolate eat and still not become

‘What can you eat a pound of chocolate and still not become \_ ?’

b. \* Wat kun je op een dag zes uur studeren en toch \_ blijven?

what can you on one day six hours study and still stay

‘What can you study for six hours on one day and still stay \_ ?’

c. \* Wie was Joop nog niet vertrokken of \_ kocht een duur cadeau?

who had Joop still not left or bought an expensive gift

‘Who had Joop barely left before \_ bought an expensive gift?’

d. \* Wat was Joop nog niet vertrokken of Jaap heeft \_ gekocht?

what had Joop still not left or Jaap has bought

‘What had Joop still not left before Jaap bought \_ ?’

Since movement is always to a c-commanding position, the contrast between (36/37) and (38/39) follows from the structure for coordination proposed above.

The asymmetry between conjuncts can also be illustrated by the Binding Theory, which is dependent on c-command. I will do so by exploiting the difference between the local anaphor *zichzelf* and the complex pronoun *hemzelf* in Dutch.<sup>18</sup> Both can be translated as ‘himself’ in English. *Hemzelf* is an ‘identifying emphatic expression’ (see De Vries 1999), which consists of a pronominal part *hem* ‘him’, which is subject to Condition B, and an emphatic part *zelf*, comparable to ‘himself’ in the English construction ‘John himself’. *Hemzelf* is not a local anaphor, contrary to *zichzelf* (or the ambiguous *himself* in English); this is shown in (40):<sup>19</sup>

(40) Joop<sub>i</sub> beloonde zichzelf<sub>i</sub> / \*hemzelf<sub>i</sub>. [Dutch]

‘Joop rewarded himself.’

Now consider the following contrast:

- (41) a. \* Joop<sub>i</sub> beloonde hemzelf<sub>i</sub> en Anna rijkelijk.  
 Joop awarded PRON-SELF and Anna richly  
 ‘Joop richly awarded himself and Anna.’  
 b. Joop<sub>i</sub> beloonde Anna en hemzelf<sub>i</sub> rijkelijk.

If *hemzelf* is the first conjunct (41a), the sentence is excluded by Condition B as in (40). If, however, *hemzelf* is the second conjunct (41b), the sentence is acceptable.<sup>20</sup> This again suggests that a first conjunct is visible for a c-commanding phrase in the context (here the subject *Joop*), but the second conjunct is not.

At first sight, we would expect that the local anaphor *zichzelf* gives the opposite pattern. This, however, is not completely true; see (42):

- (42) a. Joop<sub>i</sub> beloonde zichzelf<sub>i</sub> en Anna rijkelijk. [Dutch]  
 Joop awarded SE-SELF and Anna richly  
 ‘Joop richly awarded himself and Anna.’  
 b. Joop<sub>i</sub> beloonde Anna en zichzelf<sub>i</sub> rijkelijk.

As expected, (42a) contrasts with (41a). Why then is (42b) acceptable (although I have a preference for (42a)) if the second conjunct is ‘invisible’? The reason is simple: although (42b) is excluded if we use DP coordination, it has a possible analysis in terms of CP coordination, with forward ellipsis:

- (43) [Joop beloonde Anna] en [~~Joop<sub>i</sub> beloonde~~ zichzelf<sub>i</sub>]

In (43) *zichzelf* can be locally bound within the second conjunct. Thus, we explain the complementary distribution between anaphors and pronouns in a first conjunct, and the overlapping distribution in a second conjunct.<sup>21</sup>

The possibility of an anaphor in a second conjunct disappears if a CP analysis is semantically impossible, for instance in the ECM constructions in (44) and (45).

- (44) a. Op TV zag Agassi<sub>i</sub> zichzelf<sub>i</sub> en Sampras een tenniswedstrijd tegen elkaar spelen.  
 on TV saw Agassi SE-SELF and Sampras a tennis game against each other play  
 ‘On TV, Agassi saw himself and Sampras play a tennis game against each other.’  
 b. ?\* Op TV zag Agassi<sub>i</sub> Sampras en zichzelf<sub>i</sub> een tenniswedstrijd tegen elkaar spelen.



- (45) a. Na de eerste zangles hoorde Joop<sub>i</sub> in gedachten zichzelf<sub>i</sub> en Pavarotti al een duet  
after the first singing lesson heard Joop in his mind SE-SELF and Pavarotti already a duet  
zingen.  
sing  
'After his first singing lesson, Joop already heard himself and Pavarotti sing a duet in his  
mind.'
- b. ?\* Na de eerste zangles hoorde Joop<sub>i</sub> in gedachten Pavarotti en zichzelf<sub>i</sub> al een duet  
zingen.

In the b-examples, the use of *hemzelf* instead of *zichzelf* makes the sentence acceptable.<sup>22</sup>

In sum, there is evidence that – as for c-command relations – a second conjunct is invisible for the context, in contrast to the first. This conclusion will be corroborated in the following section.

## 5. Further consequences: parataxis in general

Normal coordination is just one instance of a broad collection of constructions that can be captured under the name parataxis. My general claim, put forward in its present form in De Vries (2004), is that all (and only) instances of parataxis involve b-Merge (as explained in Section 3). Put in more expressive terms, paratactic material is 'behind' the rest of the structure. Therefore, like second conjuncts, other paratactic constituents are shielded from the matrix, in the sense that they are invisible for c-command relations. In practice, this means the following:

- (46) *If A is paratactically construed with respect to B, no constituent from A can move to B, or be anaphorically dependent on some constituent in B.*

This is illustrated for parenthetical clauses in (47) and (48), where variable binding (which normally depends on c-command) and movement fail completely:

- (47) \* Everybody<sub>i</sub> – and he<sub>i</sub> just arrived – was talking about Hank.
- (48) a. \* Who did Hank – (and) \_ hate(s) to tell her this – steal/stole Lisa's bike ?  
b. \* What did Lisa – (and) you know Hank steal/stole \_ – grumble(d) all day long ?

Notice also the following minimal pair of sentences with relative clauses:

- (49) a. Everybody<sub>i</sub> was talking about the museum that he<sub>i</sub> visited yesterday.  
 b. \* Everybody<sub>i</sub> was talking about the Louvre, which he<sub>i</sub> visited yesterday.

The restrictive relative in (49a) is hierarchically embedded in the main structure, and variable binding into the relative clause is possible. The appositive relative (49b) is set apart somehow, and the c-command relation is precluded; see also Demirdache (1991) for this kind of facts. Several authors have suggested that nonrestrictive relatives are in some sense paratactic, but how exactly is a matter of dispute. It seems clear to me that an appositive is not related to the matrix clause as a whole, but only to the antecedent. Therefore, based on Koster (2000a), I have claimed that appositives are coordinated to the antecedent in De Vries (2002a). Surely, this is a special type of coordination, called specifying coordination. This construction is also needed for appositions, where the optional presence of a conjunction indicates that we are indeed dealing with coordination, as was already pointed out in Kraak & Klooster (1968):

- (50) a. the White House, *or* the house with the Oval Office  
 b. (Fik is) een hond, *en wel* een poedel. [Dutch]  
 ‘(Fik is) a dog, namely a poodle.’

Appositions show the tight relationship between coordination and parenthesis. The possibility of a conjunction at the beginning of a parenthetical clause – cf. (47/48) above – does so, too; in these cases we have ‘monovalent coordination’.<sup>23</sup> Thus, parataxis in general does not only mean b-Merge – hence the start of a new c-command domain – but it also implies coordination of some sort.

## 6. Conclusion

Coordinate structures are asymmetrical, yet they cannot be hypotactically construed; in other words,  $X \text{ co } Y$  clearly differs from  $X \text{ sub } Y$ . An example of this anti-asymmetry is the lack of c-command relations between conjuncts. Some authors try to explain it by assuming that each conjunct is in its own coordination phrase, an assumption that is tied to the idea that an initial coordinator is a conjunction. I have shown that this idea is incorrect by listing a number of differences between initial coordinators and conjunctions. As an alternative, I have proposed that an initial coordinator is either the head or the specifier of a distributive phrase, which reflects the correlation between distributivity and initial coordinators. Every complete coordination and every subgroup within a complex coordination is analyzed as a DistP. If there is an initial coordinator, the construction is obligatorily [+distributive]; if not, it is lexically underspecified for distributivity, hence either plus distributive or minus distributive (i.e. collective). The possibility of subgrouping is related to the presence of an overt coordinator. Furthermore, I have argued that the lack of c-command between conjuncts is just an instance of a broader effect, namely the ‘invisibility’ of paratactic material in general, and of second conjuncts in particular. I think this justifies an analysis in which a paratactic constituent is attached to the rest of the structure in a way that starts a new c-command domain, and therefore shields it off from c-command relations with the context (i.e. the containing structure). I have defined this way of attachment in terms of a binary-branching, Minimalist type of grammar, namely as b-Merge, which indicates a special type of inclusion relation (‘behindance’) between the elements merged and the larger element that is created by Merge.

## Notes

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<sup>1</sup> Zwart (1995) and Zoerner (1995) have the premise, but not (2).

<sup>2</sup> However, if Schwarz (1999) is correct (contra Larson 1985), the sentences in (4) can be analyzed in terms of large conjuncts and gapping in the second conjunct (see also Haeseryn et al. 1997); this would save the ‘left bracket thesis’. In turn, this view is contradicted by Hendriks (2001) and Johannessen (to appear), who note that Schwarz’s view does not solve (5), and claim that initial coordinators are focus particles (which can be moved or attached at various positions, depending on the analysis). It seems to me that both views can be right at the same time. Since gapping is an independently available process, a gapping analysis of sentences as in (4) cannot be excluded. Still, an initial coordinator can be analyzed as a focus particle. See further below.

<sup>3</sup> In (5b/c) the verb second property of Dutch main clauses is exploited: since the initial coordinator triggers inversion, it must be part of the first conjunct. Similar examples can be found in German, Norwegian, Swedish, Danish and Icelandic (Johannessen 1998:154ff / to appear). Johannessen also notes that some combinations INCO...CO in some languages trigger V2 in both conjuncts; how this is possible remains to be explained.

<sup>4</sup> A reviewer wonders if a distributive reading is not simply achieved by the use of more than one conjunction. If so, this raises some doubt on a special treatment of initial coordinators. However, this is not the case; for instance, *I saw Joop and Joep and Jaap*, where we have two conjunctions, can (but need not) be interpreted collectively.

<sup>5</sup> A reformulation of these structures in terms of a 3D grammar is proposed in the next section.

<sup>6</sup> Zoerner assumes that there is a (normally empty) highest &P-shell that “serves the purpose of allowing for overt marking of distributivity” (Zoerner 1999:331), i.e. by filling it with an initial coordinator, which is either a head or a specifier. This proposal is to a large extent equivalent to the present assumption of a DistP in simple coordinations. However, if an initial coordinator is part of CoP, a potential division in subgroups in the case of multiple coordination, with the additional meanings as discussed, cannot be represented well (despite Zoerner’s claims); compare the discussion around (18) above.

<sup>7</sup> I consider Borsley’s (to appear) critique of the CoP as unsuccessful. His comments regarding multiple coordination and coordination with an initial coordinator are implicitly captured in Section 2 above. Note also that Borsley seems to have missed an earlier reply by Zoerner (1999). Furthermore, he may be right in that various kinds of unbalanced coordination are not as straightforward support for an analysis like Johannessen (1998) as is usually thought, but it seems to me that doing away with CoP makes things worse rather than better in this respect. Borsley justly points to the question how CoP acquires which features. But this is a matter of execution. Instead of Johannessen’s spec-head agreement with the first conjunct (which has its problems), one may think of feature assignment to (a projection of) the underspecified Co along the lines of Zwart (2003), who claims that AGREE is a sisterhood relationship, which is effected by Merge during the derivation. Finally, if Borsley is right in that coordination of heads, or non-XPs in general, is possible (but see Wilder 1997), we must conclude that the projection of Co is not necessarily a maximal projection. This is problematic in a traditional X’-system, but not in a Minimalist grammar. If we combine X with Co and Co projects, then Co is still a head (but a non-minimal one, as in head movement structures), according to the general formula *if  $\beta^i$  is merged with  $\alpha^p$  and  $\alpha$  projects, then the result is  $\alpha^p$*  (cf. Epstein, Thráinsson & Zwart 1996).

<sup>8</sup> A reviewer notes that there is a clear difference between e.g. *Mary<sub>i</sub> and her<sub>i</sub> husband* and *# her<sub>i</sub> husband and Mary<sub>i</sub>*, which might be attributed to c-command (Principle C?). However, note that *her* is embedded. Furthermore,

similar effects can be observed across sentences, where there is certainly no c-command: # *He<sub>i</sub> arrived. John<sub>i</sub> opened the door*. It seems to me that these effects are not absolute, but discourse-sensitive. The general pragmatic principle is of course that pronominalization is directional.

There are more potential complications, for instance the English sentence *Every<sub>i</sub> man and his<sub>i</sub> dog left* (which, by the way, I reject in Dutch), where there seems to be quantifier binding from one conjunct into another. However, Progovac (1998) and Sauerland (2001) claim that examples like these can be explained by quantifier raising out of CoP. Furthermore, note that in certain contexts quantifiers can be discourse-related to a variable; for example *Every<sub>i</sub> rice-grower in Korea owns a wooden cart. He<sub>i</sub> uses it when he harvests the crop* (Sells 1985:3). If anything, these points strengthen the argument in the main text: regularly, c-command, hence binding, is blocked, but under certain conditions the licensing of the variable can be rescued by another mechanism.

<sup>9</sup> See also De Vries (2002b, 2003a) for an introduction into coordination and 3D grammar. I must warn the reader, however, that the present article and De Vries (2003b/2004) contain an improved version.

<sup>10</sup> Another way of looking at it is the following (Jan-Wouter Zwart, p.c.): there is inclusion (dominance), and there is subscripted inclusion (behindance), i.e. inclusion with an additional property.

<sup>11</sup> In De Vries (2003b) the possibility is discussed that there is an additional, symmetrical type of Merge (s-Merge), which is equivalent to Chomsky's set Merge. It is shown that s-Merge makes 'remerging' necessary for the eventual linearization of the structure, which can lead to 'sharing' of material between (conjoined) phrases. For our present purposes, however, the potential existence of s-Merge is irrelevant.

<sup>12</sup> Our phrasal analysis of coordination, the explicit assumption of a b-inclusion relation, and the use of a coordination phrase obviates Van Oirsouw's (1987b) critique of the 3D approach, which is directed specifically at the formulation in Goodall (1987). See also Grootveld (1994) for comment.

<sup>13</sup> A reviewer suggests that a right-adjunction analysis as in Munn (1993) would also predict non-c-command: [<sub>DP</sub> DP<sub>1</sub> [<sub>&P</sub> & DP<sub>2</sub>]]. (This is correct if the notion of exclusion is taken into account, but I do not think that Munn assumes so.) However, adjunction does not solve the invisibility effects to be discussed in the next section. Moreover, there are independent arguments against an adjunction analysis, for instance the agreement in *John and Mary are/\*is nice*; see Progovac (1998) for more discussion, and see also footnote 14.

<sup>14</sup> According to Johannessen (1998) CoP's category is established by spec-head agreement, but Borsley (to appear) claims that the second conjunct influences the selection possibilities as well. Theoretically, this may be taken to imply that Koster (2000b) is right in that, in general, given a mother node and two (direct) daughters, properties of both sisters can percolate to the mother node, i.e. not only the properties of the projecting node. In (31) this would mean that first Co' takes over properties of Co and YP, then CoP inherits properties of both XP and Co'.

<sup>15</sup> A well-known exception to this rule is Across-The-Board movement (e.g. *What did Peter buy \_ and Bill sell \_* ?); this is not of interest here; see De Vries (2003b) and the references there for some comments and a possible solution in terms of shared structure (cf. G. de Vries 1992). Another approach is Wilder (1997), who argues that ATB constructions involve CP coordination with forward deletion into the second conjunct.

<sup>16</sup> Notice that (36) and (37) cannot be analyzed as matrix CP coordination of a question with a proposition, where there is forward deletion into the second conjunct, since there is no correspondence between what would be elided in the second conjunct and its antecedent in the first conjunct; e.g. in (37a) the missing part would have to be *je denkt dat je kunt* 'you think that you can', but the first conjunct contains *denk je dat je kunt*; moreover this string is not a constituent. Therefore the construction at hand provides evidence for the existence of 'small conjuncts' (contra Wilder 1997).

<sup>17</sup> Colloquial English has a quasi-serial verb construction of the type *go and get*. This may lead to examples like *What did he go and get \_*? Since the two verbs are essentially connected at the word level, this is not an example of movement from a second conjunct. This conclusion is corroborated by De Vos (2004).

<sup>18</sup> Ideally, similar results should be obtainable from languages with an equally complex pronominal system. A reviewer warns that things may be different in Norwegian. I leave this matter for future research.

<sup>19</sup> Note, however, that in some dialects of Dutch the reduced form *'mzelf* is used as an anaphor. This is not what I am after, here.

<sup>20</sup> Discourse conditions favor the use of an identifying emphatic expression over a simple pronoun here. Interestingly, the idea of a paratactic second conjunct seems to be consistent with discoveries about long-distance anaphora of English *himself*; see e.g. Zribi-Hertz (1989). I cannot go into details here, but see De Vries (1999) and the references there for a critical discussion of logophoricity and related phenomena.

<sup>21</sup> A reviewer wonders what happens if we use an initial coordinator in (42b). The result is acceptable for me, e.g. *Joop beloonde niet alleen Anna, maar ook zichzelf rijkelijk* ('not only...but also'), or *Joop beloonde en Anna en zichzelf rijkelijk* ('both...and'). How can we explain this? The answer is that the distributive reading enforced by the initial coordinator is compatible with a high scope reading (cf. Johannessen, to appear). Furthermore, I did not yet explain the position of *rijkelijk*. For this, note that forward and backward deletion can be used at the same time (see Grootveld 1994 for ample discussion); an example is *John gave Mary \_ and Tom \_ Sue a book*. Thus, the first example can be analyzed as *Joop beloonde niet alleen Anna rijkelijk, maar ~~Joop beloonde~~ ook zichzelf rijkelijk*.

<sup>22</sup> *Hemzelf* would also make a second reading available, in which e.g. Pavarotti sings a duet with himself, as in a special effects film.

<sup>23</sup> Perhaps the discourse serves as an implicit first conjunct. The same can be said for main clauses, which can also start with a conjunction, e.g. *And then he said...*

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