# *Asymmetric Merge and Parataxis*

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**Abstract.** I argue that syntactic phrase structure encodes three major asymmetries. The first represents the asymmetry between mothers and daughters that is called dominance, i.e. syntactic hierarchy. The second is the selectional asymmetry between sisters, which is translated into precedence in the phonological component. The third, called 'behindance', is an alternative for dominance, and represents parataxis. Parenthesis, coordination and apposition are analyzed on the basis of behindance. In our derivational model of grammar it is defined as a special type of inclusion that blocks c-command. It follows that parenthetic material can neither move toward the matrix, nor be bound by a constituent from the matrix. The syntactic asymmetry between first and second conjuncts is established theoretically and empirically in a new way.

## 1. INTRODUCTION AND OVERVIEW

Parataxis is the equipollent ranking of clauses or phrases, of which coordination is a canonical exemplar, (1a). In contrast, hypotaxis is the unequal ranking of clauses or phrases, of which subordination is a canonical exemplar (1b). And while hypotaxis is associated with a syntactic hierarchy, parataxis is not, or at least not in the same way.

(1) a. *Coordination as parataxis:*
The woman was standing and the man was sitting.
b. *Subordination as hypotaxis*
The woman was standing because the man was sitting.

But the notions of parataxis and hypotaxis comprise much more than coordination and subordination (Van Es and Van Caspel 1975; Quirk et al. 1999: section 13.2; Schelfhout et al. 2003a). For instance, the subject-predicate relation can be viewed as an instance of hypotaxis, since it involves the unequal ranking of two phrases. Other examples of parataxis—understood as the equipollent ranking of clauses or phrases—include parenthesis (2) and apposition (3):

(2) *Parenthesis (comment clause, hedge, appended clause, etc.) as parataxis:*
a. He was walking, *he said*, toward the railway station.
b. He asserted – *and this is how all moralists speak* – that the young are spoiled.
c. These weapons are meant to wound, *to kill, even*.
d. I told them, *mistakenly, it turned out*, that she had already left.

(3) *Apposition and appositive relative clauses as parataxis:*
a. She gave Joop, *our friend*, a present.
b. She gave Joop, *who is our friend*, a present.

With the exception of common coordination, a theoretical account of parataxis is

* For questions and comments, thanks to Anna Maria Di Sciullo, Jan Koster, Yordanka Kavalova, Jan-Wouter Zwart, Henk van Riemsdijk, Hana Skrabalova, Hans Broekhuis, Anneke Neijt, Olaf Koeneman, Janneke ter Beek, Herman Heringa, Marlies Kluck, and the anonymous reviewers of the *Canadian Journal of Linguistics*.

lacking in the literature, especially in the Minimalist Program. This gap reflects the fact that syntax is preoccupied with hypo- and hypertactic relations, which are usually modelled with hierarchical structures in the form of tree diagrams or constituent bracketing. How paratactic relations are to be represented remains unclear. In this context, the two questions I address here are:

(i) How can the non-subordinative properties of paratactic constructions be represented in syntax?
(ii) Can we generalize over coordination and other types of parataxis?

Section 2 reviews the differences between hypotaxis and parataxis, and illustrates the link between apposition and coordination. It is concluded that, in addition to the relations of dominance and precedence, the relation of *behindance* is needed to describe paratactic phenomena. Section 3 discusses theoretical preliminaries such as the independence of dominance and behindance, and the properties of Merge. Section 4 presents the theoretical proposal, and its application to coordination and parenthesis. Section 5 argues that paratactic material is invisible to relations based on c-command. Section 6 concludes.

## 2. PARATAXIS AND BEHINDANCE

After reviewing the properties of parataxis (section 2.1), I argue that apposition is a special case of coordination (section 2.2), and that that parataxis does not involve c-command (section 2.3). I propose that there is a common ground to all types of parataxis (section 2.4): this is what I call *behindance*, following Grootveld (1994).

### 2.1. Some properties of parataxis

There are simple tests that distinguish coordination from subordination. For example, in Dutch and German, conjoined main clauses display V2, whereas subordinated clauses have V-final order. This is illustrated in (4) for Dutch: the verb *las* 'read' occupies a V2-position when it occurs in a conjoined clause (4a), but a V-final position when it is in a subordinate clause (4b).

(4) *Dutch:*
a. Karel keek televisie en Joop las de krant.
Karel watched television and Joop read the newspaper
'Karel watched television and Joop read the newspaper.'
b. Karel keek televisie omdat Joop de krant las.
Karel watched television because Joop the newspaper read
'Karel watched television because Joop read the newspaper.'

While conjoined DPs generally appear in the same case-form, a subordinate DP has an oblique Case (determined by the preposition).[1] This is illustrated in (5) for German: in (5a) the two conjoined DPs both bear nominative case (*der Mann*, *die Frau*); in (5b), the subordinate DP is marked for dative case (*dem Hut*).

(5) *German:*[2]

a. Der Mann und die Frau sind unzertrennlich.
the.NOM man and the.NOM woman are inseparable
'The man and the woman are inseparable.'

b. Der Mann mit dem Hut ist zurück.
the.NOM man with the.DAT hat is back
'The man with the hat is back.'

Third, coordination is category-neutral in many languages (6). (But see Johannessen 1998:84ff and Haspelmath 2004 for a qualification.) This contrasts with subordinators, which typically select for a complement of a particular category: prepositions canonically select for nominal DP complements (7a); complementizers canonically select for clausal IP complements (7b).

(6) XP and XP (where X = A, P, N, V, D, I, C, etc.)

(7) a. [P DP]
b. [C IP]

Fourth, gapping is generally possible in coordinate structures (8a), but not in subordinated clauses (8b).

(8) a. Bill bought a CD, and John _ a book.
b. * Bill bought a CD because John _ a book.

Fifth, it has been claimed that there is a valency difference between coordination and subordination (Van der Heijden 1999): a coordinator conjoins conjuncts, but a subordinator does not subordinate subjuncts, that is, there is no such thing as a first or second subjunct.

Sixth, a conjunct or a part of it cannot move (Ross's 1986 Coordinate Structure Constraint), but a subordinate phrase can:

(9) a. * And who did you see Mary _ ?
b. * Who did you see Mary and _ ?
c. * Who did John kiss Anne and Mary hit _ ?

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[1] But see Johannessen (1998) for discussion of syntactically unbalanced coordination.

[2] The following abbreviations are used: Co=conjunction, CoP = coordinate phrase, DAT = dative, NOM = nominative, ParP = parenthetic phrase, PRON = pronoun.

(10) a. In which garden did you rest _ ?
b. Which garden did you rest in _ ?
c. Who did you say that Mary hit _ ?

In short, there is a clear distinction between coordination and subordination. But see Van der Heijden (1999) and Culicover and Jackendoff (1997) for discussion of non-parallel coordination and insubordination, which fall somewhere between the canonical cases of coordination and subordination discussed here.

Let us turn from coordination to other types of parataxis, such as parenthesis and apposition, which have the following properties:

(11) a. They are not selected by any part of the matrix clauses. Therefore they cannot have a restrictive meaning, but are interpreted as additional information.
b. They are phonologically marked by a low intonation. They interrupt the intonation contour of the matrix, but do not affect it.
c. (i) They are linearly integrated with the matrix;
(ii) but they are not part of the syntactic hierarchy in terms of c-command;
(iii) yet, they can be added on a constituent level; and
(iv) depending on the type, they can be inserted in various positions, but not just anywhere.

The linear integration of paratactic clauses with a matrix clause (11c-i) implies that they are integrated into their host environment before spell-out, that is, in the overt syntax. Given a model of grammar where syntax feeds PF and LF, and given that a paratactic phrase is pronounced, it cannot be the case that this phrase is added at the discourse level, or some other level beyond LF, *contra* Fabb (1990) or Safir's (1986) treatments of appositive relative clauses. Conversely, given the fact that a paratactic phrase has a meaning, it cannot be the case, either, that it is introduced only after PF. This last point is strengthened by (11c-iii)—paratactic clauses and phrases can be added on a constituent level—which holds of not only appositions and appositive relatives, but also of parentheticals.

For example, in (12a), the scope of the parenthetical *I think* is ambiguous between the paraphrases given in (12b-i, ii). The first reading arises if the parenthetical is added onto a constituent of the matrix clause, namely *his grandmother*, as in (12c-i). The second reading arises when the parenthetical is added on at the level of the matrix clause, as in (12c-ii).

(12) a. Tomorrow John will visit his grandmother, *I think*.
b. (i) I think that it is his grandmother that John will visit tomorrow.
(ii) I think that John will visit his grandmother tomorrow.
c. (i) Tomorrow John will visit [[his grandmother], I think]
(ii) [[I think that John will visit his grandmother] tomorrow]

Moreover, as stated in (11c-iv), paratactic phrases are sensitive to syntactic structure, and so cannot be freely inserted into any position. This is illustrated in (13): the

parenthetical reporting clause *he said* can be inserted between two major constituents (13a), but not inside a major constituent (13b).

(13) a. He was walking, *he said*, toward the railway station.
b. * He was walking towards the, *he said*, railway station.

The above establishes that paratactic material is sensitive to syntactic information, and so must be represented in syntax, to then be passed on to both the phonological component (PF) and the semantic component (LF).

### 2.2. The relation between apposition and coordination

The relation between apposition and coordination is not immediately obvious. Consider the appositions in (14) from English and in (15) from Dutch.

(14) *English*:
a. John, our boss
b. a nice present: a book by Golding
c. John, a nasty liar
d. the White House, *or* the house with the Oval Office

(15) *Dutch:*
a. Fik is een hond, *en wel* een poedel.
Fik is a dog, and indeed a poodle
'Fik is a dog, namely a poodle.'
b. Jan begaf zich naar beneden, *en wel* naar de kelder.
Jan proceeded SE toward downstairs, and indeed to the basement
'Jan went downstairs, namely to the basement.'
c. het Witte Huis, *ofwel* het huis met het ovalen kantoor
the white house, or the house with the oval office
'the White House, or the house with the Oval Office'

Relevant to the present discussion is the presence, in English, of the coordinator *or* (14d), and in Dutch of the coordinative expressions *en wel* 'and indeed' (15a-b) and *ofwel* 'or' (15c). The fact that coordinators sometimes occur in appositive constructions suggests that the latter may be a kind of coordination, as discussed by Quirk et al.:

> Apposition resembles coordination in that not only do coordinate constructions also involve the linking of units of the same rank, but the central coordinators *and* and *or* may themselves occasionally be used as explicit markers of apposition. (1999:1301–1302)

As regards the semantics of apposition, observe that in all of the examples given in (14) and (15), the second part further specifies the first part. For English, in (14a) *our boss* further specifies John; in (14b) *a book by Golding* specifies what constitutes a nice present; in (14c) *a nasty liar* further specifies John; and in (14d) *the house with the Oval*

*Office* provides a further specification of the White House. Similarly, for Dutch, in (15a) *een poedel* 'a poodle' further specifies dog; in (15b) *naar de kelder* 'to the basement' further specifies downstairs; and in (15c) *het huis met het ovalen kantoor* 'the house with the Oval Office' specifies the White House.

If apposition is indeed a type of coordination, then it can be claimed that, next to conjunction and disjunction, there is a third type of coordination, which designates specification (Kraak and Klooster 1968: chapter 11). Specifying coordination can be explicitly marked by a specifying phrase such as *or rather, namely, that is,* depending on the exact semantic subtype, but often the connection is asyndetic, that is, phonologically empty. Prosodically, it always triggers a comma and a low intonation of the second conjunct.

Many authors have stressed the similarity between appositions and appositive relative clauses: Delorme and Dougherty (1972), Halitsky (1974), Klein (1977), Doron (1994), and Canac-Marquis and Tremblay (1998). Furthermore, Sturm (1986), Koster (2000a), and M. de Vries (2006a) explicitly advance a coordination analysis of appositive relatives.

### 2.3. Parataxis and c-command

In her overview article on coordination, Progovac (1998) concludes that there is no clear evidence for a potential c-command relation between conjuncts; in fact, there is some counterevidence. For instance, in (16), the antecedent in the first conjunct cannot bind the anaphor in the second conjunct; given that binding requires c-command, this indicates that the first conjunct does not c-command the second one.

(16) a. * Either John$_i$ or a picture of himself$_i$ will suffice.

b. *Serbo-Croatian:*
* Jovan$_i$ i svoja$_i$ zena su stigli.
Jovan and self's wife are arrived
*Intended:* 'Jovan and self's wife have arrived.' (Progovac 1998:3)

The absence of a c-command relation between the first and second conjunct is confirmed in Dutch. In (17), the antecedent in the first conjunct (*Joop*) cannot bind the local anaphor *zichzelf* contained in the second conjunct.[3]

(17) *Dutch:*
a. * Ik luisterde naar een gesprek tussen Joop$_i$ en zichzelf$_i$.
I listened to a conversation between Joop and SE-SELF.
*Intended:* 'I listened to a conversation between Joop and himself.'

[3] In (17a) *hemzelf* 'him-SELF', which is discourse-licensed, would be felicitous; in (17b) *hem* 'him' would be felicitous.

b. * Toon me Joop$_i$ of een foto van zichzelf$_i$!
Show me Joop or a picture of SE-SELF!
*Intended:* 'Show me Joop or a picture of him!'

Moreover, quantifier-variable binding between conjuncts is unacceptable: in (18a) the quantifier *elke* 'every' in the first conjunct cannot bind the pronoun *zijn* 'his' in the second conjunct; in (18b) the quantifier *alle* 'all' in the first conjunct cannot bind the pronoun *hun* 'their' in the second conjunct.

(18) *Dutch:*
a. * Elke$_i$ man en zijn$_i$ vrouw gingen naar de film.
every man and his wife went to the movies
*Intended:* 'Every man and his wife went to the movies.'
b. * Willen alle$_i$ honderd kinderen en hun$_i$ moeder naar voren komen?
want all hundred children and their mother to the.front come
*Intended:* 'All hundred children and their mother, please advance.'

Progovac (1998) accounts for English examples like *Every$_i$ man and his$_i$ dog left* by quantifier raising; see also Sauerland (2001). If this is so, this leaves (18) unexplained, unless the application of quantifier raising is constrained by language-specific parameters. In certain contexts quantifiers can be discourse-related to a variable; for example *Every$_i$ rice-grower in Korea owns a wooden cart. He$_i$ uses it when he harvests the crop* (Sells 1985:3). If anything, these points strengthen the argument: quantifier-variable binding normally requires c-command, but under certain conditions the licensing of the variable can be rescued by another mechanism.

By contrast, the hypotactically construed equivalents to (18)—using *met* 'with' instead of *en* 'and'—are fine:

(19) *Dutch:*
a. Elke$_i$ man ging met zijn$_i$ vrouw naar de film.
every man went with his wife to the movies
'Every man went to the movies with his wife.'
b. Willen alle$_i$ honderd kinderen met hun$_i$ moeder naar voren komen?
want all hundred children with their mother to the.front come
'All hundred children with their mother, please advance.'

The above establishes that material contained in the first conjunct cannot bind material contained in the second conjunct. It is also the case that movement from the second conjunct into the first conjunct is unacceptable (20). This is expected, given that movement to a non-c-commanding position is impossible.

(20) * [Which man$_i$ and a friend of $t_i$] are both handsome?

Another context that requires c-command is the licensing of negative polarity items. As expected, the first conjunct cannot license a negative polarity item in the second

conjunct, as shown in (21). (See Hoeksema 2000 for discussion.)

(21) He chased nobody and no/*any dogs. (Progovac 1998:3)

We have seen that the second conjunct cannot be bound by the first conjunct and it cannot move into the first conjunct. Nor can a negative polarity item in the second conjunct be licensed by material in the first conjunct. A simple generalization captures this: there is no c-command relation between conjuncts (M. de Vries 2007). At first glance, Principle C effects such as (22) constitute a counterexample to this claim (Munn 1993). However, the same effect is observed across sentences (Progovac 1998) (22b).

(22) a. *He$_i$ and John$_i$'s dog went for a walk.
b. *He$_i$ finally arrived. John$_i$'s dog went for a walk.

I conclude that whatever pragmatic principle rules out (22b) also accounts for the impossibility of (22a). This means that we can retain the generalization there is no c-command relation between conjuncts. If so, then the relation between conjuncts is not hypotactic.

### 2.4. Behindance

There remains the question of how to characterize the relation between conjuncts. One possibility explored by Progovac (1998) is to embed both conjuncts in a coordination phrase of their own: [[$_{CoP}$ ø XP] [$_{CoP}$ and YP]]. The position of the first conjunction is reserved for an initial coordinator (as in *both…and…,* for instance). However, this cannot be correct. First, initial coordinators are different from regular conjunctions (Johannessen 1998; Bredschneijder 1999; Hendriks and Zwart 2001; Skrabalova 2003; Hendriks 2004; M. de Vries 2005a; Johannessen 2005). Second, there is an asymmetry between conjuncts that can only be explained if there is a paratactic relationship; I return to this below.

Another possibility, which is the one I pursue here, is an analysis in terms of parallel structures or three-dimensional structures. In such analyses, conjuncts, rather than being hierarchically organized, are viewed as situated behind each other. For instance, in (23), *Mary* is behind *Bill*, and *Sue* behind *Mary*.

(23) Bill, Mary, *and* Sue } went to the movies.

This idea has been expressed in different ways by a number of authors, including Williams (1978), Goodall (1987), G. de Vries (1987, 1992), Mu'adz (1991), Moltmann (1992), Grootveld (1992, 1994), Te Velde (1997), and Van Riemsdijk (1998).

The approach by Goodall (1987) and G. de Vries (1987, 1992) is based on set union of reduced phrase markers (in the sense of Lasnik and Kupin 1977), an idea which can be attributed to Rini Huybregts. In the resulting set, there can be elements (*monostrings*) that neither dominate nor precede each other; such an object is not representable by a conventional tree-diagram. Coordination is assumed to be sentential only, and the

combined sentences occupy different planes. Somewhat differently, Mu'adz (1991) allows for phrasal coordination, and defines planes explicitly. Moltmann (1992) further formalizes this approach: making use of McCawley's (1968, 1982) graph theory, she distinguishes between m-planes (meaning-planes) and f-planes (formal-planes) which relate to formal syntax. (See Rogers 2003 for a discussion of multidimensional graphs.) In all of these works, an explicit behindance relation is lacking: it is inferred from the absence of dominance and precedence. Grootveld (1992:70) states that this means that Goodall "does not take the third dimension seriously". Van Oirsouw (1987) criticizes the parallel structure approach to coordination, but Haegeman (1988:287) stresses the merits of Goodall's work, noting that the difficulties are often matters of execution. Grootveld (1992) replies to Van Oirsouw that the problems are not inherent to a three-dimensional approach: rather, the major issues relate to (i) Goodall's commitment to a sentential analysis of coordination, (ii) the lack of a structural position for the conjunction markers, and (iii) the absence of an explicit behindance relation. I agree with Grootveld that these problems can be avoided by combining the concept of behindance invoked in parallel structure analyses with an approach that recognizes the existence of a Coordinate Phrase (CoP). It may at first seem unattractive to complicate syntax in this way simply to accommodate common coordination. However, if behindance is the basis for all types of parataxis—as claimed here—then the idea may have some merit.

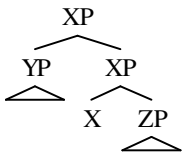
## 3. THEORETICAL PRELIMINARIES

After showing that dominance and precedence relations are defined independently of each other (section 3.1), I discuss in some detail the logical outputs of the structure-building operation Merge (section 3.2).

### 3.1. The independence of dominance and precedence

Kayne (1994) claims that precedence derives from asymmetric c-command—hence indirectly from dominance. If this is correct, precedence is not an independent degree of freedom in syntax. Consequently, behindance, if it exists, does not constitute the *third* dimension in syntax—but the second. Kayne's theory is formulated as the Linear Correspondence Axiom. Consider (24), where YP is the specifier of X and ZP the complement of X. (In Kayne's notation, a specifier is an adjunct; X-bar labels do not exist.)

(24)




According to Kayne (1994), the asymmetry between the sister nodes X and its complement ZP need not be stipulated: X asymmetrically c-commands the components of ZP, so by the Linear Correspondence Axiom X precedes Z in the output string. The c-command relation between X and ZP is mutual, and so is irrelevant in determining word order. In this way, asymmetric c-command leads to the conclusion that the

dominance relation derives the precedence relation. However, in many cases, information about precedence cannot be derived from dominance. Consider the specifier YP and its sister node, the lower segment of XP. YP and XP mutually c-command each other, and so no linear order between their terminals can be established. This is not the desired outcome; Kayne (1994:16ff) solves this by adding proviso (i) to the definition of c-command (25).

(25) X c-commands Y iff:
  (i) X and Y are categories, *and*
  (ii) X excludes Y, *and*
  (iii) every category that dominates X dominates Y.

The lower XP in (24) is a segment and not a category. Therefore, it cannot enter into a c-command relation with anything. So YP c-commands all the components of XP, but XP does not c-command the components of YP. (As for the higher XP, it does not c-command YP because (25-ii) is not satisfied, since XP does not exclude YP.) Consequently, YP asymmetrically c-commands the components of XP, and so linear order can be established. Kayne's attempt to derive precedence from hierarchy is ultimately unsuccessful because—to create an asymmetry between the sister nodes YP and XP—he must stipulate that a segment cannot enter into a c-command relation (25-i).

Now consider how Chomsky's (1995) Minimalist Program fares: precedence is not part of the core syntax, and word order is relegated to the phonological component. This departs from Kayne, for whom conditions on word order are at the heart of the grammar. Still, Chomsky (1995:334ff) accepts Kayne's idea that syntax is antisymmetric, and that word order can be derived from dominance. But Chomsky faces the same problem as Kayne: just as Kayne excludes XP segments from c-command, Chomsky excludes intermediate X-bar nodes from c-command. Such a move is equivalent to the proviso in (25-i). Moreover, if c-command is derived in the course of the syntactic derivation (Epstein 1999), and if X and Y Merge, then c-command is the total relation between X on the one hand, and Y and all its constituents on the other hand. (Epstein uses the term *category* rather *constituent*, but the former plays no substantive role in his discussion.) But if c-command derives from Merge (Epstein 1999), then a proviso such as (25-i) is not only unnecessary but impossible. This leads to the conclusion that precedence does not follow from dominance, but is an independent relation.

This finding is in keeping with Koster (1999, 2000b), who identifies precedence as one of the basic properties of the Configurational Matrix, which says that, universally, syntactic structures are formed as $[_{\beta}\ \alpha\ \delta]$. Here, $\delta$ is an element that depends on $\alpha$, the antecedent (in the broadest possible sense). This configuration applies not only to anaphora, but also to structure-building operations such as Merge. Zwart (1999) comments that the Configurational Matrix should have two, and preferably only two, properties: bi-uniqueness (i.e., one $\alpha$ relates to one $\delta$) and asymmetry. In terms of Merge we may say that $\alpha$ is added to the target $\delta$. So the asymmetry between sisters concerns the question of what depends on what (Zwart 2006). This asymmetry is the second degree of freedom in syntax; following traditional terminology, I call it precedence. Precedence in syntax is the abstract asymmetry between $\alpha$ and $\delta$; linearization translates abstract

syntactic precedence into precedence between elements in a string.

From the discussion above, it follows that Merge is not "set Merge", *contra* Chomsky (1995:243). If A and B Merge, they combine as an ordered pair < A, B >. This is also claimed by Koster (1999, 2000b), Zwart (1999, 2004, 2006), Di Sciullo (2000), and Langendoen (2003). In a tree, A appears to the left of B; this is equivalent to the ordered set notation.

### 3.2. Properties of Merge

A syntactic derivation makes use of the structure building operation Merge (Chomsky 1995). If we have binary branching, Merge combines two syntactic objects into a larger object. Merge is often distinguished from Move, but, strictly speaking, this is inaccurate, as Move involves Merge; only the input is different. (An aside on terminology: note that Chomsky 2001 uses External Merge [for normal Merge] and Internal Merge [for Move].)

Even if we presuppose strict cyclicity, there are in fact seven logical possibilities to consider regarding the output of Merge. This reflects the status of the relevant input object, which can be:

(i) selected from the lexicon (or numeration);
(ii) a partial derivation from the syntactic work space (that is, the result of a previous instance of Merge); and
(iii) a constituent of a partial derivation in the syntactic workspace.

Of the seven logical possibilities, the first three are illustrated in (26). These are instances of simple Merge, and consist of selecting input objects selected from the lexicon (i) and input objects that are partial derivations (ii). For expository purposes, it is assumed that the lexicon contains heads (X, Y), and that partial derivations are phrases (XP, YP). Note that possibility 2—the Merge of an input selected from the lexicon with an input that is a partial derivation —is associated with two symmetrical subcases, 2a and 2b.

(26) *Simple Merge: Merge($\alpha$,$\beta$), input from lexicon or partial derivation*

| | $\alpha$ | $\beta$ | output |
|---|---|---|---|
| 1. | lexicon | lexicon | [X Y] |
| 2a. | lexicon | partial derivation | [X YP] |
| 2b. | partial derivation | lexicon | [XP Y] |
| 3. | partial derivation | partial derivation | [XP YP] |

Which of the two input objects projects is important, but this is another issue, as is the discussion on the necessity of a label (Chomsky 1995; Collins 2002); I put these matters aside.

If re-merging a constituent (iii) is taken into account, we arrive at a fourth logical possibility, shown in (27); this is usually called Move. Note that there are two symmetrical subcases, 4a and 4b, which further subclassify according to whether the re-merged constituent is a head or a phrase. For ease of exposition, the movement site is indicated by a trace (with no commitment regarding the theoretical status of the latter).

(27) *Internal Remerge: Merge(α,β), input from (constituent of a) partial derivation*

| | α | β | output |
|---|---|---|---|
| 4a-i | constituent of YP | partial derivation | [$XP_i$ [$_{YP}$ … $t_i$ …]] |
| 4a-ii | | | [$X_i$ [$_{YP}$ … $t_i$ …]] |
| 4b-i | partial derivation | constituent of XP | [[$_{XP}$ … $t_i$ …] $YP_i$] |
| 4b-ii | | | [[$_{XP}$ … $t_i$ …] $Y_i$] |

Example (27) involves Internal Remerge, where the constituent to be remerged is combined with the root that originally contained it. Another possibility is External Remerge, where the constituent to be remerged (which as before may be a head or a phrase) is combined with a root that did not originally contain it. In terms of outputs, this gives rise to the last three of the seven logically possible outputs of Merge; I adopt the convention of marking with an asterisk the externally merged constituent.

(28) *External Remerge: Merge(α,β), input from constituent external to derivation*

| | α | β | output |
|---|---|---|---|
| 5a-i. | constituent of ZP | lexicon | [$XP_*$ Y] |
| 5a-ii. | | | [$X_*$ Y] |
| 5b-i. | lexicon | constituent of ZP | [X $YP_*$] |
| 5b-ii. | | | [X $Y_*$] |
| 6a-i. | constituent of ZP | partial derivation | [$XP_*$ YP] |
| 6a-ii. | | | [$X_*$ YP] |
| 6b-i. | partial derivation | constituent of ZP | [XP $YP_*$] |
| 6b-ii. | | | [XP $Y_*$] |
| 7-i. | constituent of WP | constituent of ZP | [$XP_*$ $YP_*$] |
| 7-ii. | | | [$X_*$ $YP_*$] |
| 7-iii. | | | [$XP_*$ $Y_*$] |
| 7-iv. | | | [$X_*$ $Y_*$] |

The options in (28) are usually ignored, and of course they could be explicitly excluded. There are two ways to interpret (28): as multidominance or as interarborial movement (M. de Vries 2005b, 2005c).[4] The latter is explored by Bobaljik and Brown (1997) and Nunes (2001); the former by Van Riemsdijk (2004) and Citko (2005). Interarborial movement is also called *sideward movement* (Nunes 2001). Multidominance is sometimes called *sharing, grafting* (Van Riemsdijk 1998, 2004), or *Parallel Merge* (Citko 2005). Multidominance, as such, was proposed earlier by Sampson (1975), McCawley (1982), and by now, numerous others, especially in the context of Right Node

[4] One could also interpret regular movement (Internal Remerge) in terms of multidominance; see Sampson (1975), Blevins (1990) [ref], Gärtner (2002), Frampton (2004), and M. de Vries (2005b, 2005c).

Raising. Here, I refrain from discussing constructions that involve the application of External Remerge.

This completes the survey of all of the logical outputs of the structure-building operation Merge. I conclude this section with some comments on what I take to be the core properties of Merge, the boundary conditions that it is subject to, and the relation of Merge to c-command. Merge has two core properties: it is a structure-building operation that combines syntactic objects (29a), and in so doing induces hierarchical relations amongst those objects (29b).

(29) *Core properties of Merge:*
   a. *Structure building*: Merge combines syntactic objects into one new, larger object.
   b. *Hierarchical*: The input objects are included in the newly created output object.

Merge is subject to a number of boundary conditions: because it takes two input objects, it necessarily generates binary branching structures (30a); it freely selects its input objects (30b), it is strictly cyclic (30c), and it is asymmetric (30d).

(30) *Boundary conditions on Merge:*
   a. *Binary branching*: Merge takes two input objects.
   b. *Free selection*: An input object is:
      (i) selected from the lexicon (or numeration), *or*
      (ii) a partial derivation selected from the syntactic work space, *or*
      (iii) a constituent of a partial derivation.
   c. *Strictly cyclic*: The output of Merge is not included in a larger syntactic object.
   d. *Asymmetric*: The output of Merge is an ordered pair.

Thus, Merge builds hierarchical structures whose inputs are binary and freely selected, and whose outputs are strictly cyclic and asymmetric. I now turn to the question of whether Merge can derive c-command. Extending Epstein's (1999) proposal, the c-command dependency between words and phrases is generated during the course of the syntactic derivation, as in (31). The equivalent representational definition is given in (32).

(31) *C-command: derivational definition (preliminary version)*[5]
If Merge(A,B) then A c-commands B and all the constituents included in B.

(32) *C-command: representational definition*
A c-commands B iff there is an X, X is B or X includes B, for which holds: A is the preceding sister of X.

(The preliminary version in (31) will be modified below.) The c-command relation is total because of the cyclic extension condition (30c) in combination with the fact that inclusion is a transitive relation. Furthermore, since Merge is asymmetric, c-command is

[5] I do not use *term*, which means "constituent included in".

asymmetric.[6] That is, for all A, B: if A c-commands B, it cannot be the case that B c-commands A.

The next section shows how the idea of behindance can be treated in terms of Merge.

## 4. PROPOSAL: PARATAXIS AS BEHINDANCE-INCLUSION

After introducing the distinction between dominance-Merge versus behindance-Merge (section 4.1), I show how it applies to coordination (section 4.2), apposition (section 4.3), and parenthesis (section 4.4).

### 4.1. Dominance-Merge versus behindance-Merge

In the three-dimensional accounts cited above, behindance is viewed as an alternative to precedence. Accordingly, there would be two ways of ordering a pair, with additional assumptions needed for linearization. For instance, the algorithm that scans a syntactic structure and produces a (linear) string would need to be able to recognize behindance. For tree structures, one could go to a daughter node, to the +preceding one or the -behind one first; add terminals to the string, etc. The tree is scanned top-down, left-right, and front-back. With binary branching, sister nodes are organized left-right or front-back. Without additional assumptions, such three-dimensional graphs are equivalent to two-dimensional ones. Crucially, in such approaches, conjuncts are treated symmetrically, with all conjuncts dominated by nodes higher up in the matrix clause. But it remains unclear how such analyses account for cases of parataxis other than common coordination.

There is a more interesting way of representing behindance, namely as an alternative for dominance. Since dominance is itself based on the notion of inclusion, this means that we have to reconsider inclusion. If A and B are included in C, C dominates A and B; I call this *dominance-inclusion*. My proposal is simple: there is a second type of inclusion, which I call *behindance-inclusion*. (Alternatively, there is inclusion [dominance], and there is subscripted inclusion [behindance], that is, inclusion with an additional property [Jan-Wouter Zwart, p.c.].)

Like dominance and precedence, behindance is determined locally. (Strictly speaking, precedence and dominance parallel *minus* behindance ["beforeness"].) Inclusion is still a transitive relation: if A x-includes B and B x-includes C, then A x-includes C, where x may be *d-included* (dominance-included) or *b-included* (behindance-included). C-command is now reformulated as (33):

(33) *C-command (definitive version):*
If Merge(A,B) then A c-commands B and all the constituents dominance-included (d-included) in B.

As we shall see, one consequence of defining c-command in terms of dominance-inclusion is that behindance—which is the basis of paratactic structures—will be blind to

[6] This is correct if specifiers and heads universally precede intermediate categories (predicates) and complements, respectively (Kayne 1994). If claims about a universal X'-schema turn out to be wrong, the definition of c-command in (31) can be adjusted to: "if Merge(A,B) then A c-commands B […] *and* B c-commands A […]".

c-command relations.

Recall that one of the core properties of Merge is that it derives syntactic objects that have a hierarchical structure; this reflects the fact that the output of Merge includes its input. But if there are two types of inclusion—dominance-inclusion (d-inclusion) and behindance-inclusion (b-inclusion)—then there are two types of Merge, namely dominance-Merge (d-Merge) and behindance-Merge (b-Merge).

(34) a. *Dominance-Merge* *(d-Merge):*
The input objects are d-included in the output object.
b. *Behindance-Merge* *(b-Marge:*
The input objects are b-included in the output object.

While d-Merge is the basis for syntactic hierarchy, b-Merge produces a paratactic hierarchy. On this view, parataxis (and hence b-Merge) is independent of multidominance. Therefore, grafting (Van Riemsdijk 2004) or parallel Merge (Citko 2005) is a different subject: although it often arises in the context of coordination (e.g., across-the-board wh-movement or backward conjunction reduction) it is not restricted to coordination (e.g., it also occurs with transparent free relatives). The latter predictably fail to show the invisibility effects discussed below (see also Espinal 1991).

Let us turn to the representation of syntactic objects. We can draw a tree structure, or use sets, or compile a list of local relations: these notations are equivalent. This is illustrated in (35) for d-Merge, and in (36) for b-Merge, with the representations in (a) using tree structures, those in (b) using sets, and those in (c) listing the local relations. To represent b-Merge with tree-structures and set notations, additional conventions are necessary. For example, in (36a), dotted lines are used to suggest a three-dimensional space, so that A and B are behind C; in (36a-ii) and (36b), the paratactic hierarchy is indicated by an asterisk next to C.

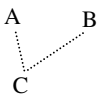
(35) d-Merge (A,B) → C

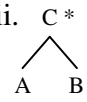
a. 


b. $[_{C}$ A, B ]

c. A precedes B
C dominates A
C dominates B

(36) b-Merge (A,B) → C

a.i 

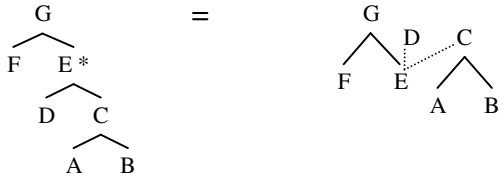

a.ii. 


b. $[_{C*}$ A, B ]

c. A precedes B
A is behind C
B is behind C

Consider a structure where both dominance-Merge and behindance-Merge have applied the derivation is in (37a), the representation is in (37b).

(37) a. d-Merge(A,B)→C
b-Merge(D,C)→E
d-Merge(F,E)→G

b. 


According to the definition of c-command in (33), A c-commands B (B is d-included in A); D c-commands C, A, and B (A, B, and C are d-included in D); and F c-commands only E (E is d-included in F). Crucially, F does not c-command D and C, as they are not d-included in E. This is because the syntactic hierarchy is interrupted at E by the paratactic hierarchy; hence the constituents of E are in a *paratactic* relation to the higher nodes.

The linearization of syntactic structure must take place at or beyond the syntax-phonology interface, and is complicated by the use of three-dimensional graphs. However, this is not the case for the present theory. A recursive tree-scanning algorithm uses information relating to constituency (inclusion), and to the asymmetry between sisters (precedence). The processing time of such an algorithm grows linearly with the size of the input object. This is an advantage over an exponentially growing procedure like Kayne's (1994) Linear Correspondence Axiom, which can be implemented as a filter; see M. de Vries (2002:7ff).

A tree is scanned top-down from most inclusive to least inclusive node, and the terminals (words) can then be arranged in a string. Since inclusion generalizes over behindance-inclusion and dominance-inclusion, it is irrelevant whether daughter nodes are below or behind their mother node. And binary branching prevents nodes from being simultaneously below *and* behind some mother node. In (37), D and C are daughters of E; scanning the structure generates the terminal string [F D A B].

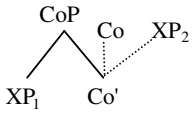
The next sections show how the theory outlined above applies to coordination and parenthesis.

### 4.2. Behindance-Merge and Coordination

Simple coordination consists of two conjuncts and a conjunction. The latter, for example *and*, has been argued to be a functional head (Munn 1987; Johannessen 1998; Van der Heijden 1999), which I here label Co. Co combines with the second conjunct to form Co'; then the first conjunct Merges with Co' to form CoP. The second conjunct is not hierarchically subordinated, as it would be if the structure were derived by dominance-Merge (d-Merge): $[_{CoP}XP_1\ [_{Co'}\ Co\ XP_2]]$. Rather, the second conjunct is paratactically construed; in the present analysis, this indicates that the second conjunct combines via behindance-Merge (b-Merge). This is illustrated in (38): the derivation appears in (38a), and the corresponding structure in (38b).

(38) a. b-Merge(Co,$XP_2$)→Co',
d-Merge($XP_1$,Co')→CoP

b.




The structure in (38b) is binary branching. Co and $XP_2$ are behind Co'; therefore, they are not c-commanded by $XP_1$. Furthermore, [$_{Co'}$ Co $XP_2$] is a constituent (and [$_{CoP}$ $XP_1$ Co $XP_2$] is too), but crucially [$XP_1$ Co] is not a constituent. In other words, as noted in Ross (1986), the coordinator forms a unit with the second conjunct, but not with the first conjunct. This is illustrated in (39)–(41): the well-formed (a) examples are instances of [$_{Co'}$ Co $XP_2$]; the ill-formed (b) examples are attempts to treat the [$XP_1$ Co] sequence as a unit.

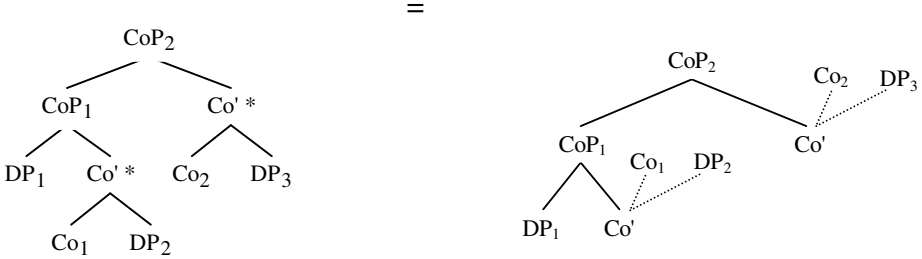
(39) a. Bill went to the movies. And Anna stayed at home.
b. * Bill went to the movies and. Anna stayed at home.

(40) a. Bill bought two books _ yesterday, and one magazine.
b. * Bill bought _ one magazine yesterday, two books and.

(41) a. Bill, and Anna.
b. * Bill and, Anna.

A more complicated case, such as (42a), where the first conjunct is itself a coordinate structure, has the derivation in (42b), and is represented as in (42c). Only local relations are computed: $Co_1$ (*and*) and $DP_2$ (*Joop*) are behind $Co_1$'; $DP_2$ is paratactically related to $DP_1$ (*Jaap*); similarly, $DP_3$ (*Joep*) is paratactically related to the $CoP_1$ (*Joop and Jaap*). (See M. de Vries 2005a for discussion of initial coordinators and distributivity effects.)

(42) a. ((Jaap and Joop) or Joep)
b. b-Merge($Co_1$,$DP_2$)→Co'$_1$
d-Merge($DP_1$,Co'$_1$)→$CoP_1$ b-Merge($Co_2$,$DP_3$)→Co'$_2$
d-Merge($CoP_1$,Co'$_2$)→$CoP_2$
c.



The present proposal combines the Coordinate Phrase (CoP) hypothesis with a binary branching three-dimensional structure, formalized in terms of behindance-inclusion (b-inclusion). It differs from analyses such as Williams (1978) and Goodall (1987) in important respects: (i) the structure is asymmetric; (ii) it involves a Coordination Phrase (which provides a structural position for the conjunction as the Coordinative head); (iii) the paratactic dimension is explicitly defined; and (iv) no multidominance is needed for coordination.

Apart from the issue of b-inclusion (to which I return below), the Coordinate Phrase proposed here is essentially that of Johannessen (1998). I have nothing new to offer concerning Case and agreement: the latter requires that the structure be asymmetric, so that phenomena such as unbalanced Case and first conjunct agreement can be handled. (See Munn 1993, Johannessen 1998, Camacho 1997, Progovac 1998, Aoun et al. 1999, and Citko 2004 for discussion.)

### 4.3. Behindance-Merge and Apposition

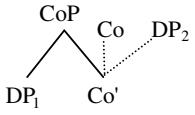
As already discussed above, appositions and appositive relative clauses can be analyzed as instance specifying coordination; some examples are repeated in (43).

(43) a. Joop, our boss
b. Joop, (i.e., he) who is our boss
c. the White House, or the house with the Oval Office

The derivation of such strings typically involves a derivation such as (44a), with the structure in (44b). Here, $DP_1$ is *Joop* or *the White House*; Co is the specifying coordinative head (*ø*, *or*); and $DP_2$ is *our boss, (he) who is our boss* or *the house with the Oval Office*. I assume that the paratactic intonation is triggered by the specifying Co head.

(44) a. b-Merge(Co,$DP_2$)→Co'
d-Merge($DP_1$,Co')→CoP

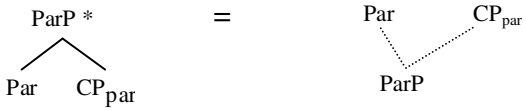
b.




### 4.4. Behindance-Merge and Parenthesis

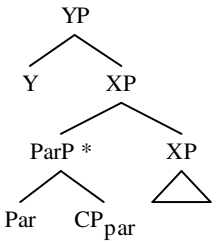
Now consider how a parenthetic clause ($CP_{par}$) attaches to a matrix clause. Its position within the host sentence is relatively free (Stoltenburg 2003; Schelfhout et al. 2003b) and it is somehow indifferent to the syntactic hierarchy of the matrix clause. Suppose (incorrectly, as it will turn out) that $CP_{par}$ is adjoined via b-Merge with the matrix VP. This gives [$_{VP*}$ CP VP]. But then not only $CP_{par}$ but also the existing part of the matrix clause (anything included in the VP) will be behind the node created (VP*). This cannot be correct. The solution is straightforward: a parenthetic clause is embedded in, say, a parenthetic phrase (ParP). The combination of ParP with $CP_{par}$ via behindance-Merge (45a) yields the structure in (45b).

(45) a. b-Merge(Par,$CP_{parenthesis}$)→ParP

b. 


ParP can then adjoin (by dominance-Merge) to some projection XP in the matrix. This would correspond to a derivation such as (46a) with the structure in (46b). (Here, only the star notation is used.)

(46) a. b-Merge(Par,$CP_{par}$)→ParP
d-Merge(ParP,XP)→XP+
d-Merge(Y,XP)→YP

b. 


Observe that Par and $CP_{par}$ are behind ParP. The c-command relations are as follows: Y c-commands XP+, ParP, and XP; ParP c-commands XP; Par c-commands $CP_{par}$. Crucially, neither Y nor XP c-commands the constituents of ParP, namely Par and $CP_{par}$, because these are not d-included in ParP. Furthermore, $CP_{par}$ does not c-command XP or a constituent of XP, for the simple reason that it is embedded.

What is ParP? It seems to be a monovalent coordination phrase. This is reminiscent of Munn (1993), who analyzes common coordination as (right)-adjunction of a monovalent Boolean Phrase BP)—which contains the conjunction and the second conjunct—to the first conjunct. However, there are crucial differences: (i) the contents of BP, but not ParP, are included in the syntactic dominance hierarchy; and (ii) Par, but not B, is a specifying conjunction.

In the analysis advanced here, like any coordinative head, Par triggers behindance. Furthermore, Par contains the same intonational trigger as a specifying coordinator. In this regard, it is telling that hedges can start with a coordinator, as in (47a). That an overt coordinator can appear before the parenthetic CP indicates that Par is spelled out as *and* in some cases. However, since specifying coordination is often asyndetically construed (i.e., it has no phonological content), it is not surprising that this also holds of parenthetic clauses (47b). Consistent with the present analysis, with some modifications a coordinator can be made visible (47c).[7]

[7] *So* in (47c) may be related to quotative operator, discussed in Collins and Branigan (1997), Schelfhout (2000), Corver and Thiersch (2002), and M. de Vries (2006b).

(47) a. Hank—and I hate to tell you this—stole my bike.
b. Hank, I think, stole my bike.
c. Hank, or at least so I think, stole my bike.

Since there are many types of parenthetic phrases, the complement of Par (here, CP) can have many different shapes; moreover, there can be ellipsis, etc. What is relevant here is that they all have a common basis, namely a phrase structure that involves behindance.

## 5. THE INVISIBILITY OF PARATACTIC MATERIAL

A parenthetic clause is behindance-Merged, and is outside the c-command domain of the matrix. Consequently, a constituent of $CP_{par}$ cannot be syntactically bound from outside. This is illustrated in (48) for quantifier binding:

(48) * Every$_i$ boy—(and) he$_i$ just ran away—had stolen an apple.

Similarly, a variable in an appositive relative clause cannot be bound by a quantifier in the matrix (49a). This contrasts with restrictive relatives, which are clearly subordinated, and which participate in quantifier-variable binding, (49b).[8]

(49) a. * Everybody$_i$ was talking about the Louvre, which he$_i$ visited yesterday.
b. Everybody$_i$ was talking about the museum that he$_i$ visited yesterday.

Since movement is always to a c-commanding position, we predict that movement out of a parenthetic clause is impossible. This prediction is confirmed:

(50) a. Lisa grumbled—who stole her bike, you know—all day long.
b. * Who$_i$ did Lisa grumble—t$_i$ stole her bike, you know—all day long?

(51) a. Hank saw Lisa, who carried a torch.
b. * What$_i$ did Hank see Lisa, who carried t$_i$ ?

While the anti-movement effects in (50) and (51) could be derived from island constraints, these examples are worse than standard island violations. I take this to indicate that something else is going on.

It seems that there are no c-command-based relations between paratactic material and constituents in the matrix sentence; I call this *invisibility* (M. de Vries 2007):[9]

[8] See Demirdache (1991) for similar data. The antecedent of an appositive relative is related to the relative pronoun via E-type anaphora, which is a discourse relation that does not involve syntactic binding. See Sells (1985) and Del Gobbo (2003).

[9] Invisibility is but one expression of the syntactic independence of paratactic material. It has also been claimed that parentheses have an independent illocutionary force, focus-background structure, and tense. See Espinal (1991), Pittner (1995), and Burton-Roberts (1999).

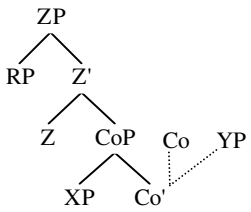
(52) *Invisibility of paratactic material:*
If B is paratactically construed with A (i.e., B is behind A), B is invisible to c-command relations with any object that is Merged with A or a projection that includes A.

The reverse is also true; this could be called *blindness of paratactic material*. No paratactically construed constituent B (or a constituent included in B) can c-command into the matrix clause. For instance, there is no movement into a parenthetic clause, nor is there any binding from within a parenthetic clause. This is trivial: because B is embedded—whether in a coordinate or a parenthetic phrase—the intended (movement or anaphoric) relation would be countercyclic.

How does behindance-Merge affect coordinate structures? Consider the derivation in (53a), and the corresponding structure in (53b).

(53) a. b-Merge(Co,YP)→Co'
d-Merge(XP,Co')→CoP
d-Merge(Z,CoP)→Z'
d-Merge(RP,Z')→ZP

b.




According to the definition of c-command in (33), YP (the second conjunct) 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 and Z. In other words, the line of dominance from ZP to YP is broken at Co'. XP (the first conjunct), however, is d-included in CoP, and therefore c-commanded by Z and RP and any phrase higher up in the matrix. Thus, we predict that the two conjuncts will behave differently relative to c-command relations:

(54) *Asymmetry Between Conjuncts:*
In a coordinate structure, the second conjunct but not the first is invisible for the syntactic context, in terms of c-command.

What is relevant here is the relation between the two separate conjuncts and the host context. Consider movement. Usually, movement out of a conjunct is impossible (55); this is the Coordinate Structure Constraint (Ross 1986).[10]

[10] An exception is Across-The-Board (ATB) movement, for example, *What did Peter buy _ and Bill sell _ ?* ATB is a more general phenomenon; for instance, ATB quantifier binding is also possible: *Every$_i$ man loves his$_i$ wife and his$_i$ children*; and so is ATB Case distribution: *I saw him and her.* It seems that the first conjunct can pass on properties to the second; how this can be explained is outside the scope of this article.

(55) a. * What did you buy _ and sell a book?
b. * What did you buy a book and sell _ ?

However, the Coordinate Structure Constraint does not apply to semantically asymmetrical coordination (Goldsmith 1985; Culicover and Jackendoff 1997; Van der Heijden 1999). Examples where a constituent is raised from the first conjunct are given in (56) for English and in (57) for Dutch.[11]

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

(57) *Dutch:*
a. Hoeveel chocola denk je dat je kunt _ eten en toch niet misselijk worden?
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 because 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?'

Movement from the second conjunct in similar sentences is impossible; this is shown in (58) for English, and in (59) for Dutch.[12]

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

(59) *Dutch:*
a. * Wat kun je een pond chocola eten en toch niet _ worden?
what can you a pound chocolate eat and still not _ become
*Intended:* 'What can you eat a pound of chocolate and still not become _ ?'

[11] Examples (56) and (57) cannot be analyzed as matrix CP coordination of a question with a proposition, with forward deletion into the second conjunct. There is no correspondence between what would be elided in the second conjunct and its antecedent in the first conjunct. For instance, in (57a) 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).

[12] Colloquial English and Afrikaans have a quasi-serial verb construction of the type *go and get*, as in *What did John go and get _?* If this is coordination of verbal heads (De Vos 2005), then it is not movement from a second conjunct. More problematic is the transitive variant, *What did John go to town and buy _?* I have no explanation for the latter, except to note that it is limited to a small number of predicates. See also Lakoff (1986) and Postal (1998) for discussion.

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
*Intended:* '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 was Joop still not left or _ bought an expensive gift
*Intended:* 'Who had Joop barely left before _ bought an expensive gift?'
d. * Wat was Joop nog niet vertrokken of Jaap heeft _ gekocht?
what was Joop still not left or Jaap has bought
*Intended:* 'What had Joop still not left before Jaap bought _ ?'

That extraction is possible from a first conjunct (56)–(57) but not from a second conjunct (58)–(59) is predicted by Asymmetry Between Conjuncts (54).

Asymmetry Between Conjuncts also holds of anaphora. I illustrate this with the complex pronoun *hemzelf* in Dutch, with is an identifying emphatic expression consisting of a pronominal part *hem* 'him' subject to Condition B, and an emphatic part *zelf*. As shown in (60), while *zichzelf* is a local anaphor, *hemzelf* is not.[13]

(60) *Dutch:*
Joop$_i$ beloonde zichzelf$_i$ /*hemzelf$_i$.
Joop rewarded SE-self / PRON-self
'Joop rewarded himself.'

In a coordinated DP, when *hemzelf* is the first conjunct, it cannot be bound (61a); when *hemzelf* is the second conjunct, it can be bound (61b). (See M. de Vries 1999 for a discussion of the discourse conditions that favour the use of an identifying emphatic expression over a simple pronoun in contexts such as (61b).)

(61) *Dutch:*
a. * Joop$_i$ beloonde hemzelf$_i$ en Anna rijkelijk.
Joop awarded PRON-self and Anna richly
*Intended:* 'Joop richly awarded himself and Anna.'
b. Joop$_i$ beloonde Anna en hemzelf$_i$ rijkelijk.
Joop awarded Anna and PRON-self richly
'Joop richly awarded Anna and himself.'

The contrast in (61) is consistent with Asymmetry Between Conjuncts. The first conjunct is visible to a c-commanding phrase, and so cannot be bound by the subject *Joop*; a Condition B effect. The second conjunct is not visible to a c-commanding phrase, and so can be bound by the subject.

We might expect the local anaphor *zichzelf* to give the opposite pattern, namely to be felicitous in the first conjunct, but not in the second conjunct. Instead, *zichzelf* may occur in either the first or the second conjunct (although I have a preference for (62a)).

[13] In some dialects of Dutch the reduced form *'mzelf* is used as an anaphor; this is not the relevant target here.

(62) *Dutch:*

a. Joop$_i$ beloonde zichzelf$_i$ en Anna rijkelijk.
Joop awarded SE-self and Anna richly
'Joop richly awarded himself and Anna.'

b. Joop$_i$ beloonde Anna en zichzelf$_i$ rijkelijk.
Joop awarded Anna and SE-self richly
'Joop richly awarded Anna and himself.'

Why is (62b) acceptable? Although (62b) is excluded if we use DP coordination, it has a possible analysis in terms of CP coordination, with forward ellipsis, as in (63) where *zichzelf* is 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.

(63) [Joop beloonde Anna] en [~~Joop$_i$ beloonde~~ zichzelf$_i$]
Joop awarded Anna and Joop awarded SE-self

Note that a CP analysis cannot be invoked for (61a), as in (64), because the first conjunct would in any case contain a violation of Condition B:

(64) * [Joop$_i$ beloonde hemzelf$_i$] en [~~Joop beloonde~~ Anna]
Joop awarded PRON-self and Joop awarded Anna

Support for the clausal analysis of (62b) comes from the fact that the appearance of *zichself* in the second conjunct is prohibited if a clausal analysis is impossible, as with with the Exceptional Case Marking constructions in (65) and (66).

(65) *Dutch:*

a. Op TV zag Agassi$_i$ zichzelf$_i$ 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$_i$ Sampras en zichzelf$_i$ een tenniswedstrijd tegen elkaar spelen.
on TV saw Agassi Sampras and SE-self a tennis.game against each.other play
*Intended:* 'On TV, Agassi saw himself and Sampras play a tennis game against each other.'

(66) *Dutch:*

a. Na de eerste zangles hoorde Joop$_i$ in gedachten zichzelf$_i$ en Pavarotti al een duet zingen.
after the first singing.lesson heard Joopin his.mind SE-self and Pavarotti already a duet 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$_i$ in gedachten Pavarotti en zichzelf$_i$ al een duet zingen.
after the first singing.lesson heard Joop in his.mind Pavarotti and SE-self already a duet sing
*Intended:* 'After his first singing lesson, Joop already heard himself and Pavarotti sing a duet in his mind.'

In the (b) examples, the use of *hemzelf* instead of *zichzelf* would make the sentence

acceptable. *Hemzelf* also makes a second reading available in (66b), in which Pavarotti sings a duet with himself, for example, as in a special effects film.

Thus, Asymmetry Between Conjuncts in (54) is corroborated by the anaphora data from Dutch. More generally, this supports the claim that that coordination and parenthesis are instances of the more general relation of parataxis.

## 6. CONCLUSION

Coordination differs from subordination. More generally, parataxis (of which coordination is a special case) differs from hypotaxis (of which subordination is a special case). Paratactic material has the following properties:

(i) it provides additional information;
(ii) it is not selected by any part of the matrix;
(iii) it is phonologically set off from the matrix by a low intonation;
(iv) it is linearly integrated with the matrix clause; and
(v) it is part of a complete syntactic object.

Models of syntax are largely designed to produce the hierarchical structures needed for hypotaxis. But this leaves open the question of how to produce the structures needed for parataxis. I have argued that *behindance* is the basic concept underlying parenthesis and coordination (with the latter subsuming common coordination as well as the specifying coordination relevant for apposition). It constitutes the third degree of freedom in syntactic phrase structure, the first two being dominance and precedence. Accordingly, phrase structure encodes three major asymmetrical relations. The first is dominance, and produces a syntactic hierarchy. The second is the selectional asymmetry between sisters, which is translated into precedence in the phonological component. The third is behindance, and leads to a paratactic hierarchy.

In a derivational grammar based on Merge, behindance can be implemented as a type of inclusion, called behindance-inclusion (b-inclusion). It is an alternative to dominance, which is equated with dominance-inclusion (d-inclusion). Moreover, c-command is restricted to instances involving d-inclusion. Consequently, paratactic construal is predictably invisible to c-command relations, as evidenced by the impossibility of movement out of a parenthetic clause or binding into a parenthetic clause.

In the present analysis, coordination is a syntactic configuration whose meanings reflect the properties of different coordinative heads. Some of the most important ones are listed in (67), which classifies the paratactic conjunctions discussed here. I have argued that that, in addition to conjunction and discussion, one must also recognize another type of coordination, namely specifying coordination, which includes apposition and parentheticals.

(67)

- Coordinative heads
  - conjunction (∧)
  - disjunction (∨)
  - specification
    - bivalent (&: Apposition)
    - monovalent (Parenthetic)
  - *other* (opposition, etc.)

All paratactic conjunctions project into a coordination phrase. On the phonological side, specifying coordination is associated with a paratactic intonation break. The heads &: and Par are often asyndetic (i.e., they have no phonological content), but are sometimes spelled out as regular coordinators such as *and* and *or*. The syntactic status of additional connecting phrases like *that is to say* is not clear to me at this point. Bivalent specification is used for apposition, monovalent specification for parenthesis. The latter has no anchor; parentheses are embedded in a parenthetic phrase, whose head is a monovalent specifying coordinator, with the parenthetic phrase as a whole adjoined to some projection of the matrix clause. Because parenthesis also involves adjunction, this points to a parallel with adverbial material.

There remains the question of the formal status of behindance. In the present analysis, the association between paratactic conjunctions and behindance-inclusion is not theoretically forced. I submit the following heuristic:

(68) Coordinative heads, and only coordinative heads, trigger the application of behindance-Merge.

Here, the *and only* clause prevents overgeneration of structures involving behindance-Merge. Thus, what all types of parataxis have in common is that the paratactic constituent is construed behind the projection of the coordinator that selects it, that is, Co— drawn for the set {∧, ∨, &:, Par}—and XP are all behindance-Merged.

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