Parataxis as a Different Type of Asymmetric Merge
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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 and coordination are analysed on the basis of behindance. In our derivational model of grammar it is defined as a special type of inclusion that blocks c-command. The linearization of these structures is performed by a standard algorithm that exploits the asymmetrical nature of Merge. It is predicted that parenthetic material can neither move toward the matrix, nor be bound by a constituent from the matrix; this leads to an asymmetry between first and second conjuncts.

1   Introduction and overview

Parataxis is the equipollent ranking of clauses or phrases; hypotaxis is the unequal ranking. Therefore, hypotaxis presupposes a syntactic hierarchy; by contrast, parataxis does not, or at least not in the same way. Prototypical examples of parataxis/hypotaxis are coordination versus subordination; see (1):

(1)   a.   The man was sitting and the woman was standing.   *(coordination)*
       b.   He couldn't come because he was ill.   *(subordination)*

However, the notions parataxis and hypotaxis comprise much more than that (see e.g. Quirk et al. 1985§13.2, Van Es & Van Caspel 1975, Schelfhout et al. 2003a). For instance, the relation between a predicate and its subject can be characterized as hypotactical. Examples of parataxis are parentheses and appositions; these are illustrated in (2–3):

(2)   *parenthesis (comment clause, hedge, appended clause, …)*
       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 weapens 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 clause*
       a.   She gave Joop, *our friend*, a present.
       b.   She gave Joop, *who is our friend*, a present.

Present-day (generative) syntax is predominantly preoccupied with hypo/hypertactic relations. With the exception of common coordination, a theoretical description of the phenomenon of parataxis is almost completely lacking in the literature, especially in the Minimalist Program. The reason is undoubtedly that this theory inherently produces hierarchical structures, usually indicated with simple tree diagrams or brackets. It is unclear how paratactic relations can be represented well. Therefore, it can be stated without exaggeration that there is a large void in the theory, for which a substantial solution must be found. The two fundamental questions I will address in this article are stated in (4):

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(4) a. How can the nonsubordinative properties of paratactic constructions be represented in syntax?
   b. Can we generalize over coordination and other types of parataxis?

Briefly summarized, Section 2 reviews the differences between hypotaxis and parataxis. It is concluded that we need a relation called 'behindance' for a correct description of paratactic phenomena – in addition to the more familiar dominance and precedence. Section 3 presents the theoretical implementation of the proposal in terms of Merge. Section 4 applies this theory to coordination and parenthesis. I argue that paratactic material is invisible for c-command-based relations. Section 5 is the conclusion.

2 Parataxis as behindance

2.1 Some properties of parataxis

There are some simple tests that distinguish syntactic coordination from subordination. For instance, in Dutch and German conjoined main clauses display V2, whereas subordinated clauses have V-final order. This is illustrated in (5):

(5) a. Karel keek   televisie en Joop las de krant.   [Dutch]
       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.'

Furthermore, conjoined DPs generally show the same Case, whereas a subordinated DP has oblique Case (determined by the preposition).[1] This can be shown in German; see (6):

(6) a. der Mann und die Frau   [German]
       the$_{nom}$ man and the$_{nom}$ woman
   b. der Mann mit dem Hut
       the$_{nom}$ man with the$_{dat}$ hat

Thirdly, coordination is category-neutral, whereas a subordinator selects a complement of a particular category:

(7) a. XP and XP   (where X = A, P, N, V, D, I, C, etc.)
   b. [P DP]; [C IP]

Fourthly, ellipsis is generally possible in coordinate structures, but not in subordinated clauses:

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

Fifthly, a conjoined phrase or a part of it cannot be moved (Ross's 1967 Coordinate Structure Constraint), but a subordinate phrase can (depending on the context, etc.):[2]

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[1] Nevertheless, instances of syntactically unbalanced coordination exist, as described in Johannessen (1998).

[2] Exceptions to the CSC are discussed in Section 4.3 below.

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

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

Sixthly, a coordinate structure is intuitively bivalent: the coordinator conjoins one phrase to another phrase. A subordinate structure is monovalent: the subordinator selects only one phrase; there is no such thing as a 'first subjunct'. If anything, the subordinatee is locally subordinated to the subordinator. The whole phrase is hypotactically inserted in the matrix (as a complement or an adjunct); hence indirectly the subordinatee is subordinated to the (higher part of the) matrix. This insight is sketched in (11), where the labels are arbitrary:[3]

(11) a.   [[XP] Co [YP]]
     b.   [$_{XP}$ X [$_{SubP}$ Sub [YP]]]

In short, there is a clear distinction between common coordination and subordination.[4]
     Let us turn from coordination to other types of parataxis, such as parentheses and appositions. These have the following properties:

(12) a.   They are not selected by any part of the matrix. 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 [see also Section 4];
            (iii) yet, they can be added on a constituent level.

Property (12c.i) implies that a paratactic phrase must be connected to its surroundings before Spell-Out (i.e. in overt syntax). Given a Y-model of grammar, and given that a paratactic phrase is pronounced, it cannot be the case that this phrase is added on a discourse level, or some other level beyond the LF interface, something which is assumed for appositive relative clauses in e.g. Fabb (1990) or Safir (1986). Reversely, given the fact that a paratactic phrase has a meaning, it cannot be the case, either, that it is introduced only after the PF interface, in the phonological component. This last point is strengthened by (12c.iii), a property which is intuitively clear for appositions and appositive relatives, but it is also valid for parentheses; for instance, (13a) is ambiguous between the paraphrases given in (13b.i/ii).

(13) 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.

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[3]   The distinction is blurred in Munn (1993) and Camacho (1997). This leads to severe problems; see Progovac (1998) and the references there. The main critique is that they account for special cases such as first conjunct agreement, but fail to explain the regular pattern well; for instance, *the man and the woman* is plural, but *the man with the green hat* is singular.

[4]   There are also two intermediate classes, namely nonparallel coordination and insubordination, which are the result of a mismatch between the syntax and the semantics of the construction. See e.g. Van der Heijden (1999) and Culicover & Jackendoff (1997) for discussion.

Here, (13b.i) reflects the constituent reading.

In short, parataxis must be represented in syntax. Paratactic material will be passed on to both the phonological and the semantic component.

2.2   *The relation between parenthesis and coordination*

The relation between parenthesis and coordination is not immediately obvious. However, consider the appositions in (14) and (15):

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

(15) a.   Fik is een hond, *en wel* een poedel.   [Dutch]
              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

In particular, notice the presence of the coordinators in (14d) and (15). The mere fact that coordinators can sometimes be used, strongly suggests that the appositive construction is a kind of coordination. Quirk et al. (1985:1301/2) state: "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."

In all the examples in (14) and (15) the second part specifies the first part. It can be claimed that, next to conjunction and disjunction, there is a third type of coordination, which designates specification. As far as I know, the concept of specifying coordination has been introduced first by Kraak & Klooster (1968:Ch11). The differences between the three types of coordination are determined by the particular coordinator. Specifying coordination can be explicitly indicated by a specifying phrase such as *or rather, namely, that is*, etc. depending on the exact semantic subtype, but often the connection is asyndetic, i.e. phonologically empty. 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, e.g. Delorme & Dougherty (1972), Halitsky (1974), Klein (1977), Doron (1994), Canac-Marquis & Tremblay (1997). Furthermore, Sturm (1986), Koster (2000a) and De Vries (2002) explicitly advance a coordination analysis of appositive relatives. If they are correct, it is only a small step toward parenthesis, which brings us back to Emonds (1979) in a way. I tentatively conclude that there may be a common ground to all types of parataxis. This is what I will call 'behindance', following the terminology of Grootveld (1994).

2.3   *Behindance*

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), taken from Progovac (1998:3), the necessary binding relation between the first conjunct and the anaphor in the second is blocked, given that binding requires c-command.

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

b. * Jovan$_i$ i   svoja$_i$ zena su stigli.   [Serbo-Croatian]
   Jovan and self's wife are arrived
   int. 'Jovan and self's wife have arrived.'

This can be confirmed in Dutch with the local anaphor *zichzelf*:[5]

(17) a. * Ik luisterde naar een gesprek   tussen Joop$_i$ en zichzelf$_i$.   [Dutch]
        I listened   to a conversation between Joop and SE-SELF.
     b. * Toon me Joop$_i$ of een foto   van zichzelf$_i$!
        Show me Joop or a   picture of SE-SELF!

Furthermore, I find quantifier binding between conjuncts unacceptable:[6]

(18) a. * Elke$_i$ man en zijn$_i$ vrouw gingen naar de film.   [Dutch]
        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
        int. 'All hundred children and their mother, please advance.'

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

(19) a.   Elke$_i$ man ging met zijn$_i$ vrouw naar de film.
     b.   Willen alle$_i$ honderd kinderen met hun$_i$ moeder naar voren komen?

Furthermore, movement from one conjunct to another is unacceptable:

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

Since movement to a non-c-commanding position is impossible, this can be explained (see also Section 3.3). Another argument involves the impossibility of licensing a negative polarity item in a second conjunct, e.g. *He chased nobody and no/*any dogs* (from Progovac 1998:3).

Although it is thinkable that there is a series of independent explanations for all these facts, there is a simple generalization that captures them all at once: there is no c-command relation between conjuncts. I conclude that the relation between conjuncts is paratactic.[7]

When a constituent seems to take the same position as another constituent hierarchically – with respect to the syntactic context in the matrix –, it can be viewed as being situated 'behind' the other. (Of course this is only a metaphor.) For instance, in (21a) *our boss* is behind *John*; in (21b) *Mary* is behind *Bill*, and *Sue* behind *Mary*.

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

[6] Progovac (1998) claims that examples like *every man and his dog left* can be explained by quantifier raising; see also Sauerland (2001). There is another complication, namely that 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 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.

[7] There is another potential solution for the c-command problem, as explained in Progovac (1998). It could be the case that both conjuncts are embedded 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, it has been shown that initial coordinators are different from regular conjunctions (See Johannessen 1998, Bredschneijder 1999, Hendriks & Zwart 2001, Skrabalova 2003, De Vries 2003, Hendriks, to appear). Second, I will show in Section 4.3 that there is an asymmetry between conjuncts that can only be explained if there is a paratactic relationship.

(21) a.   I greeted John, our boss.
      b.   Bill, Mary, and Sue went to the movies.

This intuition – at least for common coordination, as in (21b) – is expressed in different ways in e.g. 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 and G. de Vries is based on set union of 'reduced phrase markers' (in the sense of Lasnik & 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. Therefore, such an object is not 'tree-representable' in the usual way. Coordination is assumed to be sentential only, and the combined sentences can be viewed as occupying different 'planes'. Somewhat differently, Mu'adz allows for phrasal coordination, and defines planes explicitly. Moltmann further develops this approach; she formalizes it, making use of McCawley's (1968, 1982) graph theory, and distinguishes between 'm-planes', which relate to meaning, and 'f-planes', which relate to formal syntax. See also Rogers (2003) for a formal discussion of multidimensional graphs in general.

The theories cited have been called three-dimensional (3D) approaches to coordination, but Chris Wilder (p.c.) remarked that this is a meaningless metaphor. What could be relevant is that there is a 'behindance' relation between conjuncts. However, such a relation is completely lacking in e.g. Goodall's work, where the 3D part of the analysis is inferred from the absence of dominance and precedence. Grootveld (1992:70) even states that this means that he "does not take the third dimension seriously". Van Oirsouw (1987) heavily criticizes Goodall's '3D' approach to coordination, but Haegeman (1988:287) states: "As a general conclusion to my review I would like to stress the merits of Goodall's work. […] The problems raised […] are often matters of execution." Furthermore, Grootveld (1992) replies that the problems are not inherent to 3D. The source of these problems is (i) the rigid sentential analysis of coordination, (ii) the lack of a structural position for the conjunction, and (iii) the absence of an explicit behindance relation. In Section 4 I show how these issues can be solved. The general idea is to combine a CoP-analysis with a 3D structure.

It seems unattractive to complicate syntax in order to accommodate better for common coordination only. However, if I am correct that we can use behindance for all types of parataxis, the idea may be warranted. In the next section I will show how the concept of behindance can be formalized in a derivational grammar.

3   Theoretical proposal

3.1   Preliminary I: Basic syntactic relations are determined locally

Like dominance and precedence, behindance is determined locally.[8] Nonlocal relations can be inferred by transitivity only. This is important to keep in mind when we start talking about planes, as I will show.

Since independent relations are mathematically orthogonal to each other, we may set up a three-dimensional syntactic space, where the axes encode precedence, dominance and behindance, as in (22):

(22)   *dom*

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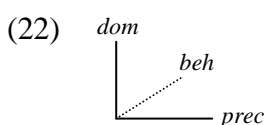
8   Notice that precedence and dominance parallel *minus* behindance ('beforeness'), strictly speaking. I do not wish to
       create additional confusion by altering the existing expressions, or by introducing new ones.

Of course, this space is abstract; it has nothing to do with the literal spacial relations length, width and height. The syntactic space in (22) can be used to draw syntactic graphs. As there are three dimensions, we get three-dimensional tree structures. Although this poses difficulties for drawings on paper, I think it is an insightful way to represent syntactic objects. However, we have to be careful with regard to trees – and other notations – because they may suggest properties or possibilities that do not exist.

The use of an axial system seems to imply that the nodes in a graph can be identified with 'absolute coordinates'. This, however, cannot be the case in syntax. A simple illustration in a 2D precedence-dominance system shows why; consider (23a/b):

(23) a.

b.
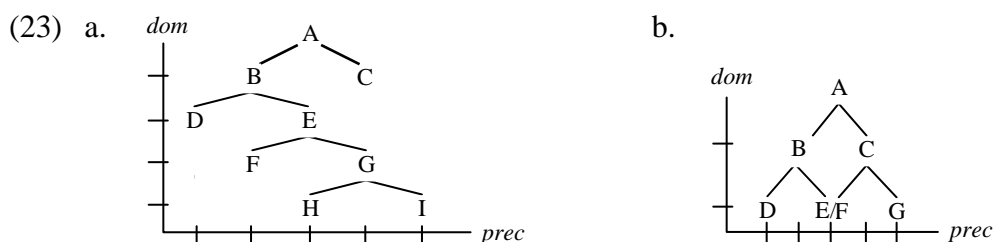
In terms of absolute coordinates I follows C in (23a), but this is at odds with standard conventions. In (23b) B is a complex specifier of F. Here, E and F have the same absolute coordinates, which is unwanted. One can draw lines of unequal length to suggest otherwise graphically (e.g. by extending the line between A and C). This amounts to doing away with absolute coordinates.

Trivial as it may seem, similar effects can be obtained in a 3D syntactic space. If, for instance, we replace the precedence axis in (23a/b) by a behindance axis, we do not want to say that node I is behind node C in (23a), or that E and F have the same absolute behindance coordinate in (23b). A concrete example of a situation like (23a) is a multiple coordination such as (24):

(24) either Hank and Richard and Bill, or Lisa

If conjuncts are behind each other (see Section 4 for structural details), then *Richard* is behind *Hank*, and *Bill* behind *Richard*; so if *Hank* is on the zero behindance level, then *Richard* has absolute behindance coordinate 1, and *Bill* 2. But *Lisa* is one step behind the complex [*Hank and Richard and Bill*], so it has absolute behindance coordinate 1. Hence *Lisa* would be as behind as *Richard*, but not as behind as *Bill*. This is not what we intend it to mean.

Thus, we arrive at an important conclusion: nodes cannot be assigned absolute (hence global) coordinates, but they are locally related by the notions dominance, precedence and behindance. Nonlocal relations must be inferred by transitivity. In (23a), C is related to (the complex) B, and I is related to H. There is no direct relationship between C and I; so the problem mentioned above does not arise.

Strictly speaking, it makes little sense to speak about (global) planes in connection with the third dimension. For instance, in (24) *Lisa* and *Richard* would be in a plane with absolute behindance coordinate 1. Similarly, the nodes on a vertical or horizontal line in a 2D structure are not (necessarily) related, e.g. C and G in (23a). Cross-sections in two- or three-dimensional syntactic graphs are arbitrary; they have no syntactic meaning.

3.2   Preliminary II: The independence of dominance and precedence

Syntactic relations depend on dominance (c-command, hierarchy). Many people reject syntactic rules that allude to linear order (the effect of precedence). Nevertheless, a common assumption is that syntax does encode precedence, i.e. the asymmetry between sister nodes, since the eventual linearization process must produce the correct linear order between the words in a sentence. A way to account for this in terms of the X-bar system is to assume a language-dependent head-complement parameter, or even a universally fixed specifier-head-complement order.

However, Kayne (1994) has claimed that precedence can be derived 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 maybe the second. Kayne's theory is formulated as the Linear Correspondence Axiom (LCA). Consider (25), a perfectly normal projection, in which YP is the specifier of X and ZP the complement. (Note that in Kayne's system a specifier is an adjunct; X-bar nodes do not exist.)

(25)
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        XP
       /  \
     YP    XP
     /\   /  \
        X    ZP
             /\
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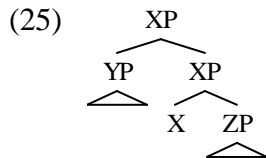
According to Kayne, the asymmetry between the sister nodes X and its complement ZP does not need to be stipulated, since X asymmetrically c-commands the components of ZP; hence (by the LCA) X will literally precede Z in the output string. The c-command relation between X and ZP itself is mutual, and therefore irrelevant to word order. Thus so far, antisymmetry seems to imply that the precedence relation is derived from the information on dominance. However, in half of the cases precedence information cannot be derived from dominance. Consider the specifier YP and its sister node, the lower segment of XP. Since both are complex, our first prediction is that YP and XP mutually c-command each other, and therefore no linear order between their terminals can be established. This is not the intended outcome; therefore, Kayne (1994:16ff) adds an ad hoc element; see the first proviso in the definition of c-command in (26):

(26) 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.

By definition, the lower XP in (25) is a segment and not a category. Therefore, it cannot c-command 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 either, since XP does not exclude YP.) Consequently, YP asymmetrically c-commands the components of XP, and the linear order can be established, as required. Now, notice that the whole point of the stipulation that a segment cannot c-command (26.i) is to create an asymmetry between the sister nodes YP and XP (which leads to the correct word order, ultimately). Surely, this asymmetry is equivalent to abstract precedence. In conclusion, Kayne's definition of asymmetrical c-command contains a notational variant of precedence.

    In Chomsky's (1995) Minimalist Program, precedence is not part of the core syntax. He relegates word order to the phonological component. This is in contradiction to the work of Kayne, who places the conditions on basic word order 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. As expected, Chomsky faces the same problem as Kayne. Recall that an XP segment in Kayne's theory is X-bar in Chomsky's work. Following Kayne, Chomsky explicitly excludes X-bar nodes from c-command. Such a move amounts to the same as the stipulation in (26i). (In e.g. *Barriers* (Chomsky 1986) there is no such claim.) Moreover, if Epstein (1999) is right that c-command is derived automatically in the course of the syntactic derivation – in a few words, if X and Y are Merged, c-command is the total relation between X on the one hand, and Y and all its constituents on the other hand – then hedges such as (26.i) are impossible.[9] Thus, we cannot say that precedence follows from dominance; it is an independent relation.

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[9]   Actually, Epstein uses the word *category*, but it plays no role in his discussion. Furthermore, Merge is not asymmetrical in Epstein (1999). Nevertheless, his basic ideas can easily be translated into the framework presented here; see further Section 3.3.

Koster (1999, 2000b) identifies precedence as one of the basic properties of the "Configurational Matrix", which says that universally, syntactic structures are formed as: [$_\beta$ α δ]. Here, δ is an element that depends on α, the antecedent (in the broadest possible sense). This configuration applies to e.g. anaphora, but also to Chomsky's operation Merge. Zwart (1999) comments that the Configurational Matrix should have two and preferably only two properties: bi-uniqueness (i.e. one α relates to one δ) and asymmetry. In terms of Merge we may say that α is added to the target δ. So the asymmetry between sisters concerns the question what selects what. According to Jan Koster (p.c.) this can be seen as 'relative aboutness'. This asymmetry is the second degree of freedom in syntax; I will call it precedence, following traditional terminology. Of course, precedence in syntax is the abstract asymmetry between α and δ; it is only during the process of linearization that abstract syntactic precedence is translated into literal precedence between the elements in a string. (As I see it, the apparent controversy between Koster and Zwart on precedence is only a matter of terminology.)

From the discussion above, it follows that Merge is not 'set Merge' as proposed by Chomsky (1995:243). If A and B are Merged, they are combined as an ordered pair <A,B>. This is also claimed by e.g. Koster (1999, 2000b), Zwart (1999, 2003) and Langendoen (2003). In a tree structure, A is to the left of B; this notation is equivalent to the ordered set notation.

3.3   Preliminary III: properties of Merge

A syntactic derivation has to make use of a structure building operation. Chomsky (1995) calls this operation Merge. If we have binary branching, Merge combines two syntactic objects into a larger object. Usually, one distinguishes between Merge and Move, but this terminology is inaccurate, strictly speaking, since Move involves Merge; only the input is different. Actually, there are eleven logical possibilities – even if we presuppose strict cyclicity – considering that an input object (i) can be selected from the lexicon (or numeration), (ii) can be a partial derivation from the syntactic work space, and (iii) can be a constituent of a partial derivation in the syntactic work space. Five of these are considered impossible. See (27), where partial derivations are phrases (abstracting over X' and XP, if there is such a difference), a constituent can be a head or a phrase, and the lexicon contains heads (X), to keep it simple.

(27)   *Possible instances of Merge(X(P), Y(P))*

		X(P)	Y(P)	abstract example	usually named
a.		lexicon	lexicon	[X Y]	Merge
b.		lexicon	partial derivation	[X YP]	Merge
c.		partial derivation	lexicon	[XP Y]	Merge
d.		partial derivation	partial derivation	[XP YP]	Merge
e.		constituent of YP	partial derivation	[X(P)$_i$ [$_{YP}$ … t$_i$ …]]	Move
f.		partial derivation	constituent of XP	[[$_{XP}$ … t$_i$ …] Y(P)$_i$]	Move
g.	*	constituent of ZP	partial derivation	[X(P)$_i$ YP]	–
h.	*	constituent of ZP	lexicon	[X(P)$_i$ Y]	–
i.	*	partial derivation	constituent of ZP	[XP Y(P)$_i$]	–
j.	*	lexicon	constituent of ZP	[X Y(P)$_i$]	–
k.	*	constituent of WP	constituent of ZP	[X(P)$_i$ Y(P)$_k$]	–

Which of the two input objects projects is also important, but that is another matter, as is the discussion on the necessity of a label (see Chomsky 1995, Collins 2002); I will leave these matters aside. The reason why the last five options are excluded is probably that the moved objects do not c-command their original positions. This raises two immediate questions.

First, how do we recognize a moved object, if Move is only an instance of Merge? The difference between a constituent on the one hand and a partial derivation or an element from the

lexicon on the other hand, is that the first has already been merged. So we can identify Move as an instance of 'remerge'.[10]

Second, what exactly is c-command? Following the basic idea of Epstein (1999), I will define c-command on the basis of Merge. Words and phrases are hierarchically related automatically during the course of the syntactic derivation:

(28) *C-command (preliminary version):*[11,12]
 If Merge(A,B) then A c-commands B and all the constituents included in B.

The c-command relation is total: A c-commands B and everything included in B. (Notice that inclusion is a transitive relation; if A includes B and B includes C, then A includes C.) Furthermore, since Merge handles the input objects asymmetrically, as argued in the previous section, c-command as defined here is asymmetrical, too.[13] In the next section I will propose a subtle modification of (28).

Let me conclude this section by listing the properties of Merge. Notice that several basic conditions on syntactic phrase structure are built into the definition of Merge.

(29) *Properties of Merge*
 a. Merge combines syntactic objects into one larger object. *[structure building]*
 b. The input objects are included in the output object. *[hierarchy]*
 c. An input object is *[free selection]*
  (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.
 d. Merge takes two input objects. *[binary branching]*
 e. The output of Merge is an independent syntactic object. *[strict cycle condition]*
 f. The output of Merge is an ordered pair. *[selectional asymmetry]*
 g. If Merge (A,B) then A c-commands B and all the constituents *[c-command]*
  included in B
 h. A remerged object must c-command its origin. *[no movement from independent partial derivations]*

The next sections show how behindance can be treated in terms of Merge.

3.4 Behindance as b-inclusion

In the previous 3D accounts cited, behindance is implicitly rendered as an alternative for precedence. (This would mean that there are two ways of producing an ordered pair.) Some additional assumptions have to be made for the linearization.[14] Crucially, conjuncts are treated

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[10] 'Sharing' or 'multi-dominance' or 'grafting' (as proposed by McCawley 1982, Muádz 1991, G. de Vries 1992, Van Riemsdijk 1998 and others) would also be an instance of remerge. It could be used to explain Right Node Raising, for instance. I am sympathetic to this idea, but unfortunately it is outside the scope of this article.

[11] I will not use the notion *term*, which only means "constituent included in".

[12] We can translate (28) into a representational definition: A c-commands B iff there is an X, X is B or X includes B, for which holds: X is directly preceded by A.

[13] As far as I can see, this is correct if specifiers and heads universally precede intermediate categories (predicates) and complements, respectively (cf. Kayne 1994). Nevertheless, if the claims about a universal X'-schema turn out to be wrong, the definition of c-command in (28) can easily be adjusted to: "if Merge(A,B) then A c-commands B […] *and* B c-commands A […]".

[14] The algorithm that scans a syntactic structure and produces a (linear) string out of it has an additional rule that recognizes behindance. In terms of tree structures, it could work like this: go to a daughter node, but 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. In the case of binary branching, sister nodes are organized either left-right or front-back. This gives a

symmetrically. All conjuncts are dominated by nodes higher up in the matrix clause. As a consequence, it is unclear to me how instances of parataxis other than common coordination can be captured.

I argue that there is a much more interesting way of representing behindance, namely as an alternative for dominance. This means that we have to consider inclusion. If the syntactic objects A and B are included in a more complex object C, C is assumed to dominate A and B. I will equate dominance with the term d-inclusion. (The former suggests a top-down perspective, the latter a bottom-up perspective.) My basic proposal is I very simple: *by assumption, there is a second type of inclusion, called b-inclusion.*[15]

Inclusion is still a transitive relation: if A x-includes B and B x-includes C, then A x-includes C. C-command is now reformulated as (30):

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

As a result, behindance blocks c-command relations. In the following sections we will see that this makes parataxis asymmetrical.

3.5   *d-Merge and b-Merge*

The hierarchy property of Merge (29b) refers to inclusion. If there are two types of inclusion, there will automatically be two types of Merge:

(31) *Two types of Merge*
       a.   d-Merge: the input objects are d-included in the output object.   *[syntactic hierarchy]*
       b.   b-Merge: the input objects are b-included in the output object.   *[paratactic hierarchy]*
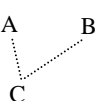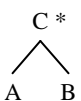
The 'normal' d-Merge gives the regular syntactic hierarchy; b-Merge produces a 'paratactic hierarchy'. (Recall from Section 2 that parataxis is more than nothing, and is sensitive to constituency.)

The representation of syntactic objects requires some notation. We can draw a tree structure, or use sets, but we can also compile a list of local relations; see (32) and (33). In the intended interpretation these notations are completely equivalent.

(32) The result of *d-Merge (A,B)* $\rightarrow C$ in different, arbitrary notations:
       a.   C   b. $[_C$ A, B $]$ c.   A precedes B
              /\   C dominates A
             A   B   C dominates B

(33) The result of *b-Merge (A,B)* $\rightarrow C$ in different, arbitrary notations:
       a.   A   B   b.   C *   c. $<_C$ A, B $>$ d.   A precedes B
                                      /\   A is behind C
   C   A   B   B is behind C

In (33a) the dotted lines are meant to suggest a 3D drawing, so that A and B are behind C; in (33b) the different type of hierarchy is indicated simply by a star next to the projection C. In (33c) the paratactic hierarchy is indicated by the use of angle brackets instead of square brackets; in (13d) the local relations are directly listed.

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three-dimensional graph that does nothing special at all (without further assumptions), so we might as well convert it to a regular 2D structure.

[15]   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.

Consider a slightly more complicated structure in which one of the Merge operations is b-Merge, i.e. where behindance is involved. The object in (34) is created by the subsequent operations d-Merge(A,B)→C, b-Merge(D,C)→E, and d-Merge(F,E)→G.

(34)
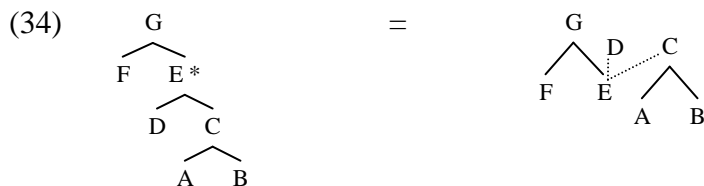
According to the definition in (30), A c-commands B; D c-commands C, A and B (because A and B are d-included in C); and F c-commands E, but nothing else, because D and C are not d-included in E. The last fact is exactly what we need. In (34) the normal dominance hierarchy is interrupted at point E; hence the constituents of E are in a 'paratactic' relation to the higher nodes.

Section 4 shows how we can apply this theory to coordination and parenthesis, but first let us consider how the linearization of 3D structures such as (34) can be established.

3.6 Linearization

At some point beyond syntax, in the phonological component, the syntactic structure must be linearized in order to be pronounced. This means that the words (terminals) are put in a string. The use of three-dimensional graphs potentially complicates the linearization. However, given the theory outlined above, it turns out to be completely straightforward.

The standard recursive algorithm that scans a tree is informally rendered in (35). It necessarily makes use of information on constituency (inclusion), and on the asymmetry between sisters (precedence). The object is scanned top-down in the sense of the most inclusive to the least inclusive (the 'terminals' or heads).

(35) a. <u>algorithm "linearization"</u>
          create a new, empty string
          "scantree"
          end

      b. <u>procedure "scantree"</u>
          if the present object (directly) includes members
              then if these are ordered by precedence,
                        then do "leftright"
                        else do not
              else add the present object to the string

      c. <u>procedure "leftright"</u>
          select the preceding member
          "scantree"
          select the other member
          "scantree"

Importantly, inclusion generalizes over b-inclusion and d-inclusion. Thus, whether members are 'behind' or 'below' the larger object is irrelevant.

As an example, consider how the structure in (34) is turned ito a string. We start at the top. G has ordered members. We turn to F, the preceding one, first. F is not complex, and we add it to the string. We return to where we were and try the other member of G, this is E. E has ordered members; we turn to D first. D is not complex, and we add it to the string. We return to where we where and try the other member of E; this is C. C has ordered members; we turn to A first. A is not complex, and we add it to the string. We return to where we where and try the other member of C;

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this is B. B is not complex, and we add it to the string. We return to where we were; "scantree" of G is completed and we end the algorithm "linearization". The output string is [F D A B], as required.

I conclude that the structures produced by the '3D grammar' proposed can be linearized by a standard tree scanning algorithm; no additional assumptions are required.[16]

4   Coordination and Parenthesis

4.1   Coordination

A simple coordination consists of two conjuncts and a conjunction. The conjunction, e.g. *and*, is a functional head (Munn 1987, Johannessen 1998, Van der Heijden 1999), which I will call Co. It combines with the second conjunct to form Co'. Then the first conjunct is Merged with Co', which projects; this gives CoP. As discussed in Section 2.3, the second conjunct cannot be hierarchically subordinated as in $[_{CoP}XP_1 [_{Co'} Co\ XP_2]]$; rather, it is paratactically construed. A simple solution in terms of the theory developed above is the following derivation: b-Merge(Co,XP$_2$)→Co', d-Merge(XP$_1$,Co')→CoP. This is shown in (36):

(36)
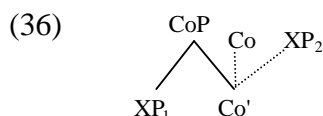
The structure is binary branching. Co and XP$_2$ are behind Co'; therefore they are not c-commanded by XP$_1$. Furthermore, $[_{Co'} Co\ XP_2]$ is a constituent (and of course $[_{CoP} XP_1\ Co\ XP_2]$, too), but $[XP_1\ Co]$ is not a constituent. This asymmetry was noted in Ross (1967); it is illustrated in (37–39) (my examples):

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

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

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

A slightly more complicated illustration is provided in two different notations in (40), where the first conjunct is a coordinate structure itself.

(40) ((Jaap and Joop) or Joep)

=
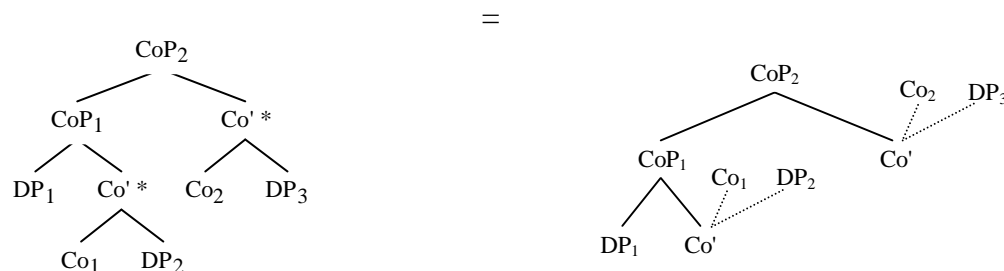
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[16]   The processing time of the algorithm in (35) grows linearly with the size of the input object. This is an advantage over an exponentially growing procedure like Kayne's Linear Correspondence Axiom, which can be implemented as a filter (for 2D structures); see De Vries (2002a:7ff).

The derivation is given in (41):

(41) b-Merge(Co_1,DP_2)$\rightarrow$$Co'_1$
     d-Merge(DP_1,Co'_1)$\rightarrow$$CoP_1$ b-Merge(Co_2,DP_3)$\rightarrow$$Co'_2$
     d-Merge(CoP_1,Co'_2)$\rightarrow$$CoP_2$

There are no planes, just local relations. Co_1 (*and*) and DP_2 (*Joop*) are construed behind Co_1'; somewhat sloppily it can be said that DP_2 is paratactically related to DP_1 (*Jaap*). Similarly, DP_3 (*Joep*) is paratactically related to the complex CoP_1 (*Joop and Jaap*). I suppose the example is self-explanatory. A more elaborate discussion, which includes initial coordinators and distributivity effects, can be found in De Vries (2003).

4.2 Parenthesis

So far, we have discussed common coordination. In Section 2.2 I argued briefly that some types of parenthesis can be captured directly under coordination if we allow for a third type of coordination called specification. These types are appositions and appositive relative clauses. Some examples are repeated in (42):
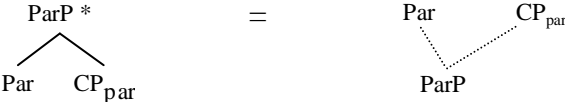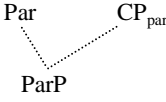
(42) a.   Joop, our boss
      b.   Joop, (i.e. he) who is our boss
      c.   the White House, or the house with the Oval Office

Thus, the general structure equals (36), as is shown in (43):

(43)   CoP   b-Merge(Co,DP_2)$\rightarrow$Co'
        Co DP_2 d-Merge(DP_1,Co')$\rightarrow$CoP
       / \
    DP_1 Co'

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.

    Now let us consider how a parenthetic clause CP_{par} can be attached to the matrix. We know that it can be inserted at various positions (see e.g. Schelfhout et al. 2003b), and that it is somehow withdrawn from the syntactic hierarchy of the matrix. Therefore, assume that CP_{par} is in an adjunction position, and that it is b-Merged. However, if we b-Merge CP_{par} directly with a projection of the matrix, the existing part of the matrix itself would be behind the node created. For instance, b-Merge(CP_{par},VP)$\rightarrow$VP+ would give *CP_{par} precedes VP, CP_{par} is behind VP+, VP is behind VP+*. This cannot be correct, of course. The solution to this problem is straightforward, in principle: a parenthetic clause could be embedded in, say, a 'parenthetic phrase' ParP; see (44):

(44)   ParP *   =   Par CP_{par}
        / \
     Par CP_{par} ParP

The projection in (44) is the result of b-Merge(Par,CP_{par})$\rightarrow$ParP. Consequently, ParP can be adjoined (by normal d-Merge) to some projection XP in the matrix, as is shown in (45), where I use the star notation for convenience:

(45) YP
     / \
    Y   XP
       / \
   ParP * XP
    / \   △
  Par CP$_{par}$

b-Merge(Par,CP$_{par}$)→ParP
d-Merge(ParP,XP)→ XP+
d-Merge(Y,XP)→YP

What is special is 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.

What is ParP? It seems to be a monovalent coordination phrase. Like any coordinative head in the analysis advanced here, Par triggers behindance. Furthermore, Par contains the same intonational trigger as a specifying coordinator. Perhaps it is also telling that hedges can start with a coordinator; see (46) for instance:

(46)   Hank – and I hate to tell you this – stole my bike.

The fact that we can insert an overt coordinator in front of the parenthetic CP suggests that Par can be spelled out as *and* in some cases. However, since specifying coordination is often asyndetically construed (see Section 2.2 above), it is not surprising that this is also the case for parenthetic clauses. An example is (47a). With some modifications a coordinator can be made visible; see (47b):[17]

(47)   a. Hank, I think, stole my bike.
       b. 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. I cannot possibly go into the details of all these constructions. What is relevant here, is that they have a common basis, namely a phrase structure that involves behindance.

4.3   The invisibility of paratactic material

A parenthetic clause is b-Merged, and therefore it is outside the c-command domain of the matrix, as explained in (45) above. As a consequence, a constituent of CP$_{par}$ cannot be syntactically bound from outside its own clause. This is illustrated for quantifier binding in (48):

(48)   * Everybody$_i$ – (and) he$_i$ just ran away – stole a bike.

Similarly, a variable in an appositive relative clause cannot be bound by a quantifier in the matrix, as opposed to the situation in restrictive relatives (which are clearly subordinated):

(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.

See e.g. Demirdache (1991) for similar data.[18]

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[17]   Schelfhout (1998) and Corver & Thiersch (2002) argue that a parenthetical clause like *I think* in (47a) is introduced by an abstract operator with the meaning of *so*; compare Collins & Branigan's (1997) quotative operator. In (47b) *so* is overt.

[18]   The connection between the antecedent of an appositive relative and the relative pronoun is an instance of E-type anaphora – a discourse relation. It does not involve syntactic binding. See also Sells (1985) and Del Gobbo (2003).

Furthermore, we predict that movement out of a parenthetic clause is impossible; see (50) for instance, which is completely unacceptable:[19]

(50) a. * Who$_i$ did Hank – (and) t$_i$ hate(s) to tell her this – steal/stole Lisa's bike?
      b. * What$_i$ did Lisa – (and) you know Hank steal/stole t$_i$ – grumble(d) all day long?

The derivation of these sentences would not be countercyclic; however, recall the property of Merge in (29h): a remerged object must c-command its origin. Since the line of dominance (d-inclusion) is interrupted in (50), *who* and *what* are moved to (i.e. remerged at) non-c-commanding positions, which is ruled out.

In general, it can be stated that paratactic material is syntactically 'invisible' for the matrix. This is conclusion is highlighted in (51):

(51) *Invisibility of paratactic material*
      If B is paratactically construed with respect to A (i.e. B is behind A), it is shielded from c-command-based relations with any object that is Merged with either A itself or some projection that includes A.

The reverse is also true; this could be called 'blindness of paratactic material': no parenthetically construed constituent B, or a constituent included in B, can c-command into the matrix. For instance, there is no movement into, or binding from within a parenthetic clause. As a matter of fact, this is trivial because B is embedded (whether in a CoP or in a ParP); therefore, the intended relation would be countercyclic.

How do the consequences of b-Merge affect coordinate structures? To see this, consider the derivation in (52):

(52)

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

According to the definition of c-command in (30), 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 the following:

(53) *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.

This asymmetry shows itself in several ways. The lack of c-command between conjuncts has already been discussed in Section 2.3. What is relevant here is the relation between the two separate conjuncts and the context. First consider movement. Usually, movement out of a conjunct is impossible; as mentioned before, this is known as the Coordinate Structure Constraint (Ross 1967):[20]

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[19] Movement out of an appositive relative is also unacceptable, but the same is true for restrictive relatives; this is a consequence of the Complex NP Constraint, or whatever underlying mechanism produces this effect.

[20] An exception to this rule is Across-The-Board movement, e.g. *What did Peter buy _ and Bill sell _ ?*. Across-the-board is a more general phenomenon; for instance, ATB quantifier binding is also possible: *Every$_i$ man loves his$_i$*

(54) 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 (see Goldsmith 1985, Culicover & Jackendoff 1997, Van der Heijden 1999). Some examples in which a constituent is raised from the first conjunct are given in (55) and (56):[21]

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

(56) 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 (57) and (58):[22]

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

(58) a. * Wat kun je een pond chocola eten en toch niet _ worden?   [Dutch]
     what can you a pound chocolate eat and still not   become
     int. '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
     int. '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
     int. '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
     int. 'What had Joop still not left before Jaap bought _ ?'

The contrast between (55/56) on the one hand and (57/58) on the other hand are in accordance with the prediction in (53).

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wife and his$_i$ children. It seems that the first conjunct can pass on properties to the second conjunct. How this can be explained is outside the scope of this article.

[21] Notice that (55) and (56) cannot be analysed as matrix CP coordination of a question with a proposition, with forward deletion into the second conjunct. Namely, there is no correspondence between what would be elided in the second conjunct and its antecedent in the first conjunct. For instance, in (56a) 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).

[22] 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 connected at the word level, this is not an example of movement from a second conjunct. This conclusion is corroborated by De Vos (2004).

The asymmetry between conjuncts can also be illustrated by the Binding Theory, which is dependent on c-command. I will do so by using the complex pronoun *hemzelf* in Dutch. It is an 'identifying emphatic expression' that 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 (59):[23]

(59) Joop$_i$ beloonde zichzelf$_i$ /*hemzelf$_i$.   [Dutch]
      Joop rewarded   SE-SELF   /   PRON-SELF
      'Joop rewarded himself.'

Now consider the following contrast:

(60) a. * Joop$_i$ beloonde hemzelf$_i$ en Anna rijkelijk.   [Dutch]
         Joop awarded   PRON-SELF and Anna richly
         int. 'Joop richly awarded himself and Anna.'
     b.   Joop$_i$ beloonde Anna en hemzelf$_i$ rijkelijk.

If *hemzelf* is the first conjunct, as in (60a), the sentence is excluded by Condition B – compare (59). If, however, *hemzelf* is the second conjunct, as in (60b), the sentence is acceptable.[24] 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 (61):

(61) a. Joop$_i$ beloonde zichzelf$_i$ en Anna   rijkelijk.   [Dutch]
         Joop awarded   SE-SELF   and Anna   richly
         'Joop richly awarded himself and Anna.'
     b. Joop$_i$ beloonde Anna en zichzelf$_i$ rijkelijk.

As expected, (61a) contrasts with (60a). Why then is (61b) acceptable (although I have a preference for (61a))? The reason is probably the following: although (61b) is excluded if we use DP coordination, it has a possible analysis in terms of CP coordination, with forward ellipsis:

(62) [Joop beloonde Anna] en [~~Joop$_i$ beloonde~~ zichzelf$_i$]

In (62) *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. Just to be clear, a CP analysis cannot save (60a); this is illustrated in (63):

(63) * [Joop$_i$ beloonde hemzelf$_i$] en [~~Joop beloonde~~ Anna]

Here, the first conjunct contains a violation of Condition B.

The possibility of an anaphor in a second conjunct disappears if a CP analysis is semantically impossible, for instance in the ECM constructions in (64) and (65).

                                                              [Dutch]

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[23] 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.

[24] Discourse conditions favor the use of an identifying emphatic expression over a simple pronoun here. See De Vries (1999) for a discussion of these conditions.

(64) 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.

(65) a.　Na de eerste zangles hoorde Joop$_i$ in gedachten zichzelf$_i$ en Pavarotti al een duet zingen.
　　　after the first singing.lesson heard Joop in 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.

In the b-examples, the use of *hemzelf* instead of *zichzelf* makes the sentence acceptable. *Hemzelf* would also make a second reading available, in which e.g. Pavarotti sings a duet with himself, as in a special effects film.

In sum, the asymmetry between conjuncts predicted in (53) is corroborated by the anaphora data from Dutch presented here. In general, it confirms the idea that we can generalize over coordination and parenthesis.

5　Conclusion

Coordination differs from subordination; more generally, parataxis differs from hypotaxis. Paratactic material provides additional information; it is not selected by any part of the matrix. It is phonologically set off from the matrix by a low intonation. Yet, it is linearly integrated with the matrix, and it must be part of the complete syntactic object. This raises the question how parataxis can be treated in syntax, which is standardly designed to produce the hierarchical structures needed for hypotaxis. I have argued that the basic concept underlying both parenthesis and coordination is 'behindance', which constitutes the third degree of freedom in syntactic phrase structure (the first two being dominance and precedence).

Thus, syntactic phrase structure encodes three major asymmetrical relations. The first, dominance, produces a syntactic hierarchy. The second is the selectional asymmetry between sisters, which is translated into literal precedence in the phonological component. The third, behindance, leads to a paratactic hierarchy. I have shown that the linearization of these structures can be performed by a standard algorithm.

In a derivational grammar based on Merge, behindance can be implemented as a special type of inclusion, called b-inclusion. It is an alternative for dominance, which is equated with d-inclusion. C-command is defined over d-inclusion. As a consequence, paratactic construal blocks relations based on c-command. Thus, the fact that movement out of a parenthetic clause or binding into a parenthetic clause is ungrammatical can be accounted for. Furthermore, the conjuncts in a coordinate structure are expected to behave differently with respect to the context: a second conjunct is syntactically 'invisible' but a first conjunct may enter in a c-command-based relation. These predictions are substantiated with data from Dutch.

Although common coordination seems different from parenthesis, there is an intermediate type that clearly has properties of both; this is specifying coordination, which captures appositions and appositive relative clauses. The differences between common and specifying coordination must be attributed to the coordinator, which can be abstract in the latter case. I have suggested that parentheses are embedded in a so-called parenthetic phrase, of which the head can be identified as a monovalent specifying coordinator. The parenthetic phrase as a whole can be adjoined to some projection of the matrix. 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/Par and XP$_{par}$ are b-Merged.

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