Some remarks on asymmetrical coordination

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1. Introduction: Coordination

1.1. Desideratum. Since at least 1985 there have appeared proposals in both GB as well as unification-based literature that the conjunctions themselves be regarded as severely underspecified feature bundles acting as identity operators with respect to bar-level (in the sense of X-bar theory of syntactic projection) and certain categorial features. 1 (K^{0} = head unspecified for category or bar-level features)

(1)
$$[K'_{(i,e,a,V')} V'_{i} [K'_{K}] \text{ and } V'_{i}]]$$

This concept of coordination was originally at odds with the rest of X-bar theory, but now, in the wake of much work on functional categories, it begins to fall into place conceptually. In current terminology conjunctions are functional categories which act as identity operators², just as in the case of other functional categories like negation:

where not leave today, like leave today, is a VP, but with an additional feature, say [+neg].

At first glance, such an approach is intuitively appealing, and it has been noted that there are numerous arguments for the above structure, including among others facts from Binding Theory, an explanation for Across-The-Board restrictions on extraction, cliticization, and the observation that there are languages like Japanese which have the mirror image structure. In addition we have an immediate explanation for the categorial and bar-level status of the conjunct as a whole (i.e., why $[X_1 \text{ and } X_2]$ "is-an" X), as well as readily imaginable accounts of iterated coordination in terms of feature inheritance (if [and X] allows an X in

Thiersch(1985), and more recently Kolb & Thiersch (1991), Paritong (1992), Rothstein (1991), Munn (1992), Oishi (1992). Many thanks to Hap Kolb, Tilman Höhle and the members of the Werkverband Grammatika Modellen in Tilburg for judgements and discussion, and to Marc van Oostendorp and Chris Sijtsma for WP5.1

with respect to bar-level and category features, not semantics.

its "Specifier" position then so does [X [and X]] or the lack thereof (both subcategorizes for a complement with the relevant feature of [X [and X]] and cannot take a "Specifier". And we can uphold the hypothesis that coordination, as has been proposed and widely assumed for other syntactic constituent structure, consists of only binary branching.

1.2 Counterexamples. In spite of the advantages noted in the literature for such an approach, and its conceptual appeal in terms of both GB theories about functional categories as well as HPSG feature inheritance, work on reconciling this approach with the enormous literature on the properties of coordination is still in its infancy, and there have appeared numerous problems in working out the details, beginning with the now notorious examples of the following sort:

(3) Bush is $\left[_{\alpha} \right]_{DP}$ a Republican and $\left[_{PP} \right]_{PP}$ in deep trouble].

The feature composition of the node α is unclear: on the one hand, we would like to say that the constituent [and X] is an X with the additional features of the conjunction via unification (as in the above example with negation), but if we regard the constituent α as resulting from a unification of certain features of the satellite constituents, the question arises as to what syntactic features (in the sense of distinctive feature theory) are relevant for coordination.⁴

Furthermore, there are all sorts of exceptions to ATB-extraction, as has been noted repeatedly in the literature, from both the first and the second conjunct:

- (4) a What did you go to the store and buy —?
 - b The heavy bag, John dropped to the floor and ran for his life⁵

Finally, there are examples like (5) of the sort discussed in Höhle (1990), which can be shown to have the structure in (6b) rather than (6a):

³ Using the term Specifier strictly in its structural sense; multiple specifiers are licensed just under the conditions stated in the text.

⁴ This problem lead earlier authors such as Sag, *et al.* (1985) to propose additional features such as [+PRD], and that the process for combining was subsumption. Paritong (1992) leaves the issue unresolved, saying that the features on the mother are some (further unspecified) function of those on the daughters. Thiersch (*in prep.*) suggests (see also footnote 16 below) that it is only the "functional" features of DP, CP which play a role in coordination, and there is no reference to, or percolation of, the lexical head features.

⁵ After Heycock & Kroch (1992), (40a).

- (5) Wenn jemand nach Hause kommt und da steht der someone to house comes and there stands the Gerichtsvollzieher vor der Tür. ... bailiff before the door 'If someone comes home and the bailiff is standing there in front of the door, ...' $[tnh2 (6)]^6$
- (6) a [_{CP} [_{CP} wenn jemand ... kommt] und [_{CP} da steht ...]]
 b [_{CP} wenn [_α [_τ jemand ... kommt] und [_β da steht ...]]]

Some of these examples seem at first glance to call into question whether coordination in fact respects even bar-level.

2. Licensing of Adjuncts (modifiers)

In order to find a solution to these and other constructions, to be discussed below, we need to say a word about licensing. Since at least Stowell (1981) it has been clear that a desideratum for linguistic theory is the elimination of explicit phrase structure rules, since, as noted earlier by Chomsky, most of the information in phrase structure rules duplicates lexical subcategorization information. That complements are licensed as arguments of heads which assign Θ -roles is clear enough, but how, or if, the rest of the X-bar theory can be eliminated is still subject to discussion. "Predication", in some loose sense has sometimes been invoked for licensing of subjects and adjuncts. In the case of subjects, the subject Y^{max} is an argument of the *lexical* head of the Xⁿ predicate (e.g., the lexical V, not Infl). If the entity is a constituent, it is generally considered a further projection of Xⁿ, i.e. an Xⁿ⁺¹. In the case of adjuncts, on the other hand, the adjunct acts as an identity operator on the constituent of which it is predicated, hence if Xⁿ modifies Y^m in $[\alpha X^n Y^m]$, then α is also a Y^m , just as in the case of coordinate structures above, the difference being that the adjunct modifier is a maximal category acting as an identity operator as opposed to minimal (lexical) identity operators like conjunctions and negation.

Let us be more concrete about what it means for an adjunct to be "predicated" of a head. It has been suggested that external arguments in Specifier positions in fact literally bind an argument position in the projection of the lexical head either by movement (Koopman & Sportiche 1991) or by coindexation of an *in situ* empty element. For example,

- (7) a John_i has [e_i wrecked the car].
 - b John, is $[e_i \text{ in the kitchen }]$.

⁶ Examples referenced *tnh2* and *tnh* are taken from Höhle (1990) and (1983), respectively.

Following the suggestion in Kolb & Thiersch (1991) (henceforth K&T), let us assume that the same is true for adjuncts: the "external" O-role of a modifier is an empty category in its Specifier, analogously to (7e), coindexed with what it modifies:

[$_{DP_i}$ The_i man [Θ_i in the kitchen]] (8)

This gives us the proper interpretation: for the DP in (8), roughly 'the(x_i) \ni $(man(x_i) \land in(x_i, \forall the \ kitchen)))'$. Unlike the examples in (7), however, it cannot be generated by movement, but must be coindexed by some principle(s) of interpretation. One suggestion, not without its problems is that by default it is coindexed with the head of the constituent in which it is situated; see discussion in K&T. We note here in passing that such an interpretive account for the licensing of adjuncts suggests that this, rather than lack of government, is responsible for the well-known resistance to extraction and perhaps for their opacity as well. A tentative suggestion appears in K&T.

3 Asymmetrical coordination

Let us now turn to the sort of construction exemplified in (5). One's immediate reaction is that these ought not to be a problem, they are simply two conjoined CP's, the first "subordinate", i.e., verb last and the second "main", i.e., verbsecond⁸, as in (6a). Höhle however argues that the coodination begins with jemand, which implies that there must be a constituent α , as in (6b), whose feature composition is not at all clear. In traditional (GB) terms, depending on analysis, this would imply that one is conjoining an IP or VP, with a CP, hence the name "asymmetrical" coordination. And like the examples in (3), these would seem to present a problem for the analysis of coordination sketched above. Note that it is not in general possible to conjoin any two arbitrary clauses, one verb second and one verb final, as in (9) and similarly in (10).

(9)*Er meint, daß Frieda die Kartoffeln geschällt habe und thinks that F. He the potatoes peeled has and Karl sei schon hier. K. is already here

'He thinks that F. has peeled the potatoes and K. is already here.'

Where α is shorthand for "the interpetation of α ".

⁸ The terms main and subordinate are really misnomers as has often been noted in the literature. We assume the reader is familiar with German and Dutch clause structure.

(10) *Wann holst du die Fahrkarten und Heinz sein Zeug When get thou the tickets and Heinz his stuff einpackt? [tnh2 (25)] packs

Intuitively, what is wrong with (10) is that in the intended interpretation, wann should have scope over both clauses; but then they should both have main-clause word order, i.e. finite verb second as in

(11) [CP Wann [C' holst du die Fahrkarten] und [C' packt Heinz sein Zeug ein?]]

But, Höhle notes, this is precisely the interpretation of (5), namely that the scope of the *wenn* is interpreted to be over both clauses, hence one would also expect that both clauses be verb final. This is of course grammatical, but so is the mixed word order (5). More evidence for the bracketing in (6b) follows below.

4. Höhle gaps

Another construction which, it will turn out, is related to asymetrical coordination are unexplained gaps in subject position. An example is

(12) Gestern kamen ein paar Studenten und verteilten — yesterday came a few students and distributed gap Flugblätter.
pamphlets

'A few students came yesterday and distributed pamphlets'

Here, the first clause is a "main", i.e. verb-second clause, and one can see the second to be verb-second as well, since the finite verb precedes the direct object.9

But this means that the subject is missing from the second conjunct; unexpectedly, since German is not a pro-drop language. This implies, assuming for the moment the "traditional" analysis of Germanic V-2 constructions as CP's, that the structure must be either two CP's, the second of which has an empty Specifier or a conjunction of two C's which share the specifier containing gestern. Although the the latter might seem plausible in view of the intuitive shared interpretation of the adverb gestern, Höhle gives two arguments that the Vorfeld

These also occur in Dutch; see Van Zonneveld (1992) for some amusing examples from the literature, and Zwart (1992) for an alternative analysis. In certain Skandanavian languages they can also appear in object position, although it is not apparent that this is a related construction.

constituent cannot be related to a position in the second conjunct: Firstly, for many speakers the second conjunct can contain an adverb distinct from, and contradictory to, the first adverb:

- (13)Karl in Mainz los und kommt ---Am Abend fährt evening drives K. M. away and comes gap at-the in Morgen in Bonn an am morning in B. at-the on 'In the evening Karl leaves from Mains and arrives in the morning in Bonn.' [like tnh(76b)]
- (14) *Am Abend fährt Karl in Mainz los und kommt Heinz am Morgen in Bonn an. [like tnh(38b)]

As (14) shows, the second adverb is disallowed when there is a subject in the second clause, i.e., when the Vorfeld is really is shared. Secondly, there cannot be true extraction from the second conjunct, either singly as in (15) or doubly, respecting ATB, as in (16):

- (15)*Seine Bücher, wandte er, sich der Malerei zu his books [turned he himself the-DAT. painting to] und verkaufte e_i . and [sold $gap_i \ gap_i$ 'his books, he turned to paining and sold e_i ' [tnh2 (44)]
- *[Die Unterlagen], brachte ich, ins (16)Büro und zeigte the documents brought I into-the office and showed *e, /sie, Kollegen. den e_i gap, gap, /them the-DAT. colleagues 'The documents, I brought into the office and showed (them) to my colleagues.' [tnh(51a)]10

At first glance, it would seem that the presence of an empty Specifier (or the lack of one) in the second conjunct is crucial for the missing subject construction. While a complete discussion of these constructions is beyond the scope of this article, we note here that one solution which immediately comes to mind is probably not correct: namely that the second clause is a CP with an empty operator in the Vorfeld position binding the empty subject along the lines suggested in Huang (1984), as in (17).¹¹

Note speakers' judgements differ on some of these; see discussion in Thiersch (in prep.) and Zwart (1992).

¹¹ I.e., an argument position can be empty in the Mittelfeld iff the Vorfeld is empty, presumably being filled by the empty operator. Thiersch (1988) adopted this.

[CP] Gestern kamen [ein paar Studenten],] und [CP] OP, verteilten e_i Flugblätter].

For example, object gaps of the same kind in the Mittelfeld are completely impossible, even though German allows fairly free scrambling, resulting in the accusative object being the "topmost" element in the Mittelfeld.

- Menge wütender Kunden (18)Gestern hat den Fritz eine the-ACC. F. a-NOM. group furious vesterday has erwischt und (dann) haben ihn ihre Anwälte angezeigt. him their lawyers charged and (then) have 'Yesterday a group of furious customers caugt Fred and their lawyers had him indicted.'
- (19) **Gestern hat [den Fritz]_i eine Menge wütender Kunden erwischt und haben e_{ifdirobi.} ihre Anwälte angezeigt.

Such an anlysis is hard put to explain why similar object gaps fail to occur, since they are the most natural instances of the empty operator construction in German.

5. Characteristics of asymmetrical constructions

We need to note here that subject gaps also occur in asymmetrical coordinations:

(20) wenn jemand nach Hause kommt und sieht (da) den if someone to house comes and sees (there) the Gerichtsvollzieher, bailiff 'if someone comes home and sees the bailiff (there) ...' [tnh2 (8)]

Here again, the question rises as to what the correct constituent structure is. If the analysis in (17) were right, then the second constituent in (20) could also be construed as a CP with an empty operator binding the subject position:

(21) $\left[_{CP} \left[_{CP} \text{wenn jemand}_{i} \dots \right] \right] \text{ und } \left[_{CP} OP_{i} \text{ sieht } e_{i} \right]$

Here again, however, the *wenn* has scope over both conjuncts, and Höhle assumes a structure like that of the asymmentrical cases with both conjuncts are contained inside the *wenn*, just as in (6b):

(22) wenn jemand [$_{\alpha}$ [$_{\tau}$ nach Hause kommt] und [$_{\beta}$ sieht da ...]] [tnh2 (17)]

That is, the second conjunct is conjoined with a projection of the first verb which does not contain the subject. Höhle shows that, surprisingly, the conjunction itself can be conjoined:

(23)in die Wiiste zieht lebt dort von Wenn iemand und someone in the desert draws and lives there from If Heuschrecken oder sich im Wald verirrt hat und in-the woods errored and grasshoppers self has α r nährt Wurzeln und Beeren, ... sich von nourisches self from roots and berries ... 'if one retreats to the desert and lives there fromgrasshoppers or gets lost in the woods and lives off of roots and berries' [tnh2 (32a)]

What is remarkable here is not only the bracketing but that if the two conjuncts are categorially "different" (and this would be implied by most standard analyses of Germanic head-movement, as one is verb-last and one is verb-second¹²), but that the conjunction of an α and a β is evidently itself an α . Furthermore, as noted above, we can extract from the first conjunct but not from the second ((15) repeated here for comparison):

- (24) Seine Bücher, verkaufte er e_i und wandte sich der Malerei zu. [tnh2 (43)]
- (15) *Seine Bücher, wandte er sich der Malerei zu und verkaufte e_i .

Hence Höhle remarks that the first conjunct acts as "head" of the construction. Finally recall, (12), that verb-final is not allowed in the second of asymmetrical coordinations: for example, verb-first can be used with the conditional meaning, just as in English:

- (25) kommst du nach Hause und da steht der G. ... come thou to house and there stands the b. ... 'were you to come home, and there stood the bailiff ...' [tnh2 (18)]
- (26) *kommst du nach Hause und da der G. vor der Tür steht, [tnh2 (20)]

Höhle (1990) suggests that many of the properties of these constructions can be derived from a set of assumptions based roughly on a suggestion in Kathol (1990). Fundamental to Höhle's analysis is the phrase structure which he takes to underly the three main clause types [tnh2 (23,12)]:

Although see Heycock & Kroch (1992), Hoekstra (1993) for alternative analyses.

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(27) a E-clauses: [_{Cmax} \ CMP \ [_{1}^{1} \ I^{0} \ [_{vmax} \ X \ VK \ ]]]
b F2-clauses: [_{1}^{2} \ K \ [_{1}^{1} \ I^{0} \ [_{vmax} \ X \ VK \ ]]]
c F1-clauses: [_{Cmax} \ C^{0} \ [_{1}^{1} \ I^{0} \ [_{vmax} \ X \ VK \ ]]]
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where E = 'verb end', F2 = 'finite verb second' F1 = 'finite verb first', and VK is (the rest of) the verb-cluster.¹³ We can translate this into a more familiar structure such as that assumed, for example, by Zwart (1992) where C⁰ licenses an IP to its right, and I⁰ licenses a VP to its right. We note here that this entails that I⁰ assigns nominative Case to the right whether or not it is filled, and the subject is within V^{max}, unless it has been topicalized in an F-2, clause (which, *nota bene*, are IPs here). Note that under this analysis we have in the plain asymmentrical cases a conjunction of two saturated predicates, a V^{max} and an I² (i.e., also *max*) (29), while in the subject-gap construction, two predicates missing the external argument, a V¹ and a I¹ are conjoined (29)¹⁴:

- [28] $[_{C^2}$ wenn $[_{I^1}$ I^0 $[_{V^{max}}$ $[_{V^{max}}$ jemand nach Hause kommt] und $[_{I^2}$ da steht der Gerichtsvollzieher]]]]
- (29) $[_{C^{max}} \text{ wenn } [_{I^{max}} \text{ I}^0 \text{ } [_{V^{max}} \text{ jemand } [_{V^1} \text{ } [_{V^1} \text{ nach Hause kommt}] \text{ und } [_{I^1} \text{ sieht da den Gerichtsvollzieher}] \dots]], [=(24)]$

While the grammaticality judgements (with two exceptions, cf. Höhle's footnote 4) are derivable in this system, we are left with the unanswered question as to why the first conjunct behaves as the "head", i.e., why just this particular configuration.¹⁵

For a complete discussion of how many of the characteristics are derived, see Höhle's original article.

I am assuming (roughly following Höhle) that that what counts in coordinate structure is bar-level and "functional" features, e.g. saturation of predicates. While beyond the scope of this short article, it is clear that this can be expressed in terms of functional projections. That is, it is the functional projection — Det, Infl_{+fin}, C_{rel}, C_{ug} — which determines the syntactic distribution of lexical categories such as [N, V]. Note this means assuming an abstract projection over AP's ([+N,+V]) parallel to Det and Infl. In particular, this means that clauses behave in this respects exactly parallel to the "lexical" projections in (3):

i. They revealed [Fred's true identity] and [that he worked for the Mafia].

ii. a diplomat [with great charm] and [whom everybody trusted] ...

Heycock & Kroch (1992) suggest a solution along somewhat similar lines: basically, Comp is really an Infl under certain conditions, i.e., when it is predicated of a subject in a F2 clause:

^{&#}x27;Yesterday Margot, was sick and therefore e_i spent the whole day in bed.' [h&k 6] where the C' is to be interpreted as a quasi I', and we hence have a conjunction of likes. While this works for the subject gaps, it fails to explain the simple cases of asymmetry like (5) as well

6. Suggestion

What we would like to do here is bring these diverse observations and suggestions together in an analysis that explains this core characteristic observed by Höhle, namely that the first conjunct behaves as the "head" of the construction. In a recent article, Munn (1992) suggests analysing parasitic gaps as coordination parallel to parasitic gap constructions. He also takes (1) as the basic structure for coordination, and proposes that in certain cases, e.g. parasitic gaps, we have a structure like the following:

(30)
$$[H^n [H^n ... H^0 ...] [X^n OP_i [after/but [X^n ... X^0 ... e_i ...]]]$$

While discussing this proposal goes beyond the scope of this short article (see Thiersch *in prep.*), it should be noted that (30) has the problem of not being interpretable in any obvious way; i.e., the consituent X^n is simply adjoined to H^n , but meets no particular licensing condition. What comes to mind immediately is that it is an adjunct, but then it is neither a (Chomsky-)adjunct by movement, nor a modifier since the Specifier of the *after/but* is filled with the OP_i (also an odd landing site, since this position presumably gets a Θ -role — see above discussion in § 2). Leaving aside the parasitic gap case, let us turn to the asymmetrical coordinations and see if we can revise the structure in (30). Suppose the second conjunct is indeed an adjoined coordination similarly to (30), but that the "Specifier" of the conjunction (i.e. the V'_i in (1)) is here an empty category. The only plausible way to license the adjunction structure is as a modifier of the head-projection, coindexing the empty category with the head (projection) as in (8). Hence we have

(31) a Symmetrical coordinates as in (1) above; b Asymmetrical: $\begin{bmatrix} H^n & H^n & \dots & H^0 \\ H^n & \dots & \dots \end{bmatrix} \begin{bmatrix} Y^n & e_i \\ Y^n & e_i \end{bmatrix}$ [und $\begin{bmatrix} X^n & \dots & X^0 \\ X^n & \dots & \dots \end{bmatrix}$]

and the structure for (28) would be

(28') [$_{C^2}$ wenn [$_{I^1}$ I 0 [$_{V_i}^{max}$ jemand nach Hause kommt] [$_{\alpha}$ e_i [und [$_{I^2}$ da steht der Gerichtsvollzieher]]]]]]

On the righthand side of the adjunct is the right conjunct, but on the lefthand side is an empty category, which by the assumed theory of interpretation of adjuncts,

as the asymmetry of extraction. For a discussion of this and other proposals, see Thiersch (in prep.).

As opposed to Huybregts & Van Riemsdijk (1985) who analyse parasitic gaps as ATB coordination, and various other suggestions in the literature.

is coindexed to the head of the constituent which appears superficially to be the left conjunct. This gives us precisely the interpretation needed: the second conjunct is in the scope of the conditional, and modifies the first clause by adding a condition (the meaning of *and* implies 'addition'). The 'categorial' features of α in (28') are the 'functional' features of the I² and e_i (= V^{max}), both saturated predicates. (Cf. footnote 14.)

Note that the resulting structure (28') now has the desired properties. The first conjunct, not the second, is in fact the head of the projection. From this it follows that we can extract from the first, but not the second conjunct, since it is an adjunct and forms a barrier for extraction in the usual way. Hence in main clauses with subject gaps, such as (24), we can extract both the finite verb from the first IP and, optionally, another argument. Furthermore, the verb of the second conjunct, being in an adjunct, is not governed by the lexical Comp (wenn, for example) and hence must move, as though it were in isolation. This gives us the desired result¹⁷:

[32] [seine Bücher]_i [11 verkaufte_j [
$$v^{max}$$
 er_k [v^{1} [v^{1} e_i e_j] und [11 wandte_n [v^{max} e_k sich der Malerei zu e_n]]]]]]

Finally, we note that under these assumptions, we can see why object gaps as in (19) are impossible. The shared element would be the DP *den Fritz*, and both imaginable structures are excluded:

(33) a ...
$$[V_{\text{max}} DP_{\text{acc.}}] [V_{\text{max}} V_{\text{k}}^{\text{max}} DP_{1 \text{ nom.}} ... e_{\text{acc.}} ...] [e_k \text{ und } [I^1 V_{\text{fin}} V_{\text{k}}^{\text{max}} DP_{2 \text{ nom.}} ... e_{\text{acc.}} ...]]]]]$$
b ... $[V_{\text{max}} DP_{\text{acc.}}] [V_{\text{max}} DP_{1 \text{ nom.}}] [V_{\text{k}}^1 V_{\text{k}}^1 ... e_{\text{acc.}} ...] [e_k \text{ und } [I^1 V_{\text{fin}} V_{\text{k}}^1 DP_{2 \text{ nom.}} ... e_{\text{acc.}} ...]]]]]]$

In the first there is a complete mismatch of bar-level in the adjunct coordination (V^{max} with I¹), and in the second, the empty category representing the coordinate missing the subject is coordinated with a finite projection which already has a subject and there is a mismatch in saturation of the predicates. Furthermore, the accusative DP has been moved to its clause initial position by ATB "scrambling", arguably an A-bar movement; but we have seen that extraction from the second asymmetrical conjunct, being an adjunct, is impossible.

For the purposes of this article, I leave the notation I² for main clauses; there is a long history of controversy over whether main clauses in German/Dutch are IP's or CP's. As the remarks in footnote 16 indicate, the author believes this to be a red herring; see discussion in Thiersch (in prep.).

7. Conclusion

Summarizing, we have been able to derive the properties of the construction from the following assumptions (a) that normal coordination works as in (1) with the remark that the features which must unify are those of bar-level and functional projection (argument/predicate status); (b) that adjunct modifiers are licenced by coindexing an empty category in the Specifier of their dominating functional projection: and (c) that a coordinate structure may exceptionally be an adjunct if it fulfills the licensing conditions in (b).

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