

Asymmetrische Koordination? Jain!

Another look at subject and object gaps in coordinate structures*

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1. Introduction and Background

In a very interesting analysis of coordinate structures with subject and object gaps titled “Asymmetrische Koordination,” Buring & Hartmann (1998) argue for an asymmetric analysis of the *Subjektluckenkonstruktion* (SLK), subject gap construction, a renaming of the SLF-construction in Höhle 1983), a coordinate construction with a subject gap in the second (and all subsequent) conjunct(s), as illustrated in (1)(their (6b):

- (1) Der Italiener, schätzt Rotwein und [hasst e_i die Franzosen]
The Italian treasures red-wine and hates the French

Buring & Hartmann (B & H) point out a number of subordination effects that can be observed in the second clause of the SLK (hereafter SGC for “subject gap construction”), for which reason they argue that the second conjunct is adjoined to the first and is always a CP in whose Spec,CP position an empty Operator occurs which binds and identifies the empty subject in Spec,TP, as illustrated in (2) (their (10):

- (2) [_{CP}* in Italien [_C [_C* schätzt] man, Rotwein [und [_{CP} OP, hasst [_{TP} e_i die Franzosen]]]]
in Italy treasures one red-wine and hates the French

The asterisk indicates the categories belonging to the first conjunct. The second conjunct, B & H argue, stands within the scope of virtually every element in the first conjunct; hence the subordination effects.

B & H give a better account of the properties of the SGC than any study preceding it. However, they make certain assumptions about German syntax and the syntax of coordination which I will show to be questionable. Most importantly, the alternate proposal I will make results in a syntax of coordination that accounts for certain symmetries in the SGC and the Object Gap Construction (OGC) which aren't apparent in B & H's analysis. SGCs and OGCs from English, lacking in B & H's analysis, will be analyzed in comparison with German to establish an empirical basis for key assumptions. A central assumption will be that the asymmetries evident in these constructions actually have a parallel symmetry which is crucial for the derivation and interpretation of them. More particularly, I assume that subject-initial verb-second clauses in German are TPs (cf. Zwart 1997, te Velde 1992). With this assumption it is possible to account for the SGC in terms very familiar to the syntax and semantics of coordination: 1) that coordinate structures have syntactic and semantic symmetries, despite the asymmetric phrase structure, and 2) the SGC and the related object gap construction (OGC) are just two more examples of left-peripheral deletion (cf. Wilder 1997 for discussion). Left peripheral deletion will be analyzed here as a surface-level result of the non-spell-out of a lexical item.

This article is organized as follows: In §2 we look more closely at the SGC, English equivalents to it, and reasons why it should be considered a case of symmetric coordination with an asymmetric phrase-structural frame. A basic principle of coordination, Coordinate Feature Matching, is introduced. In §3 we consider feature matching in the SGC and in a related construction, the OGC, noting how it differs from the SGC. In §4 we consider first the limitations of other approaches to the two construction types and then an approach using Coordinate Feature Matching. In §5 the derivational steps required for each type are outlined for the purpose of pinpointing the source of the different properties. This leads to the conclusion in §6.

* This research was supported by a grant from the Fulbright-Kommission, Bonn and by the *Zentrum für Allgemeine Sprachwissenschaft* which hosted me during my stay in Berlin, January through June, 1999. My sincere thanks go out to these organizations, and also to individuals at ZAS who discussed my ideas with me, especially Ewald Lang, Kerstin Schwabe, Chris Wilder, Alan Munn and Niina Zhang.

2. The SGC: coordinate symmetry within an asymmetric phrase structure

In this section I will analyze the structure of constructions like (1) as in (2):

- (2) Der Italiener, schätzt Rotwein und [*e*, hasst die Franzosen]
The Italian treasures red-wine and hates the French

I will argue that the German SGC is syntactically very similar to the following SGC found in English:

- (3) The typical Italian, loves red wine and *e*, has always hated the French

Both constructions, I will show, are the coordination of TPs; for independent reasons we can assume that the TP in both languages -- not just in English -- can be a fully-saturated clause.

Assuming that the TP is a full clause in German (paralleling extensive work on Dutch in Zwart 1993, 1997) has broad implications for the syntax of simplex clauses in these languages, as well as for the syntax of coordinate clauses. The idea that German subject-initial clauses are different than other clauses, all of which I will assume are CPs, has its origins in Travis 1984. For coordination this assumption most importantly makes possible an analysis of the SGC as a non-exception in coordination: though it has an asymmetric phrase structure, it is not fundamentally asymmetric for all the reasons argued in B & H. The empty subject in the second clause is not within the scope of the first conjunct anymore than fully lexical subjects. The non-spelled-out subject in the SGC has all the syntactic and semantic properties of a "normal" subject.¹

2.1 The Structure of the SGC

2.1.1 Where the subject gap is located

There have been various accounts of the German SGC (Höhle 1983, Heycock and Kroch 1993, Thiersch 1994). The account I give here will build to a certain extent on these, but it will differ from them in several key points, primarily with respect to the derivational steps each construction requires. In my analysis both the derivational and the representational aspects of syntax theory come into play.

We consider first the SGC in (4):

- (4) a. In Italien schätzt man Rotwein und hasst die Franzosen
In Italy treasures one.nom red-wine and hates the French
b. In Italien schätzen die Politiker französischen Rotwein und die Bauern hassen ihn
In Italy treasure the politicians French red-wine and the farmers hate it
"In Italy the politicians treasure French red wine and the farmers hate it."

I will assume that both (4a) and (4b) have essentially the same structure:

- (5) a. [_{CP} In Italien schätzt [_{TP} man, Rotwein und [_{TP} *e*, haßt die Franzosen]]]
b. [_{CP} In Italien schätzen [_{TP} die Politiker fr. Rotwein und [_{TP} die Bauern hassen ihn]]]

Neither of these constructions is more marked than the other; both are clearly unmarked. By contrast, the construction in (6a) is at least somewhat marked, whereas (6b) is not:

- (6) a. In Italien schätzen die Politiker französ. Rotwein und hassen die Bauern die französ. Winzer
In Italy treasure the politicians French red-wine and hate the farmers.nom the French vintners
b. In Italien schätzen die Politiker französ. Rotwein und die Bauern hassen die französ. Winzer

¹ Non-spell-out and the consequent non-phonological realization in PF follow from a general economy principle in coordinate structures which avoids Spell-Out where syntactically and semantically possible.

I will take (6) as one piece of evidence that the empty subject position in the SGC is before the finite verb in the second conjunct, following the most unmarked case in non-elliptical equivalent constructions. For other evidence, see te Velde 1992. This assumption allows us to simplify the analysis of the SGC and the OGC as closely-related constructions. In both it is very clearly not possible to have an element besides the gap preceding the verb in the second conjunct:

- (7) a. In Italien schätzen die Bauern, den Rotwein und e, hassen mit Leidenschaft die Franzosen.
 a' *In Italien schätzen die Bauern, den Rotwein und mit Leidenschaft e, hassen die Franzosen.
 In Italy treasure the farmers the.acc red-wine and with passion hate the French
 b. Den Rotwein, schätzen die Bauern und e, trinken die Politiker jeden Abend.
 b' *Den Rotwein, schätzen die Bauern und jeden Abend e, trinken die Politiker.
 The.acc red-wine treasure the farmers and every evening drink the.nom politicians

If one argues that the subject gaps in (7) actually occur after the finite verb, as do B & H, then there is no clear syntactic explanation for the ungrammaticality of constructions with an element preceding the finite verb. If on the other hand we assume the analysis in (2), then the syntactic explanation is clear: because of the verb-second (V2) constraint in German, the pre-verb position may not be occupied by a lexical item in addition to the gap, indicating that the gap does indeed have syntactic reality. We will see in §3 that this assumption has benefits for a theory of ellipsis in coordination.

2.1.2 Evidence for the subject gap

This analysis not only provides a unified account of the SGC and the OGC which can also account for the differences between the two, it also provides an explanation for a related fact about the SGC: that it is possible for the gap to have different reference than its antecedent. Independent evidence of this fact is supported by (8) (from B & H 1998: 187), which is also evidence that the gap actually exists:²

- (8) Eine Frau ist in Amerika Außenministerin und bekleidet in Deutschland sogar das zweithöchste Amt des Staates.
 A woman is in A. foreign-minister and holds in Germany even the second-highest office of-the state.
 "In America a woman is secretary of state and in Germany (a woman) even holds the second-highest office in the land."

It is possible to get two readings of this sentence (the second of which doesn't correspond to reality):³

- (9) a. In Amerika ist eine Frau Außenministerin und in Deutschland bekleidet eine Frau sogar...
 In A. is a woman foreign-minister and in G. holds a woman even ...
 "In America a woman is secretary of state and in Germany a woman even holds..."
 b. Es gibt eine Frau, die in Amerika Außenminister ist und in Deutschland sogar ... bekleidet
 It gives a woman, who in A. foreign-minister is and in G. even ... holds
 "There is a woman who in A. is secretary of state and in G. even holds ..."

In other words, it is not possible for the one subject in the first conjunct to simply be shared by the two verbs. Rather, the minimal assumption is that two Spec,TP positions must be available. I will assume that this is true in every SGC; arguing that one SGC has a shared Spec,TP element but another one like (8) optionally doesn't leads to unnecessary complexity in the grammar. It would mean that the derivation of the SGC is construction-specific in the sense that it would be dependent on the interpretation given: those with interpretation A would be generated with just one Spec for all coordinate TPs, whereas interpretation

² English constructions like *In Italy people love red wine and hate the French* is not an SGC but "only" the coordination of two VPs. In this construction nothing prevents the two verbs from sharing one Spec,TP position. There are "true" SGC constructions in English, however; cf. §4.1 where we will see that the same ambiguity as in (8) is possible.

³ Note also that this fact rules out the possibility that in German there is across-the-board movement in SGCs.

B would induce the expected one-Spec-for-every-TP structure. The fact is, all SGCs are identical structurally and syntactically; hence we would not expect some TPs to project a Spec position in the second conjunct, while others do not.⁴

The question of how the subject gap in (8) is recovered must be addressed: How does recovery proceed if coindexation -- which presumably would force the two elements, the lexical subject and the coindexed gap, to have the same reference -- is not possible? There is a way around this problem which allows coindexation and the distinct reference. If we assume that the antecedent *eine Frau* has the feature [+existential] (along with [+indefinite], meaning that the DP is not a specific individual but any woman x , then the coindexed gap, because it occurs in a distinct Spec, TP position, does not have to have identical reference. This feature is not sufficient for the desired interpretation if no gap occurs in the second conjunct. My assumption is that *each Spec,TP position has its own reference* when [+existential] occurs on an indefinite.⁵

2.2 The SGC and adverbial scope

It is clear that in (10) the element *in Italien* has scope over the whole coordinate structure. This long scope is of course not automatic, as Buring & Hartmann also point out:

- (10) Morgen fährt Peter nach Italien ab und kommt übermorgen an.
 Tomorrow drives P. to Italy off and comes over-tomorrow at
 "Tomorrow P. is driving to Italy and arriving the day after tomorrow."

It is possible to "enhance" the scope of adverbs through topicalization, as in

- (11) In Italien schätzen die Politiker französ. Rotwein und hassen die Bauern französ. Winzer
 In Italy treasure the politicians French red-wine and hate the farmers French vintners
 "In Italy the politicians treasure French red wine and the farmers hate French vintners."

but scope is not dependent on structural position, nor by the occurrence of a subject gap, as indicated by the fact that in all constructions in (12) the scope of *in Italien* is the same:

- (12) a. In Italien schätzt man Rotwein und hasst die Franzosen
 a' Man schätzt Rotwein in Italien und hasst die Franzosen
 One treasures red-wine in Italy and hates the French
 b. In Italien schätzen die Politiker Rotwein und die Bauern hassen französischen Winzer
 b' Die Politiker schätzen Rotwein in Italien und die Bauern hassen französischen Winzer
 The politicians treasure red-wine in Italy and the farmers hate French vintners

This fact suggests that asymmetric structure alone and how it has been formalized in Antisymmetry Theory in terms of the LCA is not precise enough to define adverbial scope in coordinate structures. In §2.3.3 we will see that in coordinate structures matching is required to make adverbial scope precise.

2.3 Coordinate Feature Matching

2.3.1 Features in Coordination

It can be independently shown that coordinate structures require the matching of features for their derivation and interpretation. Coordinate Feature Matching (CFM) will be used here to refer to the

⁴ In Minimalist theory not every TP must have a Spec position. My assumption here is that the needs of the TP in the first conjunct do not get "carried over" to the second conjunct; rather, the TP in the second conjunct is generated independently with a Spec because it also must have a subject. This subject is then marked for non-spell-out once Coordinate Feature Matching has occurred (cf. §2.3).

⁵ Note that the same kind of independent referencing of each Spec,TP element occurs in
 (i) A woman_x has served as governor but e_y has never been elected president

matching of a feature bundle in one conjunct with a symmetric equivalent in another conjunct.⁶ Evidence of such matching is apparent in (13):

- (13) [_{C1} Peter likes visiting relatives] and [_{C2} Katie does too]
 [+hum.][+V^{fin}] [+V^{part}] [+hum.] [+hum.] [+aux.] = *likes visiting relatives*, C1
 [+male][+sg.] [+prog.] [+pl.] [+fem.]
 [+sing.][+trans.] [+trans.] [+obj.] [+sing.] etc.

The crucial case of matching in (13) centers around the phrase “visiting relatives” which can mean either “Peter going to visit the relatives” or “Relatives coming to visit Peter”; the derivation/interpretation given in the first conjunct must be carried over to the second conjunct (see discussion in Lang 1984: 52ff also). Feature matching is always much stricter in cases of coordinate ellipsis like the SGC, Gapping and RNR. In Gapping the elliptical verb must match syntactically and semantically with the antecedent verb: it must match in terms of tense, mood, voice, etc.; only number can differ:

- (14) Peter visits relatives and his parents e their friends (e = *visit*, not *visited* or *have visited*, etc.)

In RNR phonological identity appears to be a requirement (i.e. “complete” symmetry: Case, gender, number, θ -role, tense, reference, etc. all must be the same):

- (15) a. Peter entertains e_i and his brother interrogates [his relatives],
 b. *Peter entertains e_i and his sister interrogates [her relatives],
 (intended interpretation: each interrogates his/her own relatives)
 c. *Have you noticed that Peter always e_i but his parents seldom [visit relatives],

In (15b) the ungrammaticality is caused by the fact that *her* cannot have *Peter* as its antecedent; in (15c) *visit* cannot agree with *Peter*.

Coordinate Feature Matching is not restricted to constructions with Coordinate Ellipsis; it is clear that in (16a) and (16b) the subjects must share certain features in order for the interpretation to follow and for subject-verb agreement. If two conjoined subjects do not form a logical pair, they will not form a plural subject of a verb, which therefore cannot occur in its plural form:

- (16) a. #Peter and his guitar visit relatives on weekends (# = semantically informed)
 b. Peter, his guitar in hand, visits relatives on weekends

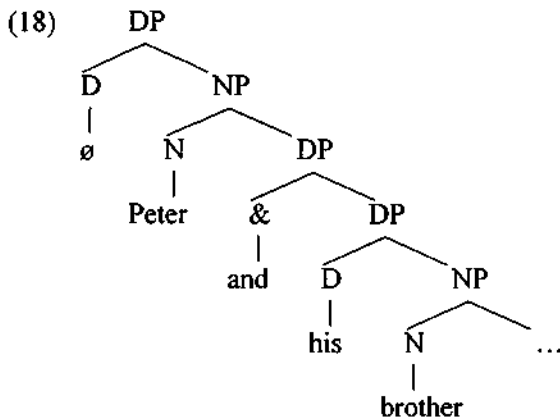
Degrees of symmetry and asymmetry can be defined in terms of degrees of matching:

- (17) a. Peter kennt [den Mann] und [seinen Bruder] (symmetric Case and θ -role)
 [+acc.] [+acc.]
 [+hum.] [+hum.]
 [+theme] [+theme] etc.
 b. [[Me] and [my brother] don't visit relatives together. (symmetric θ -role, asymmetric Case)
 [[+sg] & [+sg] +pl] [+pl]
 [+acc] [+nom]
 [+hum] [+hum]
 [+agent] [+agent] etc.

Even though the Cases assigned in (17c) don't match, it is grammatical (in non-prescriptive usage) because other forms of symmetry exist between the conjoined DPs *me* and *my brother*.

All of these coordinate structures have basically the same syntactic structure, using the assumptions of Antisymmetry Theory with regard to phrase structure.⁷

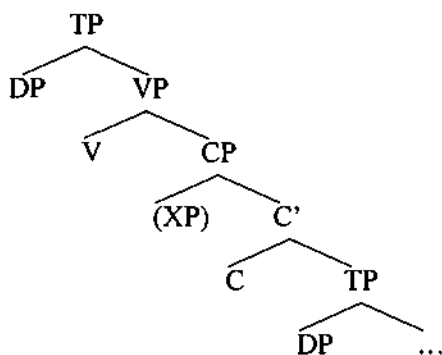
⁶ CFM should not be equated with feature matching in the general sense which has the purpose of eliminating those features which are uninterpretable before the derivation enters LF. See also note 9.



2.3.2 A note on the syntactic distinction between coordination and subordination

The structure in (19) is, we note, very similar to what is found in constructions with subordinate clauses:

(19) The structure of subordination: matrix clause (TP) + embedded clause (CP)



We note that in an embedded clause the subordinating conjunction projects its own phrase, while in the coordinate structure the coordinating conjunction does not project. The differences between them result from the different properties of the heads: a subordinating conjunction projects its own syntactic domain, while a coordinating conjunction does not project (like a clitic, cf. Japanese) and therefore does not have its own syntactic domain. Further support for this assumption comes from the fact that a conjunct can have any category status and stands in no syntactically or semantically subordinate relation to another syntactic category (versus a subordinate clause, which is always a CP; for further discussion see te Velde 1999).

2.3.3 Coordinate symmetry and adverbial scope

An exhaustive account of how adverbial scope interacts with the SGC would require more space than this article allows and would take the focus away from the main issue: the derivation and representation of the

⁷ With the current assumptions about Merge (Chomsky 1998) the structure in (18) cannot be generated, as there is no way to merge the DP dominating [&] with the lower DP. This problem can be overcome if we assume, based on what can be shown about coordinating conjunctions versus subordinating conjunctions and prepositions, that [&] has no properties for projection; therefore the category dominating it must be the projection of the sister, in this case DP.

SGC and the OGC. Therefore, I will make just a few observations in this section and leave a complete analysis to further research.

We observed in (12), repeated below, that the location of an adverb in the phrase structure of an SGC does not play a role in determining its scope:

- (12) a. In Italien schätzt man Rotwein und hasst die Franzosen
 a' Man schätzt Rotwein in Italien und hasst die Franzosen
 One treasures red-wine in Italy and hates the French
- b. In Italien schätzen die Politiker Rotwein und die Bauern hassen französischen Winzer
 b' Die Politiker schätzen Rotwein in Italien und die Bauern hassen französischen Winzer
 The politicians treasure red-wine in Italy and the farmers hate French vintners

The scope of the adverb can be blocked with the introduction of an equivalent adverb in the second conjunct:

- (20) a. In Italien schätzt man alle Rotweine und in Frankreich hasst man die italienischen
 In Italy treasures one all red-wines and in France hates one the Italian (ones)
- b. In Italien schätzt man alle Rotweine und *(man) hasst in Frankreich die italienischen
 In Italy treasures one all red-wines and (one) hates in France the Italian (ones)

We note two facts about (20): 1) The SGC is not possible with the introduction of an equivalent adverbial in the second conjunct,⁸ and 2) the adverbial introduced in the second conjunct does not have to be in a position symmetric to the position of the equivalent adverbial in the first conjunct. The second fact marks a distinct difference between adverbials on the one hand, and subjects in the SGC and objects in the OGC on the other. As will be pointed out in greater detail in §3, the antecedent of a subject or object gap must occur in the same position as the gap itself, a requirement of coordinate symmetry. This strict requirement, one could assume, is due to the fact that the SGC and the OGC involve ellipsis, which as we have already seen must meet much stricter symmetry requirements. It is impossible that there is an ellipsis, that is, a gap of the antecedent adverbial, in a construction like

- (21) In Italien schätzt man, Rotwein und e, hasst die Franzosen
 In Italy treasures one red-wine and hates the French

for as we have already seen, a subject gap occurs in preverbal position; any additional gap (or lexical element) is ruled out in German.

The fact that no gap is needed for the scope of *in Italien* to extend to the second conjunct comes as no surprise. It is a scopal element, and given the asymmetric phrase structure, nothing other than another symmetric scopal element can cut short its scope. These facts follow from the core assumptions being made here: 1) that the phrase structure of coordination is asymmetric; 2) that symmetries exist within coordinate structures despite the asymmetric phrase structure; 3) that these symmetries are more than just semantic. Although one could explain the scope of adverbs in semantic terms, it seems reasonable to assume that the properties of the phrase structure on the one hand create, or at the very least, allow the long scope, and in coordinate structures like (21) provide the structure in which Coordinate Feature Matching can proceed. That is the focus of the next section.

⁸ This fact is also found in the English equivalent:

(i) *In Italy people treasure all red wines and in France hate the Italians

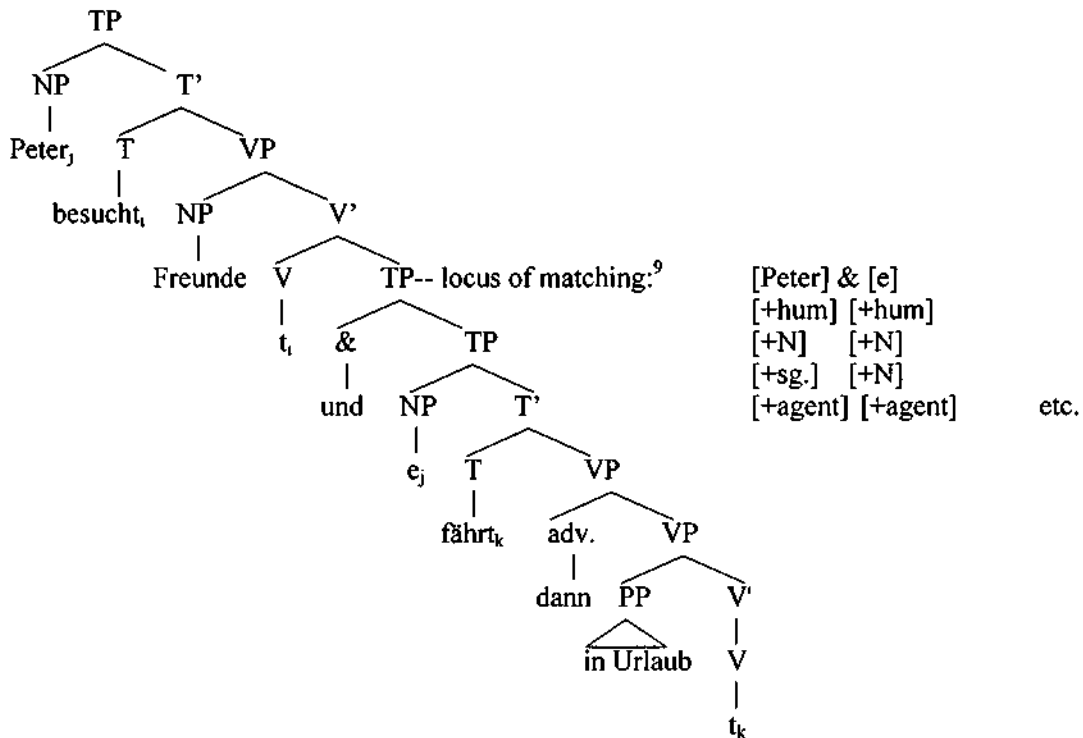
An account of this fact would take us too far afield, but one speculative observation is appropriate: the introduction of a new scopal element like *in France* has the effect of weakening the matching (symmetry) relation between the two conjuncts, in particular between the antecedent *people* and the gap coindexed with it. It follows from the general principle that the closer the match in coordinate structures, the easier an element like a subject can be elided.

3. Coordinate Feature Matching in the SGC and the OGC

3.1 The SGC

Given the assumptions about coordination and phrase structure laid out in the previous section, the SGC will have the phrase structure shown in (22) with Coordinate Feature Matching (CFM) at the TP which dominates [&]:

- (22) Peter besucht Freunde und fährt dann in Urlaub
 P. visits friends and drives (goes) then in (on) vacation



CFM in (22) exhibits a certain isometry: both the antecedent subject and the gap occur at the left periphery of their respective conjuncts. This form of symmetry in and of itself is not theoretically significant, however. The syntactic structure which creates it will be the basis for an account of the SGC and the OGC for reasons that will be explored in more detail in §4.4. Perfect isometry is not a requirement for matching as indicated by (23):

- (23) [_{CP} Im Juni besucht [_{TP} Peter, Freunde und [_{TP} e, fährt dann in Urlaub]]]

In (23) *Peter* is not isometric with the gap in terms of simple left-peripherality, and the finite verbs in each clause are in different positions; however, symmetry still exists in the fact that both *Peter* and the gap are at the left edge of their respective TPs. The fact that the antecedent must be in Spec,TP is supported by constructions like (24):

- (24) *Peter ist beim Vortrag ein Fehler_i unterlaufen und e_i wurde nicht entdeckt.
 P.dat is by-the lecture a mistake underrun and became not discovered
 "Peter made a mistake during the lecture and it wasn't discovered."

⁹ My assumption here is that in CFM the elimination of uninterpretable features does not occur as it does in the matching of features for the purpose of convergence. The sole purpose of CFM is to determine whether sufficient symmetries exist for a coordinate structure, and further, whether any items can be marked for non-spell-out (cf. §4.4).

Because the subject of *unterlaufen, ein Fehler*, is located in the VP, it cannot be the antecedent of the gap. Even though the string *Peter wurde nicht entdeckt* is grammatical, *Peter* is also not an appropriate antecedent for two reasons: 1) it occupies the Spec,CP position, and 2) it is assigned dative Case.

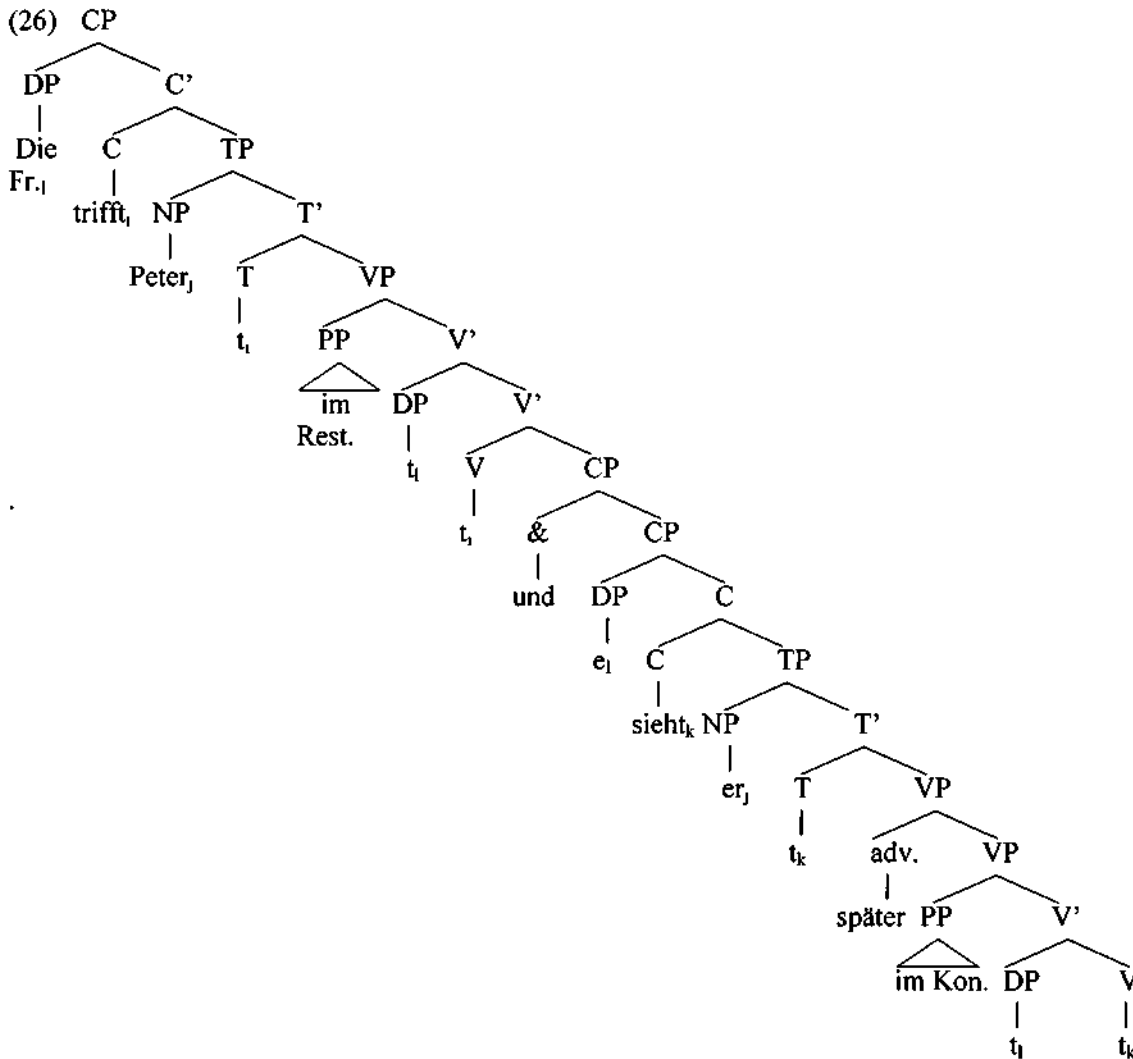
In the next section we look at feature matching in the OGC.

3.2 The OGC

In (25) is given a typical OGC:

- (25) Die Freunde trifft Peter im Restaurant und sieht er später im Konzert
 The.acc friends meets P. in-the restaurant and sees he later in-the concert
 "His friends Peter is meeting in the restaurant and seeing later at the concert."

The phrase structure I will assume for (25) is given in (26):



Again, the phrase structure itself is strictly asymmetric; however, syntactic and semantic symmetry nevertheless play a crucial role in the derivation and interpretation. This is evident in the fact that if the antecedent object is not fronted to Spec,CP, ungrammaticality results:

- (27) *Peter trifft die Freunde_i im Restaurant und e_i sieht er später im Konzert
 P. meets the friends in-the restaurant and sees he later in-the concert
 "Peter is meeting his friends in the restaurant and seeing (them) later at the concert."

It is also evident in the fact that the gap must be at the left periphery of its conjunct:

(28) *Die Freunde, trifft Peter im Restaurant und er sieht e, später im Konzert

In other words, topicalization of *die Freunde* must occur before this element can be marked for non-spell-out, the step necessary for creating the OGC in (28).

3.3 Symmetries in the SGC and the OGC

The SGC and the OGC therefore both require the follow forms of symmetry:

- (29) Symmetries required in the SGC and the OGC:
- A. The antecedent of the gap must be at the left periphery (i.e. in the Spec position) of the projection which defines the domain of the coordinate structure. The domain of the SGC is TP, of the OGC, CP. This position is symmetric with the position of the gap: In the SGC the gap must be located in Spec,TP, in the OGC in Spec,CP.
 - B. An array of other symmetries can be identified: the antecedent and the gap must both bear the same Case, θ -role, number, gender, etc. features. However, the distinct syntactic positions of the antecedent and gap allow each to have separate reference, if the antecedent bears the proper features, such [+existential] and [+indefinite].

The theoretically consequential aspect of the symmetry described in (A) is not the peripherality but the categories and the Spec positions of the projections TP and CP. The approach that I am laying out does not utilize parallel planes or 3D structures but rather aims to unify the syntax of coordination with the syntax as a whole. Given that the categories [C], [T], [N], [V], [P] and [A] do not each project structures with unique properties (all the phrases are structurally identical), no phrase structural properties themselves reflect any coordinate symmetry, only the categories and the respective Spec positions. Using a structural representation that is symmetric in some sense (e.g. Goodall 1987, Moltmann 1992) is not necessary in my proposal because of the matching property of coordination, formalized in the CFM. I assume features match in coordination, and that they match at a certain node and at a certain point in the derivation -- presumably before Spell-Out, certainly before PF. CFM, I assume, involves both syntactic and semantic features, which implies that coordinate symmetry is not purely a semantic property, the required assumption in approaches to coordination found in Munn 1987, 1993 and Kayne 1994.

In fact, purely structural properties and parameters play a role in the determination of what can be elided in coordinate structures. Evidence of this comes from the fact that in English both the subject and the object gaps can occur in one construction, a collapsing of the SGC and the OGC into one construction, whereas in German, because of its V2 parameter, this is not allowed:¹⁰

- (30) a. [This email]_i, I_j sent to the committee and e_i, e_j then saved on a diskette.
 b. *[Diese Email]_i, schickte ich_j an das Komitee und e_i, e_j/ich speicherte auf eine Diskette

If coordinate ellipsis -- which was shown to require the matching of conjuncts -- were only a semantic phenomenon, constrained only by universal principles of semantics, there would not be the difference evident in (30) between German and English.

Because of the "peripherality requirement" on the SGC and the OGC (also a structural form of symmetry, to be formalized in §4.4), it is not grammatical to have a subject gap in a post-finite-verb position:

- (31) [Diese Email]_i, schickte ich_j an das Komitee und e_i, speicherte *e_j/ich auf eine Diskette.

¹⁰ (30a) actually has quite a different structure than either the SGC or the OGC; it is two VPs conjoined, rather than two TPs. In (30b) the V2 parameter in German, requiring V-->T raising, prohibits this. The same prohibition does not apply to English constructions requiring V-->T, however, because the V2 parameter doesn't apply (i.e. both gaps can occur to the left of the verb):

(i) This email_i, I_j am now sending t_i to the committee and e_i, e_j will later save t_i on a diskette

A comparison of the SGC with the OGC reveals some interesting contrasts, one already mentioned:

- A. Both require the gap and the antecedent to be at the left periphery of the category conjoined in their respective conjuncts. However, for the SGC this category is TP, for the OGC it is CP.
- B. The SGC is unmarked, the OGC is highly marked.
- C. The SGC could be a universal (if the phrase structure assumed here is universal and all languages have at least some of their subjects in Spec,TP), while the OGC is limited to certain languages, as not all languages topicalize DPs and NPs like German and English.

4 Accounting for the properties of the SGC and the OGC

In this section we first briefly look at some limitations of common approaches to coordinate ellipsis with respect to the SGC and the OGC. In §4.3 an alternative to these accounts will be given which is able to overcome these limitations.

4.1 *Across the board (ATB) movement*

ATB movement cannot account for the non-identity option in the SGC found in (8) and also in English constructions like

(32) [A woman]_x has served as governor but e_y has never been elected president

unless we assume that in NP and DP movement no trace is created and that the gap which nevertheless remains can have a different reference than the antecedent. However, these caveats are questionable, given the differences between NP movement and ATB movement in constructions like

(33) [Which person]_i have we chosen t_i as governor, elected t_i president and then run t_i out of office

which are clear cases of ATB wh-movement. In (33) there is clearly only one person intended, and that is a general restriction on ATB movement, which like wh-movement is assumed to leave traces. Because traces are exact copies, the option is not available for a different reference, unlike the case in (32).

The ATB movement account is also unable to straightforwardly explain the markedness of the OGC: Why is it more marked than the SGC and wh-movement? Both should be unmarked if both are generated with the same operation. At the very least the OGC should be no more marked than a wh-construction. But this is clearly not the case.

4.2 *A structural symmetry account: phrase structure and semantics both symmetric*

A structural symmetry account (Goodall 1987, Moltmann 1992) is not able to account without stipulation for the asymmetric coordination of a verb-final clause with a V2 clause (an SGC):

(34) Jedesmal wenn Peter Verwandte besucht und fährt nachher in Urlaub, ...
Everytime when Peter relatives visits and goes afterward on vacation, ...

It is also not possible to account for the “One-More Construction” (Jackendoff 1997) in which a phrase that is clearly semantically subordinate is conjoined with a clause by means of *and*:

(35) [[One more beer] and I’m leaving]

The symmetry approach also has difficulty with constructions in which the scope of a negative like *never*, located in the first conjunct, extends over both conjuncts in constructions like:

(36) [C₁ Katie has never come home and [C₂ acted rude to her parents]]
 ≠ (a) Katie has never come home and (Katie) has never acted rude to her parents
 ≠ (b) Katie has never come home and (Katie) never acted rude to her parents.
 = (c) It has never been the case that Katie came home and acted rude to her parents

Because *never* occurs within the first conjunct, it does not -- at least in the surface configuration -- have scope over both conjuncts. There is no way to solve this problem without movement of *never* out to a position where it can have scope over the parallel planes or symmetrically arranged phrase structures (as in 3D representation). There is, however, no empirical basis for this kind of movement.

4.3 Symmetry in Asymmetric Phrase Structure via Coordinate Feature Matching (CFM)

The construction in (36) can be used to illustrate the advantages of the proposal being developed here which utilizes asymmetric phrase structure, upon which CFM operates creating a complementary semantic representation to capture the semantic symmetries. Before the semantic representation can be dealt with, we must first outline the syntax in (36). We consider first the question: Why is (c) the only possible paraphrase of (36)? The fact that only (c) paraphrases it tells us the following:

- A. The coordination cannot be such that *Katie has never* occurs in both conjuncts (in the second only abstractly, but with the same syntactic and semantic content) with *has* an auxiliary for both *come* and *acted*. This analysis is ruled out by (a) which is not equivalent to (36).
- B. The coordination cannot be such that *has* occurs only once and is shared by the two participles. This kind of sharing is possible in coordinate structures, as we see in (37):

- (37) Peter has bought a car and paid the tag, title and tax.
 =Peter has bought a car and Peter has paid the tag, title and tax.

If this kind of sharing were necessary for the interpretation of (36), then it should be equivalent to (b), but it is not. Even if we eliminate the negation, this kind of sharing is still not possible, as indicated in (38):

- (38) Katie has come home and acted rude to her parents.
 ≠Katie has come home, and Katie has acted rude to her parents.

In the analysis of (36), following what was outlined in §3 about the SGC and CFM we get:

- (39) [_{TP1} Katie; has never come home and [_{TP2} e_i [_T ∅][_{VP} acted rude to her parents]]]

(39) is the coordination of two TPs in which the second TP has a gap for *Katie*, but not for *has* and *never*; *has* forms no part of the interpretation of the second clause. Because an empty [T] is generated in the second conjunct, and because the second conjunct has TP status, *has* does not have any syntactic relation to *acted*. The absence of *has* in conjunct 2 actually creates an asymmetry: the tense in C1 is present perfect, in C2 it is preterite. An approach using symmetric phrase structure could not account for this type of asymmetry without stipulation.

We note on the other hand that symmetry is required for derivation and interpretation. The event described in C2 is predicated upon an isolated instance of the event in C1, which requires that both events be interpreted with the same tense, the preterite:¹¹

- (40) a. Katie came home $t_1, t_2 \dots t_n$ (where $t =$ some period of time) = Katie has come home
 b. Katie never came home t_x and was rude to her parents t_x .

What is required for interpreting the events in (36) is tense symmetry within a surface-level tense asymmetry. This process requires not simply a symmetric semantics of tense in parallel with asymmetric structure; it also requires the symmetry of syntactic categories and matching acting on asymmetric tense. Again we see the role that the syntactic and semantic symmetries and asymmetries must play.

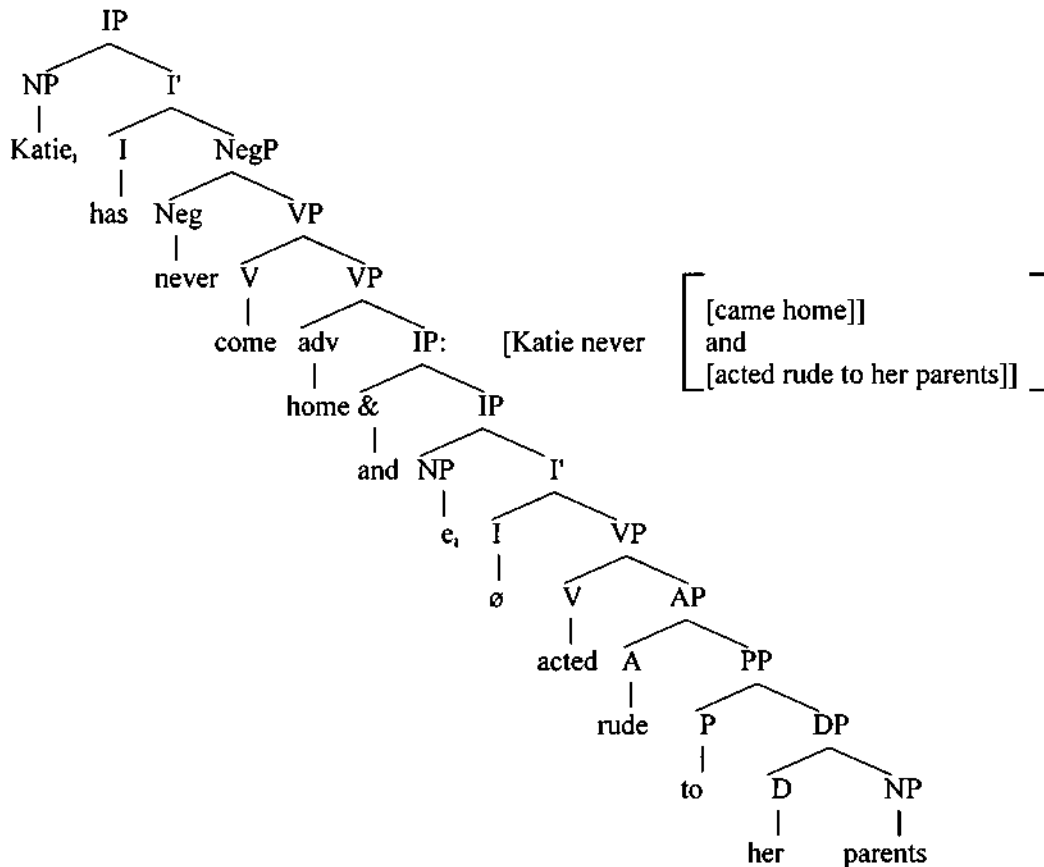
The lack of a gap for *never* in the second conjunct of (39) follows from the structural asymmetry of the coordinate structure. The second conjunct stands in an asymmetric structural relation to conjunct one, which presumably allows *never* to have scope over both conjuncts as if the conjuncts were VPs. But how? *Never* does not typically have scope over two TPs, not even in the SGC:

¹¹ The contrast in the tenses accomplishes its own purpose which is to allow for the broader time period implicit in the present perfect, but it does this without disrupting the underlying symmetry of the coordination.

- (41) a. Katie didn't come home last night and was upset about a relationship.
 b. Katie hasn't come home and has really frightened us again.

(41) is different than the SGC in (36) in one crucial way: (36) requires a symmetric reading of the two clauses (symmetry based on the tenses). The broad scope of *never* in (36) is possible because it, as a modifier of the verb, is part of the CFM that is required for the only correct reading. So while the surface syntax remains asymmetric, symmetry is created with CFM which could be represented something like in (42) where the parallel conjuncts are both within the scope of *never* and both in the preterite:

- (42) Symmetry of tense and negation within the asymmetric structure of the SGC in (36):



The structure in (42) leaves a number of questions unanswered: For instance: At what point in the derivation does the symmetry of the conjuncts come about? Must it precede the syntactic structure? Or is it a result of conjunction? Does symmetry in the semantics rely on syntactic derivation, or vice versa? One thing is clear: The conjunction of parallel planes shown to the right in (42) does not precede the syntactic derivation (like a “deep structure”). There is no theory of syntactic derivation that would get the asymmetric structure out of the symmetric structure on the right and claim to be minimalist. We must conclude that they both exist, side by side, one for the syntax, the other for the semantics and logical form. (42) is one more reminder of the form-meaning dichotomy in language.

4.4 Peripherality and the CFM

The “peripherality requirement,” as I have referred to it, can at this point be taken up fruitfully. The proposal I make here is only a first approximation in need of independent evidence.

My proposal is this: the function of [&] as a coordinating conjunction is to select and match; it does not have a projection property. After [&] merges with some category on its left, the next step is the selection of a category on the right as a potential conjunct. The grammatical operation which checks the selection of a category is CFM. CFM, triggered by the entry of [&] into the derivation, establishes an

agreement or matching relation between categories to the left and right of [&]. The selection of categories and features for matching in CFM proceeds bi-directionally via the asymmetric structure that has been projected from lexical heads.

Because of the natural hierarchies in syntax, the “peripherality requirement” results from CFM: feature matching extends as far as required to find the matching category. Because the domain of the SGC is TP, and the antecedent-subject of the SGC occupies the Spec,TP of the first conjunct, CFM must establish a matching relation from the left periphery of the antecedent TP to the left periphery (Spec position) of the first matching TP on its right. We have already seen that the antecedent in the SGC does not have to be left-peripheral with respect to the first clause as a whole, as it may have a CP projection. This indicates that CFM reads categories and not structures:

(43) [_{CP} In Italien schätzt [_{TP} man, Rotwein und [_{TP} e, hasst die Franzosen]]]

In the OGC left-peripherality consistently results in both the antecedent and the gap occupying the leftmost syntactic position, simply because the antecedent and gap must both be in their respective Spec,CP positions, and there is no category higher than CP.

The question arises: why does the OGC require Topicalization, resulting in left-peripherality? My answer is that CFM is asymmetric with respect to how it identifies categories and heads within the asymmetric phrase structure: it is able to “move” through the structure on its left to the limits of the matching domain to find a match for the category selected on its right. If TP is selected on the right, then it selects TP on the left -- the case in the SGC. In the OGC a CP must be identified on the left to match the selected CP on the right. In this respect CFM is constrained by a general asymmetry in syntax: movement is always to the left.

In the next section we take up the derivational steps for the SGC and the OGC with the aim of making the syntax and semantics of these constructions more precise and to pinpoint why the OGC is a highly marked construction.

5. Deriving the SGC and the OGC

Both construction types require a sequence of derivational steps involving some form of Merge (for discussion of Merge versus Pure Merge see Chomsky 1998), but they differ in one crucial way: the SGC does not utilize an optional movement which requires the projection CP. It would seem that because the OGC can derive only after an “optional” movement, it is more marked. But its markedness has other sources: the additional steps required.

We return to German for a brief look at the steps required in the derivation of the two construction types, as some aspects of its syntax, in particular V2 and topicalization, follow from well-defined, non-controversial parameters. The derivation of the German SGC in (24) requires minimally the steps outlined in (44):

(44) The Derivation of the SGC

In Italien schätzt man Rotwein und hasst die Franzosen

In Italy treasures one.nom red-wine and hates the French

"In Italy people treasure red wine and hate the French."

1. Merge and Select operating on the lexical array {man, Rotwein, schätzen, in Italien} generating:

$$[_{VP} \text{ man } [_{VP} \text{ in Italien } [_{V'} \text{ Rotwein } [_{V} \text{ schätzen}]]]]$$
2. $V \rightarrow T$ + agreement, project TP, deriving:

$$[_{TP} \text{ man } [_{T'} \text{ schätzt}_t, [_{VP} \text{ in Italien } [_{V'} \text{ Rotwein } t_i]]]]$$
3. Topicalization + $V \rightarrow C$, CP projection:

$$[_{CP} [\text{in Italien}]_j, [_{C'} \text{ schätzt}_t, [_{TP} \text{ man } t_i, t_j, [_{VP} \text{ Rotwein } t_i]]]]$$
4. Merge {CP, und}, project TP:

$$[_{CP} \dots [_{TP} \text{ und}]]$$
5. Merge and Select operating on the lexical array {man, hassen, die Franzosen} generating (with $V \rightarrow I$):

$$[_{CP} \dots [_{TP} \text{ und } [_{TP} \text{ man } [_{T'} \text{ hasst}_t, [_{VP} \text{ die Franzosen } t_i]]]]]]$$
6. CFM between the TPs, second *man* marked for non-spell-out, coindexation:

$$[_{CP} [\text{in Italien}]_j, [_{C'} \text{ schätzt}_t, [_{TP} \text{ man}_k, t_i, t_j, [_{VP} \text{ Rotwein } t_i, [_{TP} \text{ und } [_{TP} \text{ D-man}_k, [_{T'} \text{ hasst}_t, [_{VP} \text{ die Franzosen } t_i]]]]]]]]]]$$
(D= “delete” i.e. non-spell-out)

The fifth step in this derivation includes a “sub-step” as a part of CFM: $V \rightarrow T$ raising. As part of matching, this raising must occur, otherwise matching will fail. Of course CFM does not induce it; the verb *hassen* is attracted to I in the same way as *schätzen* is attracted in the first conjunct: as a requirement for agreement.¹² *Hasst* checks the element in Spec,TP, in this case an element bearing the same features as *man* in the first conjunct (as determined by CFM). For this reason it can be marked for non-spell-out and coindexed with its antecedent. The element marked for non-spell-out has all the properties of the actual lexical item except for phonological realization in PF.

The derivation of the OGC includes additional steps; they are the source of its markedness:

(45) **The Derivation of the OGC**

Den Rotwein mögen die Italiener und trinken die Franzosen auch viel

The.acc red-wine like the Italians and drink.pl the.nom French.pl much

"Red wine the Italians love, and the French drink it a lot too." (Or: "The Italians love red wine and the French drink it a lot too.")

Steps 1 - 5 as in (44), producing:

[_{CP} den Rotwein, [_{C'} mögen, [_{TP} die Italiener t_i [_{VP} t_j t_i
[und [die Franzosen trinken_k [ihn [auch viel t_k]]]]]]]]]]

6. Topicalization + $V \rightarrow C$, CP projection: [_{CP} ihn_i [_{C'} trinken_k [_{TP} die Franzosen t_k [_{VP} auch viel t_i t_k]]]]]

7. Match CPs¹³, D-mark *ihn*, coindexation: [_{CP} D-ihn_j [_{C'} trinken_k [_{TP} die Franzosen t_k [_{VP} auch viel t_j t_k]]]]]]

8. Extend chain of *ihn* to *den Rotwein*

[_{CP} den Rotwein, [_{C'} mögen, [_{TP} die Italiener t_i [_{VP} t_j t_i
[_{CP} und [_{CP} e_j trinken_k [_{TP} die Fr. t_k [_{VP} auch viel t_j t_k]]]]]]]]]]

The non-spell-out of the topicalized element *ihn* makes the OGC a particularly marked construction. The reason is clear: *ihn* forms the head of a chain. With *ihn* deleted, this chain must be extended to the previous conjunct, all the way to its antecedent, *den Rotwein*, in Spec,CP. This kind of chain formation is legitimate because of the properties of the Spec,CP position, but also because of the properties of coordination: when matching of conjuncts occurs, symmetries are established by CFM, laying the basis for non-spell-out and for the extension of syntactic chains.

The OGC is a highly marked construction because of the intricacies of its syntactic and semantic relations: a high degree of symmetry must exist so that elided elements can be recovered. For recovery of non-spelled-out elements it must be possible to extend a syntactic chain over two conjuncts. But it is not for reasons of binding that it is impossible to have more than one elided element, as B & H argue.¹⁴ Rather, the V2 parameter in German rules this possibility out (see also note 9 for an English equivalent where this possibility exists):

(46) a. *Das Referat, schreibt Peter, diese Woche und e_j hält t_i dann nächste Woche

The presentation writes P. this week and holds then next week

"Peter is writing the presentation this week and will give (it) next week."

¹² It would seem unfounded theoretically for $V \rightarrow T$ to be induced by matching itself, as that would amount to giving the syntax and semantics of coordination precedence over the syntax in general. However, it may be defensible to argue that the merging of *und*, a coordinating conjunction, automatically places a symmetry requirement on the structure which amounts in this case to the merging of an TP to match the first conjunct. If a TP is merged, then of course $V \rightarrow T$ must occur. There are some broad implications here which will have to be left to further research, one of which is whether German has a default V2 word order in some cases (default triggering of $V \rightarrow T$), for instance in the coordination of TPs.

¹³ I am assuming that when matching occurs the node [_{TP} und] becomes [_{CP} und]. The highest coordinate node that can be selected and merged (before matching) is TP, as the node CP comes about after topicalization applies. Presumably then CFM does not apply until after topicalization in the second conjunct.

¹⁴ B & H argue that constructions like (46b) are not permitted because of a restriction on pronoun binding, following their basic assumption that the second conjunct is within the binding domain of whatever element in the first conjunct it is adjoined to. Space limitations do not allow a thorough critic of this approach.

- b. Das Referat, schreibt Peter, diese Woche und e_i hält *e_j/er/ein Freund dann nächste Woche t_i
 the presentation writes P. this week and holds e/he/a friend then next week
 "The presentation Peter is writing this week and e/he/a friend will give it next week."

A strictly symmetric approach to coordination, one which represents conjuncts in parallel planes or with symmetric phrase structure, cannot account for the markedness of the OGC as compared to the SGC; it should be equally unmarked, as both conjuncts can have the same syntactic relation to the shared element:

(47) The SGC in parallel planes:

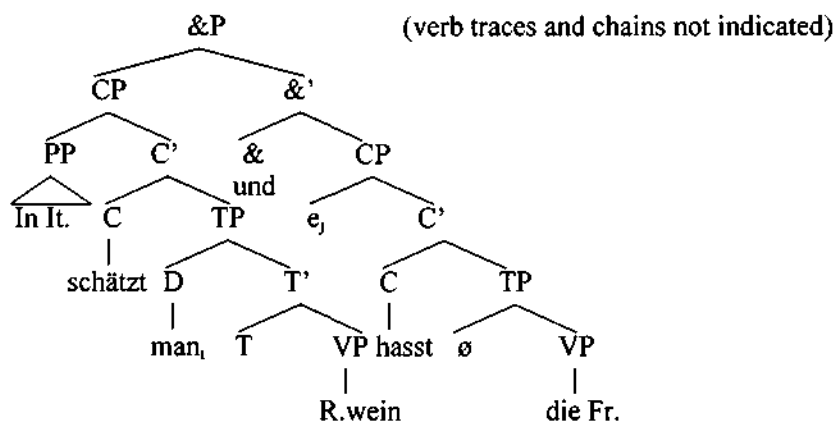
Rotwein
 In Italien schätzt man und
 In Italy treasures one red-wine and hates the French

(48) The OGC in parallel planes:

mögen die Italiener
 Den Rotwein und
 trinken die Franzosen auch viel
 The.acc red-wine like the Italians and drink the French (nom) also much

A strictly asymmetric approach to coordination on the other hand, one which assumes that [&] projects a phrase (cf. Johannessen 1998), faces other problems. In (49) is an analysis of an SGC in strictly asymmetric syntax and according to the assumption that V always raises to C:

- (49) In Italien schätzt man Rotwein und hasst die Franzosen
 In Italy treasures one red-wine and hates the French



Besides the problem of explaining how a conjunct is adjoined to [&P] -- adjunction being a movement operation for elements in this position -- it is not possible for *man*, the antecedent of the gap, to c-command the position that the gap occupies. This problem would also affect the scope of *never* in *Katie has never come home and acted rude to her parents*. Coordinate symmetries evident in the SGC are also not represented: the position of *man* and the symmetric gap coindexed with it are not symmetric. This problem could be solved by assuming that the gap is in Spec,TP, but doing so would eliminate the empirical basis for the structural constraint on the SGC: that no element may occur before a finite verb in the second conjunct. On the other hand, assuming the gap is in Spec,TP would make the two conjuncts more symmetric and thereby more suitable for matching, which has independently been shown to occur in coordinate structures.

Conclusion

The approach to subject and object gaps presented here accounts for both the symmetries and asymmetries of the coordinate constructions in which they occur: the asymmetries fall out from the asymmetric phrase structure, and the symmetries from CFM, the matching of features significant to a well-formed, grammatical coordinate structure. I have assumed that matching proceeds feature-by-feature within an asymmetric phrase structure, selecting appropriate features within symmetric categories and constrained by the fundamental left versus right asymmetry found in movement operations. This approach also provides an account of how language-specific parameters, specifically V2 and topicalization in German, interact with the SGC and the OGC.

More generally, a theory of coordination that is feature-driven is more compatible with the Minimalist Program for several reasons: 1) Because it is feature-driven, it can utilize a mechanism that is needed for syntax theory in general, feature matching, though it must be feature matching for a different purpose: not to eliminate any features but to determine whether symmetry is attained. 2) Because it is feature-driven, the properties of asymmetry found in coordination can fall out naturally from asymmetric phrase structure, and the symmetries of coordination can be captured by a principle shown independently to be a central property of coordination, particularly of elliptical coordinate structures. 3) Because it is feature-driven, it relies less if at all -- the degree to be determined by further research -- on extra mechanisms and stipulation; it is therefore more optimal, addressing the central challenge of the Minimalist Program.

A number of questions remain: What is the nature of the syntax-semantics interface in coordinate structures with regard to symmetry and asymmetry? At what points in the derivation does symmetry play a role? Does semantic symmetry exist parallel to asymmetric syntax, or must semantic symmetry be the starting point of any coordinate structure? What formal features help establish symmetry? Clearly there is much remaining for further research, if the approach presented here proves promising.

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