

# A phrase-structure based approach to German asymmetric coordinations

Berthold Crysmann

In this paper, I shall discuss a peculiar coordination construction in German, where the shared subject of the two conjuncts is not found peripheral, but is contained within the first conjunct. Following Höhle (1983), this construction is called “Subject Gaps in Finite/Fronted” clauses (SGF).

- (1) In den Wald ging der Jäger und fing einen Hasen.  
into the woods went the hunter and caught a rabbit  
‘Into the woods went the hunter and caught a rabbit.’
- (2) In Italien schätzt man Rotwein und haßt die Franzosen.  
in Italy appreciates one red wine and hates the French.  
‘In Italy, one appreciates red wine and hates the French.’

The construction displays some quite specific properties: while the first conjunct can be a verb second clause, as above, or a verb first clause, as given below, the second clause is invariably verb-first:

- (3) Ging der Jäger in den Wald und fing einen Hasen?  
went the hunter into the woods and caught a rabbit  
‘Did the hunter go into the woods and catch a rabbit?’

Furthermore, closely related asymmetric coordinations, as illustrated in (4), show that the first conjunct may even be a verb-final clause.

- (4) Wenn Du in ein Kaufhaus gehst und hast kein Geld, kannst Du Dir nichts kaufen.  
if you in a store go and have no money can you yourself nothing buy  
‘If you go to a store and have no money, you cannot buy yourself anything.’

What is peculiar about the example in (1) is the apparent violation of the Coordinate Structure Constraint (Ross, 1967): the fronted PP *in den Wald* is a directional complement of the verb in the first conjunct only.

Sharing of the subject in this construction does not, however, generalise to other grammatical functions, as illustrated below:

- (5) \* Gestern kaufte Hans den Wagen<sub>i</sub> und meldete sein Sohn  $e_i$  an.  
Yesterday bought Hans the car<sub>i</sub> and registered his son  $e_i$   
‘Yesterday Hans bought the car and his son registered (it)’

Finally, Buring & Hartmann (1998) observe that the subject contained in the first conjunct takes wide scope, akin to across-the-board extraction of subjects.

- (6) a. [Daher kaufen die wenigsten Leute ein Auto] und [fahren mit dem Bus].  
therefore buys almost no one a car and take the bus  
‘Therefore, almost no one buys a car and takes the bus.’  
b. Die wenigsten Leute [kaufen ein Auto] und [fahren mit dem Bus].  
Almost no one buys a car and takes the bus  
‘Almost no one buys a car and takes the bus.’

## 1 Previous approaches

The analytical paradox presented by German SGF coordination lies with the fact that the asymmetric extraction from the first conjunct suggests high coordination of what would be called a CP in mainstream generative grammar, yet such a high coordination would make subject sharing and the associated wide scope difficult to capture.

Büring & Hartmann (1998) approach the issue of the apparent violation of the Coordinate Structure Constraint by abandoning the idea of a coordination analysis and argue instead for an asymmetric analysis where the second “conjunct” is considered an open proposition that is adjoined to what would otherwise be considered the first conjunct. They assume that the missing subject is licensed by an empty operator in the specifier of CP, which in turn is bound by the overt subject in the main clause. Büring & Hartmann (1998) liken this approach to that of tough constructions and parasitic gaps in GB theory. However, what remains unclear is how the specific restriction to subject gaps is obtained. Frank (2002) points out that an adjunct analysis makes it difficult to rule out extraction of the second “conjunct”, a criticism which I share.

Frank (2002) proposes an LFG analysis which is indeed symmetric at the level of constituent structure, assuming coordination of two CPs, where the specifier of the second CP is an empty NP (or DP). Since both conjuncts are full CPs, extractions apply within each conjunct, avoiding any violation of the Coordinate Structure Constraint. Projection of  $f$ -structure, however, is asymmetric, where grammaticalised discourse functions (TOPIC, FOCUS, SUBJ) of the coordinate structure are projected from the first conjunct only, as given by the annotated  $c$ -structure rule in (7).

$$(7) \quad \begin{array}{ccc} \text{CP} \rightarrow \text{CP} & & \text{Conj CP} \\ \downarrow \in \uparrow & & \uparrow = \downarrow \quad \downarrow \in \uparrow \\ ((\downarrow \text{GDF}) = (\uparrow \text{GDF})) & & \end{array}$$

The interesting case here is GDF being SUBJ: by way of the annotation in (7), the first conjuncts SUBJ will be the SUBJ value of the  $f$ -structure containing the set of coordinated  $f$ -structures. According to standard LFG assumptions, this property is then distributed of all set members, accounting for the identity of subjects across the two conjuncts. Frank (2002) further argues that the resulting  $f$ -structure is identical, in all relevant aspects, to the one obtained for ATB extraction of subjects, such that the same wide scope readings can be derived in semantics. The LFG assumption regarding the availability of grammatical functions beyond the point where they get saturated/instantiated provides crucial for her analysis, making it possible to reconcile subject sharing with CP coordination.

Within HPSG, the linearisation approach by Kathol (1999) equally adopts a symmetric approach at the phrase-structural, or tecto-grammatical level, but permits the shared subject to be factored out in linearisation, i.e. at the pheno-grammatical level. He regards SGF coordinations as essentially a word order variation of a subject ATB extraction. While the basic idea appears plausible, Kathol needs to invoke a special condition for subjects in order to work around the problem that the first conjunct’s subject does not seamlessly linearise with the domain list of the second conjunct. Frank (2002) argues rather convincingly that this condition lacks any independent motivation.

In an unpublished presentation, Crysmann (2006) reported on the implementation of SGF coordination in a DELPH-IN grammar of German. He suggests to build on the UDC analysis of topic-drop already present in the grammar and proposes an asymmetric, construction-specific coordination schema that combines a slashed verb-first clause on the right with a fully saturated clause on the left. While it captures the basic facts, this analysis is rather ad hoc, postulating coordinate structures that are in blatant violation of the Coordinate Structure Constraint.

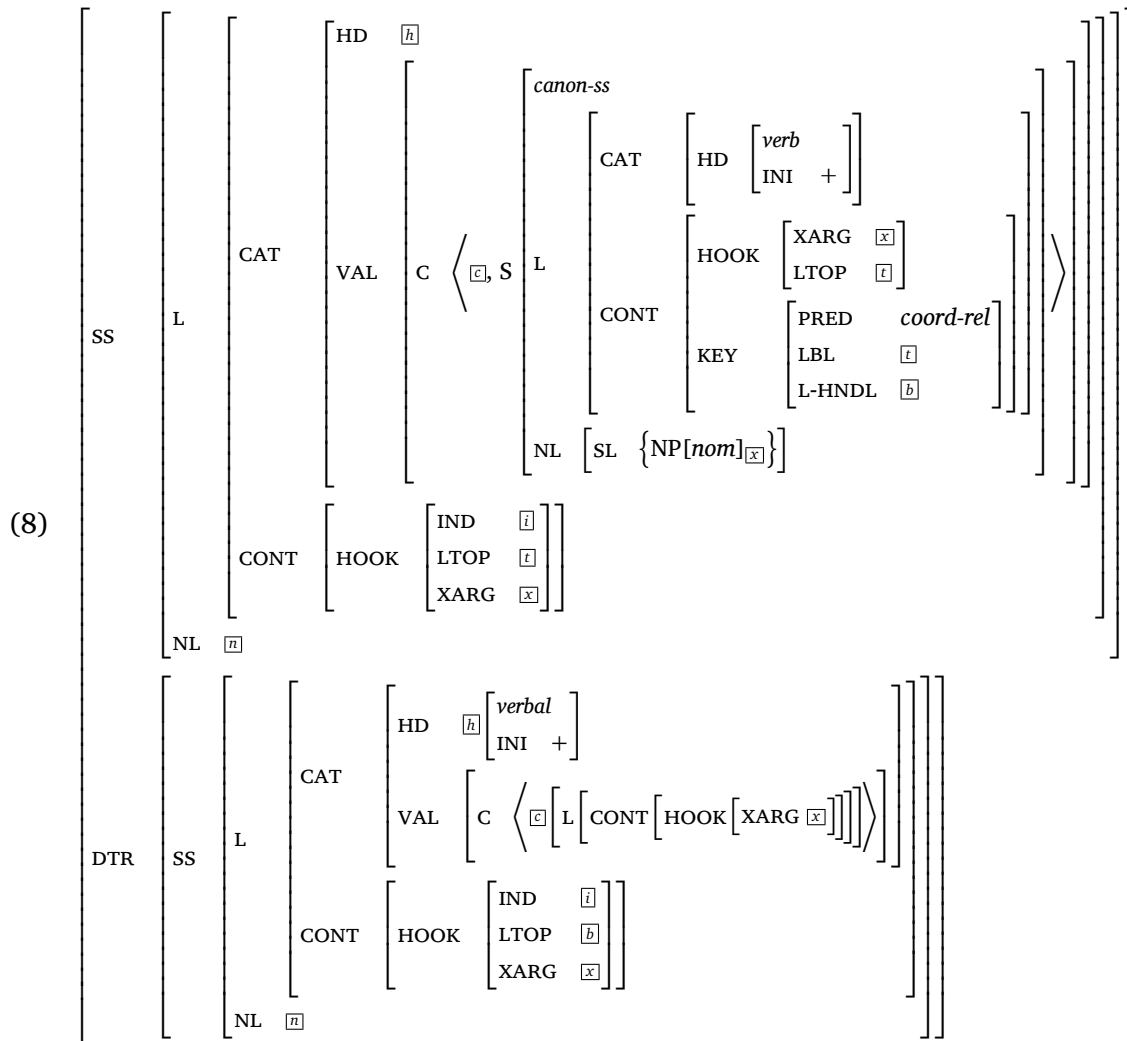
## 2 Towards a constituency-based analysis

One of the most pressing tasks for an analysis of German SGF constructions is to ensure that the missing subject of the second clause can be identified with the subject contained within the first clause. In LFG, grammatical functions are readily available at the sentential level: as a consequence, Frank (2002) merely has to constrain asymmetric projection to GDF, thereby excluding all argument functions other than SUBJ from undergoing sharing in the SGF construction. HPSG, by contrast, adopts a CG view of valence cancellation, such that internal grammatical functions are in general not detectable in the feature structure of a saturated sign, thereby implementing a strict notion of selectional locality. However, subjects have been found to be special: Sag (2007) proposes a (*sign/synsem*-valued) feature XARG that exposes the properties of a realised subject on the feature structure of the saturated phrase it is a part of. In English, this is used in the analysis of “copy raising” or certain idiomatic expressions. For German, this necessity has been argued for by Kathol (2003) in the verbal domain, and by Machicao y Priemer & Müller (2021) for NP syntax. Similarly, though not quite identically a purely semantic XARG feature exposes the index of the external argument in Minimal Recursion Semantics (Copestake et al., 2001). Thus, we can conclude that at least INDEX information about the subject of finite clauses will indeed be available at the level of the saturated sign.

In a first approximation, I would like to explore how the equivalent of CP coordination could be captured in HPSG. An analysis along these lines would postulate a coordinate structure where both conjuncts are fully saturated signs, i.e. having empty SLASH and empty valence lists: e.g., the first conjunct could be a head-filler structure (as in (1)), while the second conjunct would be analysed as subject topic-drop, i.e. either as a head-filler structure with an empty NP filler, or else as a unary construction that establishes the same effect. Given the excursion about XARG in the previous paragraph, it is straightforward to impose the identity of subject indices, it is far less clear how to impose the other two pertinent restrictions on the second conjunct, namely that the subject be the filler, and necessarily empty: once a filler has combined with a head, the resulting sign does not keep track of what the exact properties of the filler were. Furthermore, the CP coordination analysis runs into problems, once we consider verb-initial structures, as in (3): since verb first and verb second structures do not generally coordinate in German, it should come as a surprise if they do so only for the sake of a sub-case of SGF coordinations.

Once we drop the assumption that the second clause in the SGF construction be a fully saturated sign, but assume it instead to be a saturated sign with a subject in SLASH, the aforementioned problems disappear: since an unsaturated SLASH dependency is represented as a property of the clause, it is straightforward to capitalise on its existence, and furthermore, constrain its properties. What is less straightforward, however, is an analysis in terms of syntactic coordination, since it will inevitably fail to comply with the Coordinate Structure Constraint: given that the SLASH value of the second conjunct is, by hypothesis, the subject, and the SLASH value of the first conjunct in the SGF construction is not (cf. examples (1) and (3)), the conditions for ATB extraction are simply not met.

Instead of integrating the slashed second clause as a conjunct in a coordinate structure, I shall instead propose to treat it as a dependent. While similar in spirit to Buring & Hartmann (1998), I shall treat the second clause as a complement, rather than an adjunct. Most importantly, this will provide more fine-grained control on extraction. Concretely, I propose to implement this analysis by means of a type-shifting lexical rule, given in (8), that applies to head-initial verbal element (i.e. verbs in the left sentence bracket and complementisers).



What this rule does, is augment the C(OMPS) list of an initial verb or complementiser with an additional slashed sentential complement that corresponds to the second conjunct. More specifically, this additional complement is constrained to be headed by a coordinating relation (via KEY|PRED). While the second conjunct is treated syntactically as a complement, the coordination relation it provides will function as the semantic head: as stated in (8), the LTOP of the rule's daughter ( $\bar{b}$ ) is subordinated to the L-HNDL of the complement's coordination relation and the mother's LTOP is indeed the LBL of the coordination relation introduced by the additional complement ( $\bar{t}$ ). On the syntactic side, the additional complement (vulgo: the second conjunct) is constrained to be a verb-initial clause with a nominative element in SLASH that is co-indexed with the XARG of the first complement ( $\bar{x}$ ). This type-shifting rule applies to the left bracket of verb second, verb first, and complementiser-introduced verb final sentences alike, thus deriving (4) in addition to (1) or (3).

Finally, taking the left clause asymmetrically as the syntactic head of the construction not only evades any problems regarding the Coordinate Structure Constraint, but it also makes it more easy to determine the overall clause type, be it in terms of a declarative vs. interrogative distinction, as signalled by a verb second vs. verb first alternation, or be it by the  $\pm$ wh distinction, as determined, again, solely by the first constituent of the initial clause.

## References

- Büring, Daniel & Katharina Hartmann. 1998. Asymmetrische Koordinationen. *Linguistische Berichte* 174. 172–201.
- Copestake, Ann, Alex Lascarides & Dan Flickinger. 2001. An algebra for semantic construction in constraint-based grammars. In *Proceedings of the 39th Annual Meeting of the Association for Computational Linguistics, Toulouse, France*, .
- Crysmann, Berthold. 2006. GG — an efficient and reversible HPSG for German. Workshop on large-scale grammar development and grammar engineering, CRI, University of Haifa, Haifa, Israel, 25–28 June.
- Frank, Anette. 2002. A (discourse) functional analysis of asymmetric coordination. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG 2002 conference*, 174–196. Athens: CSLI Online Publications.
- Höhle, Tilman. 1983. Subjektlücken in Koordinationen. Ms., University of Cologne.
- Kathol, Andreas. 1999. Linearization versus phrase structure in German coordinate constructions. *Cognitive Linguistics* 10. 303–342.
- Kathol, Andreas. 2003. Subjects in fronted German VPs and the problem of case and agreement: Shared argument structures for discontinuous predicates. In Jongbok Kim & Stephen Wechsler (eds.), *On-line proceedings of the 9th International Conference on Head-Driven Phrase Structure Grammar (HPSG 2002)*, 91–108. Stanford: CSLI Publications. <http://csli-publications.stanford.edu/HPSG/3/>.
- Machicao y Priemer, Antonio & Stefan Müller. 2021. NPs in German: Locality, theta roles, possessives, and genitive arguments. *Glossa: a journal of general linguistics* 6(1). doi: 10.5334/gjgl.1128.
- Ross, John R. 1967. *Constraints on variables in syntax*: MIT dissertation.
- Sag, Ivan A. 2007. Remarks on locality. In Stefan Müller (ed.), *The proceedings of the 14th international conference on head-driven phrase structure grammar*, 394–414. Stanford: CSLI Publications. <http://csli-publications.stanford.edu/HPSG/8/>.