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RESEARCH

Against information structure heads: A relational analysis of German scrambling

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This article argues against cascades of information-structural functional heads in the German middle field as an explanation for scrambling movements. Instead, we argue, some instances of scrambling correlate with sentence-level semantic effects, whereas other word order changes are affected by prosody and do not have any interpretative effects. An alternative architecture for scrambling is developed, which takes into account the clear empirical differences between these different subtypes of what is summarily called 'scrambling'. In this architecture, syntax underspecifies word order and is ignorant of information structure. The apparent interaction of word order, semantic interpretations and discourse is explained by an interface architecture that licenses word orders on the basis of their syntactic, semantic and prosodic (but not information structural) properties.

Keywords: scrambling; features; semantics; prosody; information structure

1 Introduction: Scrambling by formal features

At least since the seminal work of Lenerz (1977), information structure has been considered an important factor for the description of word order in German. Previously, word order in the middle field had been regarded as essentially 'free', in so far as argument and adjunct phrases could be arranged in any conceivable order. While Lenerz acknowledges this fact, he points out ordering principles that make certain word orders more or less marked in specific contexts. Two of these restrictions have proven to be promising empirical generalizations to this day:

- The scrambling of indefinite DPs (noun phrases, in his terminology) is subject to restrictions that do not hold for definite noun phrases. Scrambling indefinites is therefore a more marked option than is scrambling definite DPs.
- The scrambling of focussed phases (rhemes, in his terminology) is more *marked* than the scrambling of phrases that are not focussed.

In later generative research, this (essentially relational) characterization was restated in terms of structural target positions: Formal features (*FFs*) of middle field functional heads attract certain information structural categories (e.g., topic, anti-focus) to their respective specifiers. For example, movement of a topicalized (and un-focussed) argument across a modal particle would have been represented by (some variant of) the following structure (cf. Meinunger 2000; Frey 2004; Hinterhölzl 2012, amongst others):

(1) $[_{CP}$ XP V_{+fin} $[_{TP}$ ... $[_{TopP}$ $DPs_{-Foc/+Top}$ ... Top^0 [particle $[_{vP}$ ... $DPs_{\pm Foc, -Top}$ ...]] (V_{-fin})]]]

left middle field *right middle field*

In contemporary research, many technical aspects of these information structure-driven movements have been called into question. To name but one, the connection between feature licensing and movement is essentially stipulated in current generative theory, since features are not necessarily licensed locally. Instead, the operation Agree can value features across long (if limited) structural distances. Unlike in previous implementations of movement via specifier-head relations, therefore, movement need not be invoked in the explanation of agreeing feature sets. In the new system, movement is therefore stipulated by the addition of an EPP feature to the other agreeing features. The EPP essentially just stipulates that the agreement goal will move. However, this stipulation jars with the empirical facts in the case of optional movements. Here, only the EPP feature's ad libitum presence and absence can be stipulated, essentially depriving the EPP approach of most of its predictive power. However, in some cases, even this approach does not do justice to some word order phenomena. With German scrambling, subtle preferences and dispreferences exist for certain word orders in certain contexts. Feature-driven movement analyses, therefore, had to accept from the start that their predictions were always a bit rough around the edges. Movement could be enforced for certain information structure categories – but the fact that those movements were actually only preferred options, rather than obligatory operations, was never really represented in the model at all.[1]

Scrambling, and related word order phenomena, furthermore display a tendency for parallel movements to take place. In Dutch, for example, arguments can scramble across adverbials and other material, but the scrambled arguments do not readily change their order *relative to each other*. In object-shift languages, similar parallel movements are observed, and even in German, parallel movements are the most unmarked option for scrambling (cf., e.g., Müller 2001; Putnam 2007) – although not the only one, as we have seen above. Again, feature-driven movements cannot replicate this state of affairs all too convincingly: Meinunger (2000) proposes, for example, to equip the information structural target positions with Case-licensing features, so that the base order of arguments (in German, subject > indirect object > direct object[2]) is replicated in the left middle field. However, this representation falls short of the fact that other orders, albeit more marked, are possible. To add additional Case-marked target positions, to cater to the more marked word order options, however, is no solution. Under that analysis, word order is predicted to be 'free' again, since syntactic derivations then generate both marked and unmarked orders as completely *equally* well-formed.

Last, but not least, cartographic analyses would border precariously on circularity theoretically even if they did make the right predictions empirically. Although some authors seem to assume that adding a target position for a certain type of movement constitutes an explanation for the movement, massive doubts can be raised against this general type of 'explanation': Suppose that we find that an argument with a property x moves to a certain position. We therefore stipulate a target position, XP, which attracts the displaced x-argument to its specifier. This allows us to represent the distribution of the x-argument, but not to truly explain it, we insist. After all, why should XP be located where it is, rather than anywhere else in the structure? Cross-linguistically, why is it that x should be a relevant factor for word order in the language under discussion – when x-arguments simply do not share a uniform

[1] Note that related proposals using, e.g., referential dependency to explain differences between moved vs. in-situ DPs (cf. Hinterhölzl 2013) run into a similar problem: Examples where word order and referential potential dissociate are easy to find, once stress placement is taken into account.

[2] This base order holds for full DPs, not pronouns and for many, but not all verbs.

distribution in other languages in the first place? We cannot explain gravity by stating that 'the ground is the natural place for objects to be'. Likewise, the question 'why does the x-argument move to the XP?' cannot be answered by simply stating that 'that is the position it has to move to'.

In this paper, we will argue for an alternative to feature-driven movement for the analysis of German scrambling phenomena (cf. the similar aims of, e.g., Neeleman & Reinhart 1998; Fanselow 2003; 2012; Neeleman & van de Koot 2008). The approach advocated here does away with cartographic target positions and instead argues for a 'subtractive' grammatical architecture:

- Word order changes that have been subsumed under the label 'scrambling' are actually caused by more than one type of word order-changing operation (as pointed out already by, e.g., Neeleman & van de Koot 2008; Fanselow 2012; Hinterhölzl 2012).
- Only one of these reordering processes is purely syntactic (implemented by internal merge), whereas the other is implemented by syntactic operations whose output is assessed at the interface of syntax and prosody.
- Neither of these operations is driven by *FFs* that attract x-arguments to XP target positions. Instead, both of these operations apply freely, but are licensed by restrictions on the **relational output configurations** that their application produces.
- Under these assumptions, syntax determines sentence-level semantics to a large degree, but leaves open question of linear word order to a (almost similarly large) degree.
- Syntax-external systems then further restrict word order options, without affecting syntax itself.
- However, and importantly, the 'subtractive' approach advocated here actively embraces one central empirical prediction, i.e. that for every context (no matter how specifically defined), there may be more than one variation of a sentence (no matter how precisely we define its interpretation) that can and will be considered acceptable. After all is said and done, the set of possible sentences in context is, most often, not reducible to a singleton set, and sometimes by a wide margin.

The typological predictions that this model entails are not discussed in any detail in this paper, for reasons of space. However, delegating empirical properties of scrambling to the phonological interface makes clear that we are, if only in part, dealing with properties that are quite specific to German and warrant an analysis in these terms. Conversely, we may find that even dialect differences regarding, e.g., prosodic factors, could potentially influence scrambling properties.

The paper proceeds as follows: Section 2 outlines central empirical properties that any analysis of scrambling must be able to explain. Most importantly, word order changes in the middle field can either have semantic effects, but can also display the (sometimes surprising) absence of expected semantic effects. Section 3 discusses previous, feature-driven approaches to the phenomenon and concludes that these approaches fail to represent the empirical facts from Section 3 convincingly. Section 4 proposes an alternative approach for the two different kinds of scrambling processes outlined in Section 3. Section 5 demonstrates that this approach can handle a number of additional (and quite bewildering) facts about scrambling. Section 6 concludes.

2 Properties of the middle field: Semantic and asemantic instances of scrambling

In older generative frameworks, scrambling was variously considered as A or A' movement, respectively. To the best of our knowledge, no consensus was ever reached between these two positions – and for good reason: Given the empirical facts that both camps adduce, scrambling simply cannot be subsumed under either movement type entirely. "It is practically a lost cause to attempt to categorize Scrambling along the lines of the traditional A- or A'-movement characteristics. Isomorphic reflexes for either movement type simply do not exist" (Putnam 2007: 93). There is clear evidence that word order changes in the middle field come in (at least) two distinct variants:

- Some instances of scrambling have clear-cut semantic effects (section 2.1).
- Other word order changes occur without (demonstrable) interpretative effects (section 2.2).

2.1 Scrambling (some) argument phrases can (sometimes) lead to semantic effects

In some cases, scrambling can have quite noticeable semantic effects, many of which are acknowledged and described in the literature. For example, there can be no doubt that scrambling QPs can avail these QPs of new scopal properties (cf., e.g., Frey 1993; Bobaljik & Wurmbrand 2012; Fanselow 2012; Hinterhölzl 2012). Witness the difference between a) and b) in:

(2) a. weil der Arzt **nicht** [ALLe Patienten] heilt
since the doctor.NOM not all patients.ACC heals
'since the doctor cannot heal all patients' *(...but some, salient reading ¬∀)*

b. weil der Arzt [ALLe Patienten] **nicht** heilt
'since for all patients, the doctor cannot heal them' *(... i.e., none, salient reading ∀¬)*

Not only the scrambling of quantified material across negation elements yields semantic effects, but the scrambling of QPs across each other leads to scopal ambiguity, as has been pointed out in the literature: While there are endless complications when different prosodic realizations are taken into account, at least under some prosodic implementations (e.g., verum focus), the base order has only the surface scope reading (Frey 1993). Orders that deviate from the base order are either interpreted with an inverted reading (cf. Hinterhölzl 2004) or else are interpreted as ambiguous between the two scopal readings (cf. Frey 1993). Similar effects hold for the relative scopal readings of adverbial adjuncts (cf. Frey & Pittner 1998). In all of these cases, scrambling has clear-cut semantic effects.

Scrambling can also influence the interpretation of bound elements in the middle field (example by Hinterhölzl 2006):

(3) a. ??weil seine$_i$ Mutter jeden$_i$ liebt *(possessor binding not possible)*
since his mother.NOM everybody.ACC loves
'since everbody is loved by their mothers' *(intended)*

b. weil jeden$_i$ seine$_i$ Mutter liebt *(possessor binding available)*
'since everbody is loved by their mothers'

Whereas the reciprocal *einander* can hardly be interpreted as bound by the (following) direct object in a) under most prosodic renderings, the reading becomes available unproblematically when the direct object comes to precede *einander* via

scrambling, as in b. Thus, scrambling can feed binding interpretations, as expected, e.g. under analyses that consider scrambling an instance of A-movement (e.g., Meinunger 2000).

Finally, elaborating on Lenerz' 1977 findings, the scrambling of indefinite DPs has been shown to trigger genericity effects along the lines of Diesing (1992). While the data are not entirely clear-cut, interpretative effects can sometimes be quite obvious (cf. Lenerz 2001):

(4) a. weil ein Feuerwehrmann ja immer bereitsteht
since a firefighter.NOM particle always ready-stands
'because firefighters are always ready' *(generic: for all firefighters...)*

b. weil ja immer ein Feuerwehrmann bereitsteht
'because there is always a firefighter on duty' *(existential: some firefighter or other...)*

In sum, there appear to be quite a number of word order changes in the German middle field which clearly influence sentence-level semantic interpretations. This should put to rest any hopes that scrambling could be considered as a post-syntactic, asemantic operation (say, a phonological movement operation of some sort). However, as the following subsection demonstrates, there also exist some word order changes which do not have interpretative effects.

2.2 Scrambling arguments without semantic effects – even when they are expected

The semantic effects outlined in 2.1 depend on the syntactic categories of the scrambled phrases (Q, Neg, anaphors, reciprocals, indefinites). In other constellations, of course, an effect on outcome for the semantics (henceforth, *EoO*) is not expected when other kinds of elements scramble. For example, scrambled definite DPs cannot trigger genericity effects and are not necessarily implicated in binding or scopal constellations. Note, however, that precisely the scrambling of definite DPs is not only possible in German, but even constitutes the most liberal type of re-ordering in the middle field. Some authors even generalize that "definites are free to scramble" (Molnárfi 2002: 1112; cf. also Bayer & Kornfilt 1994: 34; Abraham & Molnárfi 2001: 22, amongst others). Examples are, consequently, not hard to find:

(5) a. weil ich das Geld dem Kellner gegeben habe *(iO < dO)*
b. weil ich dem Kellner das Geld gegeben habe *(dO < iO)*
because I.NOM to-the waiter.DAT the money.ACC given have
'because I have given the money to the waiter' *(reading for a and b)*

More interestingly, perhaps, the sentence-level semantic effects outlined in 2.1 can also fail to materialize in other settings. Under a prosodic bridge contour (indicated by / and capitalization for the rise part, and capitalization for the main stress fall contour), for example, the scope reversal effect of scrambling is often nullified (cf. Jacobs 1996; 1997; Büring 1997; Krifka 1998):[3]

(6) a. weil der Arzt ALLe Patienten nicht heilt *(reading: ∀¬, cf. 2b)*
b. weil der Arzt /ALLe Patienten NICHT heilt

[3] In the following, the rising part of a bridge contour is placed on the capitalized syllable preceded by a / SLASH, and the falling part of a bridge contour is located on a capitalized syllable withOUT a slash mark. Capitalization without a slash also marks sentence-level main stress GENerally.

'because the doctor does not heal all patients' *(… but some, salient reading: ¬ ∀)*

Producing (2b) (repeated here as 6a for convenience) without a bridge contour, the salient reading transparently reflects the reversed (scrambled) word order. Under the bridge contour, however, a reconstructed reading becomes the salient interpretation (cf. Krifka 1998).[4] Interestingly, binding constellations can be affected by bridge contours, too:

(7) weil [$_{\text{seine}}$ seine$_{\text{i}}$ /SCHUHe] ja PETer$_{\text{i}}$ vergessen hat
since his shoes.ACC MP Peter.NOM forgotten has
'since it was Peter who forgot his (own) shoes' *(no Principle C violation)*

The placement of the direct object before the R-expression *Peter* could be expected to either cause the possessor to be unbound – or a principle C violation if the possessor illicitly binds the subject R-expression – but, in fact, no binding violation occurs. Rather, the possessor is unproblematically interpreted as referring anaphorically to the following (!) subject phrase, contrary to (some) expectations.

In sum, then, many word order changes in the German field occur without semantic *EoOs*, and sometimes, even the absence of expectable semantic effects is clearly attested. Note, however, that not even the asemantic cases of scrambling can be relegated to some post-syntactic component, because scrambling in German seems to adhere to syntactic restrictions: It cannot escape islands, takes place only inside a syntactically defined clause, and targets only the syntactically defined middle field (but no other topological fields) of that clause. While an analysis could, of course, be devised that makes purely phonological displacement operations sensitive to syntactic restrictions, it stands to reason that such a solution could never count as particularly elegant, since it duplicates syntactic constellations in an extra-syntactic component of the grammar. Optimally, asemantic scrambling should base on syntactic operations in such a way that the apparent syntactic restrictions are explained without stipulations.

3 Previous accounts and their problems

Most previous syntactic accounts of scrambling assume some version of the feature-driven approach sketched in (1). For example, both Frey (2004) and Meinunger (2000) assume that there is an information structure-driven movement to the left middle field. For Frey, aboutness topics move to a designated topic projection located above the position of the highest adverbials. Since these topic positions can iterate, more than one topic phrase can be moved to the left middle field, with no further syntactic restrictions on their order. The approach is therefore capable of deriving all scrambling orders in the left middle field – but does not give the unmarked order any special status.

For Meinunger, more than one iterating functional projection exists. Topic features (defined by aboutness and familiarity) are coupled with various Case-licensing features. The resulting cascade of AgrHeads implements the unmarked order of 'parallel' scrambling, where subjects (*Su*), indirect objects (*iO*) and direct objects (*dO*) replicate their base order in the left middle field:

(8) [$_{\text{Agr-S}}$ … Su$_{\text{Top}}$ [$_{\text{AgriO}}$ … iO$_{\text{Top}}$ [$_{\text{AgrdO}}$ … dO$_{\text{Top}}$ …(adverbials) [$_{\text{vP}}$ ~~Su iO dO~~ V v]]]…]

The approach therefore captures the unmarked scrambling case – but does not seem to cater to the more marked scenarios explicitly.

[4] However, the re-constructed reading is not always the only reading, cf. Struckmeier (2014b).

As we will outline in the next two subsections, there are various problems with the empirical predictions as well as the technical implementation of both approaches. The same technical problems hold for similar feature-driven approaches which employ different trigger features for scrambling movements (e.g., antifocus feature, cf. Abraham & Molnárfi 2001; Molnárfi 2002; 2004).[5] Interestingly, neither semantically transparent scrambling, nor asemantic re-ordering phenomena are really captured adequately by feature-driven approaches, as subsections 3.1 and 3.2 outline, respectively.

3.1 Problems of feature-driven approaches with semantically driven scrambling

In Section 2.1, we witnessed some scrambling cases with clear-cut sentence-level semantic effects. As this section demonstrates, these effects are hard for purely feature-driven approaches to come to grips with. The first problem that immediately comes to mind is the status of the target position of the feature-driven movement. Assume that this target is considered as an A-position (supposing the A/A' distinction is formulable in current frameworks). We note right away that the absence of semantic *EoOs* in the cases presented in 2.2 renders the analysis incomplete. Assume, therefore, that both A-positions, as well as A'-positions, are stipulated, to cater to both semantic and asemantic cases of scrambling. Recall that the base order of arguments is replicated in the left middle field, in unmarked scrambling cases. Therefore, some feature specification exists that captures this outcome, say, along the lines of the Case features posited by Meinunger (2000). In order to capture the more marked outcomes, however, we need additional target positions. For the three arguments subject, indirect object, and direct object, we arrive at 3! = 6 possible orders, which require an adequate number of target positions that would implement these six orders. Note furthermore that the base order of pronouns differs from the base order of full DPs. Whereas full DPs (with most verbs) line up as *Su* > *iO* > *dO* by default (and replicate this order in the left middle field), pronouns always line up with reversed object order, i.e. *Su* > *dO* > *iO*. The difference is clearly related to the part-of-speech status of these elements, so that in addition to the target positions for full DPs, we need to add at least two pronoun positions to capture the reversed object order for pronominal objects. Whereas pronouns usually line up in their base order in the Wackernagel position, it does not seem to be entirely impossible to arrive at different, more marked orders as well:

(9) a. weil ich es ihm ja ~~ich es ihm~~ geGEBen habe
because I.NOM it him.DAT particle given have
'because I gave it to him'

b. weil ich IHM es ja ~~ich es ihm~~ gegeben habe

Depending on how many permutations of full DP and pronominal arguments turn out to be empirically attested, we arrive at something like a dozen or so scrambling target positions. Needless to say, an implementation by way of an ever-growing cascade of attracting heads could never be more than a restatement of the facts. This fact has been concealed to a certain degree by the fact that individual contributions in terms of *FFs* never really covered all relevant argument types at once. E.g., no big problems arise when only pronoun orders in the left middle field are analyzed. Representing only semantically transparent, or only semantically intransparent scrambling of full DPs alone indeed requires no outrageous additions to the inventory of functional heads. However, note that these elements and operations can all occur in the language, and even co-occur in individual sentences. The problem of forever adding target positions for the more complicated cases is, there-

[5] These approaches cannot be discussed here, for reasons of space, but cf. Struckmeier (2014b) for a more comprehensive discussion.

fore, quite real. Note, first of all, that some established proposals simply do not cater to these markedness differences. Hinterhölzl, e.g. assumes that a pronominal head cascade in the left middle field can host various types of scrambled DP arguments in their specifier positions (2006; 2013). However, since no restrictions are mentioned as to the order in which DPs merge in these specifiers, the unmarked order is not given any special status. However, more finely elaborated cartographic cascades that indeed cover every conceivable eventuality would still be unable to handle the full range of empirical facts:

- Allowing only those target positions that replicate the base order in left middle field leaves the more *marked* orders unexplained,
- but adding *additional* landing sites to accommodate for *marked* orders takes away the explanation for the preference for 'parallel scrambling' in the *un*-marked case![6]

Note furthermore that the whole model has a central (and we would argue, fatal) design flaw even if a cascade of a dozen or more target positions is deemed acceptable. By the very definition of feature-driven movements, failure to move the attracted category should result in ungrammatical structures. However, the optionality that scrambling exhibits in all known cases (cf. Haider & Rosengren 1998; Fanselow 2003; Grewendorf 2005; Sabel 2005; Putnam 2007, amongst countless others) renders even the most bloated cascade of projections empirically untenable. Fanselow reports on acceptability judgments gathered from his informants as follows: "The small size of the acceptability difference [between scrambling and in-situ cases, V.S.] militates against the view that [this difference, V.S.] is caused by the failure of carrying out an obligatory movement operation" (2006: 154). Compare, for example, the following examples:

(10) Let me tell you something about the cake:
  a) Gestern hat Peter [$_{\text{Top}}$[den Kuchen]$_{\text{Top}}$ wohl [vP den KINDern gegeben]]
  yesterday has Peter.NOM the cake.ACC particle the children.DAT given
  'Yesterday, Peter has given the cake to the children, obviously.'

  b) Gestern hat Peter [$_{\text{Top}}$ _wohl [vP den KINDern [den Kuchen]$_{\text{Top}}$ gegeben]]
  c) [T Peter has not [vP ~~Peter~~ given me my cake today]]
  d) *[T ___ has not [vP Peter given me my cake today]]

The word orders in (10a) and (10b) are acceptable to most speakers, in the indicated context. For some speakers, small acceptability differences exist to the effect that (10a) is slightly preferred over (10b). However, I assume one would be hard-pressed to find competent speakers of English who would agree to a description of (10c) as 'slightly preferred' over (10d). Rather, (10d) is not a possible sentence of English in the first place. Note, for example, that (10d) is not fully interpretable: Is it supposed to be a question or statement? Can we be sure that Peter did not hand over the cake, or did he? No comparable difficulties arise for (10b). Even speakers who prefer (10a) over (10b) do not report any difficulties in interpreting (10b).[7] We conclude, therefore, that the mapping from form

[6] One anonymous reviewer suggests that minimality assumptions could represent parallel scrambling, but I disagree with this assumption: If scrambled elements are taken to be identical in features, minimality would derive an inverted order through nested movements. If scrambled elements differ in features, or are equidistant from attracting heads, no predictions follow from minimality. Furthermore, syntactic assumptions along these lines fail to represent that parallel movement is a preference, not a requirement. Note, additionally, that minimality assumptions are typically rejected for German scrambling movements in any event, cf. e.g., Hinterhölzl (2006; 2013) for discussions.

[7] Note that Frey (2004) offers other defining criteria for his proposed topic movement. In most relevant examples, however, I cannot agree with the empirical judgements Frey bases his proposal on. Therefore,

to interpretation which is the hallmark of converging derivations is met for (10b), but certainly not for (10d). Right from the start, therefore, feature-driven movements yield empirical results that are much too harsh. The very definition of an obligatory operation can potentially apply to obligatory English subject movements as in (10c/d), but not to optional scrambling movements, like the one in (10a/b). To give up this basic requirement seems to us to give up theoretical predictiveness altogether.[8]

Note, additionally, that the very logic of positing target positions in the middle field, cannot even come close to representing what is inarguably relevant for the interpretation of multiple QPs. These scope-sensitive elements are interpreted by inspecting their order *relative to each other*. Thus, it is mostly irrelevant which *absolute* position they occupy: If QP_1, in *any* position, comes to c-command a QP_2 which is in *any* structurally lower position in the middle of a clause, this is standardly taken to express the semantic fact that QP_1 outscopes QP_2 (cf., e.g., Frey 1993 and subsequent literature on scope transparency). Thus, no cascade of functional projection seems adequate to express the relevant constellations between QP_1 and QP_2, which are purely *relational*, as predicted by our approach.

We conclude, therefore, that even the most baroque (i.e., most openly circular) cascade of target positions, along with the most elaborate implementation of obligatory *FF* movements is unsatisfactory as even only an empirical representation of the observable range of (dis-) preferred word orders.

3.2 Problems of feature-driven approaches with asemantic scrambling

As section 2.2 has demonstrated, central instances of scrambling (for example, the movement of definite full DPs across each other) fail to correlate with interpretative differences between the scrambled and unscrambled word orders. This, of course, is quite a damning state of affairs for feature-driven approaches. The absence of any sentence-level semantic effects in central scrambling cases was the cause, we assume, for their move towards information structural features by the feature-driven approach in the first place.[9]

Note, furthermore, that scrambling approaches that trigger movements by topicality features (e.g. Meinunger 2000; Frey 2004, a.o.) have difficulties to explain why elements that cannot be topics in the first place (e.g. parts of idioms, wh-indefinites), still appear to scramble to the left middle field (cf. Hinterhölzl 2006; Fanselow 2012, respectively). In other words, not even the information-structural 'meaning' contribution of FF-driven movements is really clear in many cases.

Some feature-driven proposals attempt to represent asemantic cases of scrambling by assuming additional, specialized movement operations to cater to these outcomes (*S-scrambling*, cf., e.g., Hinterhölzl 2004; 2006; 2013). With regard to such proposals note two problems:

a) The asemantic nature of the movement is only *assumed* by these analyses, but

these tests simply fail to show up clear distinctions in the data for me and are consequently ignored here.

[8] Note specifically that proposals who try to reign in optionality often run into to directly related problems with semantic transparency: E.g., Hinterhölzl (2013) proposes to allow movements of arguments to remain unreflected in the spellout: Whereas a structurally high copy of a moved element is interpreted semantically, post-syntactic operations spell out the structurally low (base) copy of the moved element. This is a very problematic assumptions, since it would lead us to expect that semantic transparency could be compromised: In-situ word orders should now lead to ex-situ semantic effects! This is unattested for most semantic effects, cf. Frey (1993); Bobaljik (2002); Bobaljik & Wurmbrand (2012). To rule out unwanted side-effects of this kind, various restrictions need to be formulated, complicating the (only) seemingly simple spellout solution. I therefore assume that the analysis proposed here is simpler, in that only deviations from semantic transparency are predicted for which empirical evidence can be adduced.

[9] See Struckmeier (2014b) for a critique of the very definition of information structural categories – some of which seem to amount to little more than scrambling trigger features with no clear discourse definitions.

cannot be derived from basic assumptions. In the proposal we outline below, on the contrary, structural *configurations* will predict (im-) possible semantic relations, and without any further assumptions.

b) The integration of the asemantic movement operations with the semantically 'visible' ones is often left open. Hinterhölzl, e.g., seems to predict that scrambling operations which yield marked prosodic outcomes always lead to asemantic movements. This, however, is not completely accurate (cf., e.g., many example of prosodically marked scrambling with ex-situ semantics, in Struckmeier 2014b). To give but one example here, compare the salient semantic interpretations of the two final sentences in (11a) and (11b):

(11) a) If doctors found out that sick patients are more profitable, then they would stop to heal ALL patients. Then, they would NOT heal SOME patients, and then?
Dann würden sie / ALLe Patienten NICHT mehr heilen!
then would they.NOM all patients.ACC not anymore heal
'Then they would not heal any patients anymore' *(salient: ∀¬)*

b) If doctors get paid so little for their work, they will stop caring about their jobs. Maybe they would not give up and quit altogether, however one thing is clear:
Dann würden sie /ALLe Patienten NICHT mehr heilen!
'They would certainly not heal all patients anymore' *(salient: ¬∀)*

In sum, neither semantically transparent nor asemantic cases of scrambling can be represented completely, or explained at all, in cartographic cascades of heads with attracting features.

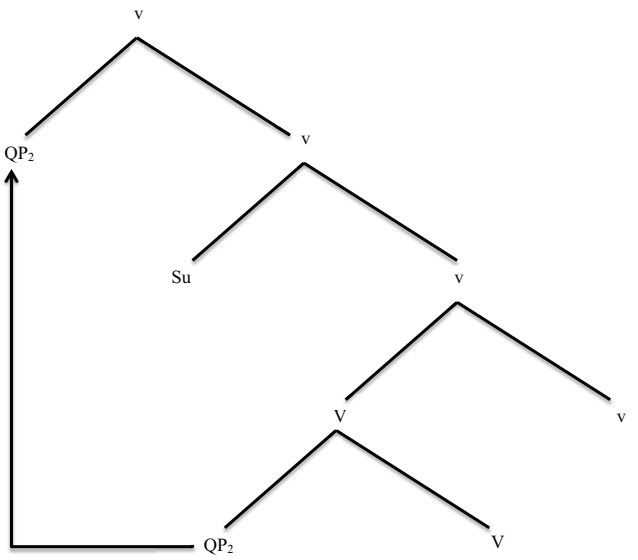
4. An alternative approach: relations, not features

The most deep-seated problem feature-driven approach face is, in my opinion, the compulsory definition of attracting features which have to match attracted/licensed features in the moving category. How does the approach, in its entirety, hope to capture, for example, the scope-driven scrambling outlined in section 2.1? Note that the moved QP does not target a 'high-scope position', nor is a negation element that a scrambled QP scopes over, situated in a designated 'low-scope position'. Rather, every approach we know considers scopal movements as standing outside the logic of *FF* movements, at least in that these movements do not target specific specifier positions within a cascade of functional heads. Similarly, binders move, for some independent reason, to positions from which they (happen to) bind. However there are, under standard assumptions, no designated 'binding heads' which use 'binding features' to attract potential binders (or bindees). Rather, in both the scope and the binding case, the output of syntactic derivations is semantically assessed on the basis of the **output relation** between scope- or binding-relevant elements that the syntax provides to the semantic interface. The causes of movement involved in scrambling, as well as the restrictions on scrambling, should, we argue, be recast in similar terms. In the following, we will outline an approach for the representation of German scrambling on the basis of output relations. Throughout the article, we have seen that some instances of scrambling yield transparent semantic output relations, whereas others apparently lack a semantic motivation. The two cases presented in sections 2.1 and 2.2 will be covered in the following subsections 4.1 and 4.2, respectively.

4.1 Semantically motivated scrambling is semantically licensed internal merge

Under current conceptions, the operation Merge is free. However, in order not to arrive at a completely unrestricted derivation, the outcome of merge operations is assessed by interface systems. For Chomsky, "optional operations can apply only if they have an effect on outcome" (Chomsky 1999: 28). Without such an *EoO*, applications of internal merge are not legitimate (ibid.: 29). Biberauer & Richards make the same point even more succinctly: "Optional rules [...] feed obligatory interpretations; Obligatory rules [...] feed optional interpretations" (2006: 40). In effect, this makes semantically motivated scrambling an expected application of optional internal merge. Whenever scrambling yields new scope interpretations, or new binding options, a semantic effect on outcome is achieved without further ado. We will assume (in accordance with Hinterhölzl 2004) that semantically transparent scrambling need not target a designated target position, or be triggered by an attracting formal feature. Rather, elements that can bind or scope can simply merge internally to the syntactic object already constructed. For a QP_2 merged early to achieve scope over a later-merged QP_1, QP_2 can merge again to the larger object containing QP_1, as in:

(12) a) $[_{vP}$ Su QP_1 QP_2 V v] *(only interpretation: $QP_1 > QP_2$)*
b) $[_{vP}$ QP_2 $[_{vP}$ Su QP_1 QP_2 V v]] *(interpretations: $QP_1 > QP_2$ or $QP_2 > QP_1$)*



Likewise, for binding-relevant elements to avail themselves of new binding options, no designated target positions need to exist. Rather, subsequent merge operations optionally take binders across bindees, yielding the new syntacto-semantic configuration, as in (3).

Note that we explicitly do not advocate a treatment by scope features, as in Hinterhölzl (2006): These features, it seems, are extremely hard to incorporate into a derivation without violating inclusiveness, as Hinterhölzl himself points out. Additionally, every movement step that takes an element that is marked for a certain scope to a new position will invariably also create new c-command relations for this moved element. In his own discussion, Hinterhölzl (2006) generally assumes that Case-marked arguments move to Case-positions outside the VP. However, this of course ultimately places any Case-marked argument (including QPs!) in positions where they come to c-command all arguments contained in VP. Therefore, the semantic interface would have to decide which QP copies will count towards licensing the relevant QPs' scope features (and, incidentally, a QP copy in a Case position (i.e., A-position?) will *not* count, it seems to us). We therefore would

like to avoid all of these (and many related) problems and assume that whatever structural relations a QP finds itself in after all relevant instances of merge have taken place, will define the scope that that QP can take. No stipulations of A and A' positions, or their attracting *FFs* should be introduced to this purpose, if at all possible.

Importantly now, the previous discussion captures only half of the empirical facts, if multiple identical copies of moved elements exist in the syntactic structure. While the semantic reading of a scrambled binder or scope-taking element is represented, something more needs to be said about the phonological visibility of such instances of internal merge. English, famously, does not spell out elements moved for scopal effect in their scope-taking positions, but leaves them in-situ (cf. May 1977; 1985). German, on the other hand, seems to be a good example of a 'scope-transparent' language (cf., e.g., Frey 1993; Hinterhölzl 2004; 2006; Bobaljik & Wurmbrand 2012). Given that an element is interpreted in its internally merged position semantically, it will also not be spelled out in the externally merged position phonologically. In whatever way this connection between the semantic and the phonological interface is implemented precisely, the connection simply must exist. German is, with exceptions to be discussed below, a language that displays scope readings by surface word order. Since German is also a (primarily) right-branching language, wide scope for an element is usually associated with wide scope elements preceding narrow scope elements. Similarly transparent relations hold for binding constellations, with binders typically (but not always, see below) preceding bindees. Whenever binding or scopal transparency holds for constructions, we will therefore call these constructions 'semantically transparent'. For semantically transparent constructions, we need not assume any new technology. Internal merges creates the semantically relevant hierarchical constructions, and semantic transparency guarantees that semantically relevant hierarchical configurations are expressed in that externally merged elements are not spelled out if they are interpreted in internally merged positions. As the next subsection demonstrates, a completely different mechanism is needed to capture scrambling instances without semantic *EoO*.

4.2 Asemantic scrambling is a prosody-driven spellout of a syntactic structure

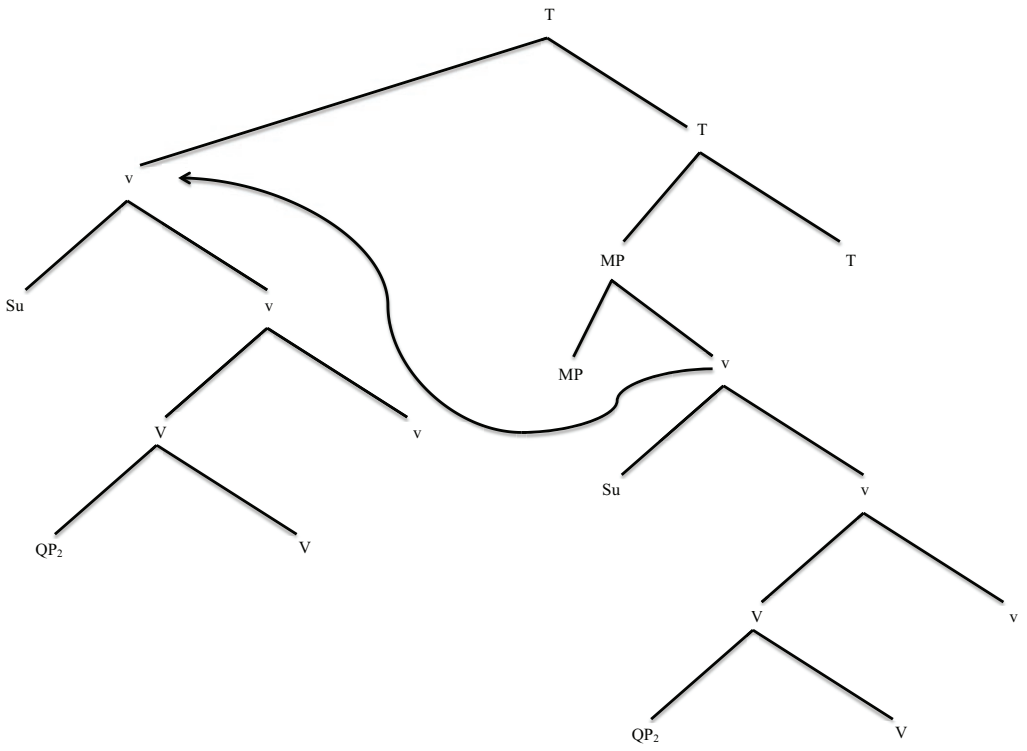
In 3.2, we demonstrated that feature-driven approaches have massive difficulties with scrambling cases that re-order material without apparent interpretative effect. But of course, the merge solution presented for semantically transparent scrambling in Section 4.1. faces the exact same problem for the asemantic cases: Since no semantic *EoO* is achieved that would license optional internal merge, asemantic cases of scrambling cannot be represented as instances of optional internal merge, given current definitions of the duality of semantics. A second mode of structure-building is thus needed for these cases. However, recall that scrambling adheres to syntactic restrictions and even asemantic cases of scrambling cannot be relegated to the phonological component entirely, but will have to comprise a syntactic component. Any solution must be able to represent the following facts about asemantic German scrambling:

- Dislocated elements are interpreted as though they reconstruct into their base positions. Semantically, in other words, these scrambled elements seem not to have moved at all.
- If two or more phrases appear in the left middle field, there is a strong tendency for these phrases to replicate the order that they occupied in the vP. In this way, some features of the base order are again preserved in scrambling outputs, as though there had been no scrambling no begin with.
- However, scrambled elements (as a group, potentially) dislocate vis-a-vis other elements, such as modal particles, negation, etc.

- However, many aspects of the process are by no means universal. We must parametrize the underlying operations in such a way that they occur in German it, but not English, French, etc.

Any analysis should strive to implement its findings on the basis of operations already available in the theory, if possible. In the following, we present a modified version of the approach championed in Struckmeier (2014b) that attempts to stick to syntactically available operations as closely as possible. The absence of any sort of semantic (or syntactic) incentive for the allegedly moved elements is taken seriously in this approach: What if the arguments and adjuncts that appear in the left middle field never did, actually, move individually, and of their own accord? Struckmeier (2014b) assumes that the complete vP, containing all argument and low adjunct phrases, can move to the left middle field. Suppose that some arguments have vacated the vP for semantic reasons, by optional internal merge (13a). Then, suppose some vP-external elements merge (13b). Finally, the complete vP (for reasons explained below) rises to a position above T (13c):[10]

(13) a) $[QP_2\ [_{vP}\ QP_1\ QP_2\ V\ v]]$
b) [[particle $[QP_2\ [_{vP}\ QP_1\ QP_2\ V\ v]]]\ T]$
c) $[[_{vP}\ QP_1\ QP_2\ V\ v]$ [particle $[QP_2\ [_{vP}\ QP_1\ QP_2\ V\ v]]]\ T]$



This syntactically simple assumption fulfills a surprising number of the desiderata outlined above.

Semantically, the elements contained in the moved vP cannot contribute new interpretative options as a matter of course. Note that all elements within vP (QP_1, QP_2, V, v) are simply embedded too deeply inside the vP to bind or scope from their 'new' position – because they are not really in a 'new' position after all: Rather than moving out of their vP position 'on their own', the elements contained in vP have really only been 'shuttled along' when

[10] Non-finite verbs occur in the left middle field, too. Cf. Struckmeier (2014b) for examples of this strange fact.

vP as a whole moved. No semantic *EoO* is expected for the contained elements, neither under the duality of semantics, nor under standard syntacto-semantic assumptions. Should a vP-internal element therefore surface in the middle field in this way, it will still not take a wider scope then it had in its base position. Likewise, no new binding options arise that would not have been available for an argument's base position. Therefore, our analysis provides us with an opportunity to uncouple the linear position of elements from the scope and binding options that we have come to expect in semantically transparent scrambling cases. In sum, elements that spell out in the high vP copy are 'on the left', but still not 'structurally high'. Note that this proposal thus clearly differs from the spellout proposal by Hinterhölzl (2013) pointed out above. In our proposal, the moved category's size explains semantic interpretations without further ado. Rather than parametrizing the alleged target positions in a cascade of projections (as A and/or A' positions), we have parametrized the size of the moved object (individual DPs versus vP). The presence or absence of semantic effects follows without stipulation. Speaker intentions, scope feature assignments, and the requisite checking mechanisms Hinterhölzl proposes thus are unnecessary in our proposal.[11]

At the phonological interface, the proposal also explains some properties without further assumptions. More representation options can be added, some of which we will see below. First of all, note that parallel scrambling is implemented as the default by the vP movement. If two or more elements of vP spell out inside the high vP copy, they will appear in their original vP order as a matter of course; vP cannot be *tampered* with by internal merge, therefore all properties that hold for the lower copy of vP will hold for the higher copy as well. Even if the linearization of the two vP copies should proceed independently, we still do not expect different linearizations to ensue: Since the upper vP copy and the lower vP copy are identical objects, they will linearize identical orders internally. Compare this to feature-driven analyses: Since cascades of functional heads can be stipulated in essentially any desired order, the **identity** (incidentally, a relational notion, itself) of the left and right middle field default orders remain a curious fluke. The movement of vP, on the other, explains the identity of unmarked orders in the left and right middle fields by the conceptually attractive axiom *No Tampering*.

Note that the movement of phrases other than the subject DP to positions above T is not a new technical idea. Rather, many authors have proposed similar movement operations (e.g., Zubizaretta 1998), and Biberauer & Richards (2006) in particular have proposed that vP moves to the specifier of TP in German (albeit for partially different reasons than assumed here).

Note that the 'syntactic' properties of scrambling are also predicted under the analysis proposed here. Since the appearance of elements in the left middle field is brought about by a syntactic movement (albeit of vP), no syntactic anomalies are expected. Also, the clause-bound, middle field-only nature of scrambling follows, as we will see below. Syntactically, we submit, the movement of vP makes very attractive predictions possible.

As far as the phonological interface is concerned, more needs to be said, however. For structures like (13c), a solution is needed to compute the spellout of the contained arguments. Note, however, that 'semantic transparency' is insufficient to predict spellout orders here, since it only requires that the lowest copy of QP_2 not be spelled out:

(14) $[_{vP}\ QP_1\ QP_2\ V\ v]$ [particle $[QP_2\ [_{vP}\ QP_1\ \sout{QP}_2\ V\ v]]$

However, for all other argument copies, semantic transparency is not conclusive. Since the copies contained in the higher vP cannot enter into semantic relations with their copies

[11] Contrary to the criticism of an anonymous reviewer, then, the current proposal shares almost no basic assumptions, or syntactic machinery, with Hinterhölzl's proposals.

copies inside the lower vP, their relative ordering is not restricted by semantic transparency any further than indicated in (14), if no additional assumptions are made. Note also that a simple, English-style spellout rule (to pronounce the entire higher or lower copy of moved phrases by default) is probably not the right solution for German, either. As Fanselow & Cavar (2002) argue convincingly, German is a language that employs *Distributed Deletion* of moved phrases, whenever the criteria that influence the spellout decision for a phrase are conflicting ones: "Suppose that XP bears a feature f1 that requires that XP be overtly realized in position A, and an additional feature f2 that forces XP into position B. Then XP is split up in [...] German" (Fanselow & Cavar 2002: 85). Under this approach, a single phrase moves syntactically, but the mapping to the phonological component distributes phrase-internal material over several linear positions, e.g. in the following example (Fanselow & Cavar 2002: 72):

(15) a) weil ich in /SCHLÖSSern ja in KEINen gewohnt habe
because I.NOM in castles particle in none lived have
'because, as for castles, I haven't lived in any of them.'

Examples of this type present formidable problems for any theory of movement. Note that, for example, the preposition "in" appears twice in the sentence, so that subextraction of "in Schlössern" from the phrase "in keinen Schlössern" is not a workable option. Fanselow & Cavar assume, based on the semantics of the clause, that only one PP "in keinen Schlössern" actually exists structurally, but that the phrase is split up by *Distributed Deletion*, as in:

(16) [In ~~keinen~~ /SCHLÖssern] habe ich noch [in KEINen ~~Schlössern~~]gewohnt.

This instance of *Distributed Deletion* conforms to their definition: The feature f1, [contrastive topic] on "Schlössern", and the feature f2, [focus] on "keinen", make for conflicting spellout requirements of the phrase "in keinen Schlössern". Foci, in German, need to spell out as far on the right as possible (recall Lenerz's 1977 generalization that the scrambling of focus is a marked option), whereas contrastive elements must spell out in a position linearly preceding the main stress associated with the focus. Note that no non-distributed spellout of the PP can ever adhere to both requirements: in its original base order, "Schlössern" follows "keinen" inside the PP "in keinen Schlössern". Therefore, only the distributed spellout can adhere to all prosodic restrictions. *Distributed Deletion* also explains three-way splits:

(17) /BÜCHer durfte man damals intere/SSANTe in den Osten KEINe mitnehmen
books.ACC could one.NOM back-then interesting.ACC to the east none.ACC bring
'Books, specifically the interesting ones, you could not bring to the GDR back then.'

The interpretation clearly involves a DP "keine interessanten Bücher", but the conflicting features contained in that DP cause it to split up (with a concomitant shift in the strong vs. weak execution of the attributive agreement, cf. Fanselow & Cavar 2002; Struckmeier 2007):

(18) [~~keine interessante~~ Bücher$_{CT}$] durfte man damals [~~keine~~ interessante$_{CT}$ ~~Bücher~~] in den Osten
f1 = contrastive topic *f2 = contrastive topic*
[keine$_{Foc}$ ~~interessante Bücher~~] mitnehmen
f3 = focus

Coming back to the question of the spellout of the moved vP in our analysis of German scrambling, note that vP contains a multitude of elements that bring with them a huge set of (often conflicting) linearization requirements. In the simplest case, the vP moves above T, but some vP-internal element is focussed (as is almost always the case) and therefore must not spell out in the left middle field (without good reason, but cf. below). We assume, therefore, that *Distributed Deletion* is available for the spellout of the moved vP.[12] Note, for now, that the apparent 'asemantic movement' of some scrambled phrases is regarded here not as a movement of the phrases in questions, but as a spellout effect, following the obligatory movement of a vP that contained the (allegedly) 'scrambled' phrases. To demonstrate the approach hands-on, the following section will discuss illustrative examples for the interaction of obligatory vP movements and various spellout decisions.

5. On the interplay of syntactic, semantic, and prosodic scrambling factors

Syntactic factors should implement the movement of vP, to capture the syntactic restrictions observed by scrambling movements. Up to this point, we have left open why vP would move syntactically to a position above T in the first place. Whereas, for example, Biberauer & Richards (2006) trigger the movement of vP by a (special) EPP feature on T in languages like German (and Struckmeier (2014b) replicates this move), this feature-driven kind of approach is, of course, not intended here. Rather, we attempt to derive the movement of vP as the result of relational restrictions that must be met by the output of derivations. For semantically transparent scrambling, the semantic interface stated the relevant relational requirements. Given what has been said about the asemantic nature of the movement of vP (and given that vP must move to TP regardless of what the semantics of a clause might be), the semantic interface may not be a promising locus for the statement of the pertinent restrictions. We rather assume here that linear ordering restrictions at the phonological interface are at stake. Following Struckmeier (2014a), we assume that the modal particles we have used as 'boundary stones' between the left and right middle field above, are actually functional heads in the middle of the German middle field. While we cannot replicate the full argument from Struckmeier (2014a) here, we can sketch out why modal particles are considered as low spellouts of C properties here:

- Modal particles are sensitive to C properties. The distribution of modal particles across sentence types can be predicted from C's properties alone.
- Modal particles are even obligatory to spell out some sentence types in German (such as optatives, exclamatives, deliberative questions, etc.).
- Modal particles must be considered heads. Unlike adverbial phrases, they cannot front to the prefield of the clause (as any other moveable phrasal constituent will in German V2 structure), and indeed fulfill all of the central empirical criteria for functional heads (cf. Bayer 2010a; Bayer & Obenauer 2011; Struckmeier 2014a).

We therefore assume here that MPs are C-type functional heads in the German middle field.[13] If, however, MPs are a part of the "verbal" spine of the clause, this leads to a conflict with the Final-over-Final constraint (FOFC, cf. Biberauer et al 2010a; 2010b; Biberauer & Sheehan 2010). This constraints states that head-final projections cannot

[12] For reasons of space, we must refer the reader to Struckmeier (2014b) for the full technical argument.

[13] Note, however, that these elements must be carefully distinguished from focus particles. Despite the fact that modal particles typically both precede and c-command focus exponents (as pointed out by an anonymous reviewer), I assume that they have nothing whatsoever to do with the assignment or licensing of F-markings at all: F-markings are purely a discourse matter, I assume, following Schwarzschild (1999) and Büring (2001; 2006), amongst others.

embed head-initial projections, at least within the same extended projection (such as the extended projection VP-vP-MP-TP-CP assumed here). Perhaps surprisingly, this constraint captures a surprisingly large number of word order generalizations across languages and exceptions seem rare indeed (but cf. Paul 2014, for an interesting candidate). Note now that German modal particles violate the FOFC. The head-final T head in German embeds a head-initial modal particle structure in structures like (13c), repeated here:

(19) $[\ [_{vP}\ QP_1\ QP_2\ V\ v]$ [particle $[QP_2\ [_{vP}\ QP_1\ QP_2\ V\ v]]]\ T]$

While various solutions to this problem could, of course, be conceived, a simple one lies in the movement of vP to a position above T assumed here. Note that the vP becomes a discontinuous object when it moves. The vP object is thus not, technically speaking, linearly following the modal particle (or structurally dominated by it), when it linearizes both before and after the MP (and merges both above and below it). Ipso facto, the syntactic object that merges the MP and the lower vP copy cannot be regarded as "head-initial", waiving the FOFC-violating configuration.[14] Note that this analysis does not crucially depend on the existence of overt modal particles in the clause. The tight interaction of modal particles with C warrants the assumption as "lower spellouts of C". Therefore, in sentences with no overt C, I will simply assume that the element present in C moved to its left-peripheral position from the MP position underneath TP. Indeed, the elements that occupy C and MP may really only be spellout fragments which spell out C properties distributively (cf. Struckmeier 2014a).

Whereas Struckmeier (2014b) maintains that the movement of vP is caused by the EPP of T (which "mistakes" the vP for a subject, in effect), the syntactic derivation proposed here is defined by an output relation again. Just as syntacto-semantic relations license the semantically transparent scrambling cases above, syntacto-phonological restrictions capture the relations between vP and MPs that, we assume, underlie the asemantic scrambling cases.[15] As regards syntax, therefore, no underlying mechanism is stipulated by *FFs* anymore. Rather, every syntactic operation is triggered by the need to conform to output relations that have to hold for the spellout to the interfaces. Note that this analysis is empirically attractive in that it captures the clause-bound nature of the asemantic scrambling cases: Spellout ships off the complement of C at some point in the derivation.[16] The FOFC-violating configuration occurs after T merges, but must be resolved before the syntactic object containing T and the MP spells out. The movement of vP is therefore correctly predicted to be "within the clause"; vP ends up above T, but below C.[17]

[14] Note that the linearization of material inside the vP is not at issue here, since the FOFC does not hold across verbal and nominal spines. I.e., a head-final VP can embed a head-initial DP without problems. In the same way, the variable spellout of vP-internal arguments in the PF mapping, as proposed in the analysis, is entirely unaffected by FOFC considerations – which are concerned with the linearization of tree structures, but not with the choice of movement copies for spellout.

[15] At the request of an anonymous reviewer, I would like to add that this proposal is not in any way directly predicted by the results of the FOFC literature I cite. Rather, I propose that FOFC violations be handled en par with other syntactic structure building operations. Moved copies constitute discontinuous objects (cf. e.g. the discussion of anti-symmetry by Moro (2000), as well as the discussion of labelling issues in Chomsky 2013). Given that these objects are not located in any single position, they cannot be made to take effect in any single position: The vP, e.g., both follows and precedes the modal particle, in the given linearization of the tree. Also, vP is not unanimously included in the particle projection – arguably a prerequisite for dominance relations here. I take these formal facts to suffice to waive the FOFC requirement as outlined above.

[16] The timing of spellout is not relevant, but only the internal make-up of the structure that gets spelled out.

[17] Note that the V2 movement of the verb is not affected by this proposal, contrary to the criticism of an anonymous reviewer. First of all, head movement may not be syntactic, as often surmised. Secondly, even if it is, violations of, e.g., the head movement constraint are not necessarily expected here. Firstly, the movement of a verb could proceed from the high copy of vP, if a finite verb is used. This movement would not cross the modal particle position. Any finite auxiliaries could be argued to originate in T directly, again

The last requirement for a cross-linguistically valid syntactic theory must be to represent typological differences between languages. Note, therefore, that languages like English, French, etc. cannot avail themselves of a vP movement operation. Since these languages have no head-initial C-type particles below T, and since T is head-initial in these languages in any event, no conflict with the FOFC can ever arise. It is only the combination of head-initial heads below T together with the verb-final character of the language that cause the FOFC conflict. Our analysis therefore is a congenial match with older observations:

- The occurrence of modal particles can be tied to the existence of a discourse-configurational middle field in a language's sentence structure (Abraham 1991; 1988). Since we take modal particles to be the underlying cause of the movement of vP, the cooccurence of the two phenomena may receive a principled explanation (even though more research is needed cross-linguistically to validate the generality of the argument, as we concede).
- Other works associate (some kinds of) scrambling with OV word order (cf., e.g., Haider 2003). This fact is also tied into the analysis here, but only to a degree. The FOFC-violating constellation instantiated in (TP-) head-final languages with head-initial modal particle heads is held to be responsible for some (but not all) word order phenomena.

With the basic syntactic assumptions in place, we will now point out further empirical properties of the analysis proposed here:

- In 5.1, we revisit the alleged semantic transparency of German scrambling. As we will see, the existence of asemantic word order changes undermines semantic transparency to some degree – under prosodically definable spellout conditions.
- In 5.2, we investigate the potential options (as well as limits) of prosodically defined spellouts. As we will argue, syntax itself remains ignorant of both prosody and information structure.

5.1 Semantic transparency and its limits: internal mergers and asemantic spellouts

As pointed out in Section 4.1, German can express semantic scopes and bound readings transparently in many cases: If a syntactic movement occurs for semantic reasons, these semantic effects will be reflected at the phonological interface. Note however, that the asemantic word order changes we observed may, of course, interfere with semantic transparency. Suppose, for example, that external merge constructs a vP expressing argument structure, as in (20a). Suppose no movement needs to occur for binding reasons, so that the derivation proceeds by externally merging a modal particle as in (20b).[18] Then, T merges and vP internally merges above T (20c):

(20) a) $[_{vP}$ Peter$_{Ag,i}$ [seine Schuhe]$_{Th,i}$ vergessen]
b) [ja $[_{vP}$ Peter$_i$ [seine Schuhe]$_i$ vergessen]]
c) $[[_{vP}$ Peter$_i$ [seine Schuhe]$_i$ vergessen] [ja $[_{vP}$ Peter$_i$ [seine Schuhe]$_i$ vergessen]] hat]

avoiding V2 movement to cross the particle. Additionally, an alternative view of V2 could be to argue for a remnant vP that moves to the initial position of a sentence, cf., e.g. Müller (2003). Last, but not least, verbs and modal particles might constitute scattered spellouts of single element that moves from V, via v, MP and T, to C (Struckmeier 2014a). Given that many solutions seem feasible, and none of them clearly preferable, I will leave the matter aside here.

[18] The MP "ja" encodes, roughly speaking, the speaker expectation that the proposition denoted by vP is expected (known or easily accommodated) information for the hearer.

The question is how this structure will spell out the available argument copies. Note that no semantically driven scrambling has occurred that would have to be represented phonologically under semantic transparency. Let us assume, for the sake of the argument, that an information structural configuration holds where "Peter" serves as the focus, and "seine Schuhe" is a contrastive element (CE, cf. Büring 1997; Krifka 1998; *enter alia*, for different definitions):

(21) [[$_{vP}$ Peter$_{Foc}$ [seine Schuhe]$_{CE}$ ...] [ja [$_{vP}$ Peter$_{Foc}$ [seine Schuhe]$_{CE}$ vergessen]] hat]

Recall now that contrastive rise contours must linearly precede the main stress exponent in a clause. Four spellout scenarios are conceivable for the argument copies, but only one is possible:

22. *[$_{vP}$ Peter$_{Foc}$ [seine Schuhe]$_{CE}$ ...] [ja [$_{vP}$ ~~Peter~~$_{Foc}$ [~~seine Schuhe~~]$_{CE}$ vergessen]]
*[$_{vP}$ Peter$_{Foc}$ [~~seine Schuhe~~]$_{CE}$ ...] [ja [$_{vP}$ ~~Peter~~$_{Foc}$ [seine Schuhe]$_{CE}$ vergessen]]
*[$_{vP}$ ~~Peter~~$_{Foc}$ [~~seine Schuhe~~]$_{CE}$ ...] [ja [$_{vP}$ Peter$_{Foc}$ [seine Schuhe]$_{CE}$ vergessen]]
[$_{vP}$ ~~Peter~~$_{Foc}$ [seine /SCHUHe]$_{CE}$ ...] [ja [$_{vP}$ PETer$_{Foc}$ [~~seine Schuhe~~]$_{CE}$ vergessen]]

Only the last spellout actually fulfills the prosodic requirement. The object argument spells out in the high copy of the vP, and the subject must spell out in the lower vP copy. Therefore, the bound possessor comes to precede its binder. However, crucially, it has not moved "on its own accord". Rather, the linear order reflects only the prosodic requirement that the rise part of a bridge contour must spell out preceding the fall part of the bridge.[19] Thus, prosodically controlled (and semantically ignorant) spellout decisions of this type underlie a crucial limitation of (full) semantic transparency in German: Binders, given semantic transparency, must not be spelled out in positions that are "too low" for their semantic effect to be transparent. However, bound elements can appear in positions linearly preceding (!) binders, if spellout conditions require it – without ever having moved themselves, as we have just seen. Given this configuration, no violation of binding principles ensues, despite appearances that would make us expect the violation. Sentences such as (7) therefore receive an explanation under our analysis.

The same effect also curtails the semantic transparency of scope relations, as in (6). Suppose that a vP is externally merged, representing predicate-argument relations (23a). No scrambling of the all-quantified object occurs, and a modal particle (denoting speaker expectations), and a negation merge externally (23b). The finite verbs moves to T, and vP moves to a position higher than T (23c):

[19] An anonymous reviewer criticizes that no 'fixed' prosodic contours should be assumed. This is a misunderstanding: I only claim that the more basic prosodic contours which we can call fall and rise in this paper (for ease of description, without any theoretical claims) can only occur in the order rise > fall, but not fall > rise, in declarative clauses in German, since declarative sentence types are partially marked by falling final contours. Note also that the contours that are involved here at not to be mistaken for the computation of prosodic phrasing. Rather, what is at stake here are rise and fall contours that are related to discourse-level markings: Rise contours, e.g., are only referred to infofar as they relate to the cited literature on contrastive elements (Büring 1997; Krifka 1998, etc.). Fall contours are only considered with regard to the prosodic exponence of F-marking (in the sense of, e.g., Schwarzschild 1999; Büring 2001; 2006). Note, importantly, that the rise contour I discuss should not be confused with interrogative rises, and that all the example sentences I discuss concern assertive clause types only. The interrelation between the contrastive and focus prosodic markings and, e.g., sentence-type related prosody is extremely interesting, but not discussed here in any way. Since question-related prosody may operate somewhat differently from the prosodic markers discussed here, counter examples to my findings should involve assertive contexts, too. In sum, the contours I discuss here are, to an appreciable degree, independent from both syntactic as well as sentence-level semantic concerns. For this reason, I would argue that it is futile to attempt a syntactic analysis of the assignment of, e.g., syntactically licensed [contrastive rise] or [focus fall] features – which arguably would have no place in core syntax in any event.

(23) a) [$_{vP}$ der Arzt$_{Agent}$ [alle Patienten]$_{Theme}$ heilt]
b) [ja nicht [$_{vP}$ der Arzt$_{Agent}$ [alle Patienten]$_{Theme}$ heilt]]
c) [[$_{vP}$ der Arzt [alle Patienten]…] [ja nicht [$_{vP}$ der Arzt$_{Agent}$ [alle Patienten]$_{Theme}$ ~~heilt~~] heilt]

Suppose that, similar to the binding case, the object phrase "alle Patienten" is a contrastive element, and the negation element is the sole focus of the clause:

(24) [$_{TP}$ [$_{vP}$ der Arzt [alle Patienten]$_{CT}$…] [ja nicht$_{Foc}$ [$_{vP}$ der Arzt [alle Patienten]$_{CT}$ ~~heilt~~] heilt]]

In this scenario, the object, bearing the contrastive rise, must again come to precede the fall-bearing negation. Given two conceivable spellout positions for the all-quantified object vis-a-vis the negation, only one is acceptable, given prosodic requirements:

(25) a) *[$_{TP}$ [$_{vP}$ … [~~alle Patienten~~]] [ja NICHT$_{Foc}$ [$_{vP}$ … [/ALLe Patienten]$_{CT}$…]] …
b) [$_{TP}$ [$_{vP}$ … [/ALLe Patienten]] [ja NICHT$_{Foc}$ [$_{vP}$ … [~~alle Patienten~~]$_{CT}$ …]] …

Just as with the binding scenario, semantic transparency is thus only respected to a limited degree. Whereas a quantified phrase that moves for scope must spell out in a structurally high position, scope transparency does not seem to check whether prosodically driven re-orderings, such as in (25b), yield surface structures that do not conform to semantic scopes straightforwardly. The all-quantified phrase comes to precede the negation linearly, without taking structural scope over it. To put things differently: Whereas scope transparency sees to it that scopally relevant phrases do not spell out in structural positions that are structurally 'too low' (a syntacto-semantic relation), the system does not (and, maybe, cannot) check whether such an element spells out 'too far on the left' (a syntacto-phonological relation). Sentences such as (6b) are therefore expected in our architecture, too.

With these assumptions, the analysis proposed goes beyond the mismatches between PF and LF structures that previous analyses (cf., e.g. Hinterhölzl 2012) allowed for: Whereas these order proposals established PF mapping optionality only as a means to allow for asemantic, optional word order changes, a different general outlook on form-function mappings is actively supported here. We cannot claim any longer, in the face of the empirical evidence, that the mapping from scrambling word orders to concomitant differences in 'interpretations' is a perfectly 'seamless' and direct one. While the syntax-semantics interface advocated in this paper is indeed a very simple and seamless one, the mapping from syntax to phonological forms is, in part, an 'imperfect' one that introduces mismatches, redundancies, and ambiguities. Imperfections of this kind are clearly attested in the empirical data, as this subsection has demonstrated.

5.2 Prosodic requirements and their limits: Spellout factors and available copies

In the last subsection, we established that prosodic requirements can lead to word order changes that obscure semantic transparency. However, unlike with purely phonological movement operations, the spellout component can only still pick arguments for spellout from the array of argument copies that the syntax has provided to begin with. Secondly, we assume that semantic transparency restricts spellout options further (if not completely, as we have just seen). What, however, happens when prosodic and semantic spellout requirements clash? We have, for example, assumed above that foci are spelled out in the lowest available copy. However, what happens if the rightmost copy is not available for spellout, given semantic transparency? Suppose that the following structure has been merged:

(26) [[alle Patienten]$_{Foc}$ [nicht [$_{vP}$ der Arzt [alle Patienten]$_{Foc}$ heilt]]]

The all-quantified phrase takes scope over the negation, which would need to be reflected in the unavailability of the lower copy of the QP object for spellout under scope transparency. Notice, however, that the object phrase is also the designated focus of the structure. If semantic transparency could be overruled by the prosodic requirement to spell out focus sentence-finally, we would expect focussed phrase to appear in their base position linearly, but with wide scope over negation structurally:

(27) [[~~alle Patienten~~]$_{Foc}$ [nicht [$_{vP}$ der Arzt [ALLe Patienten]$_{Foc}$ heilt]]]

However, this scenario is not empirically attested in German. The resulting word order must be interpreted with narrow scope of the QP, as in (2a), repeated here as (28):

(28) weil der Arzt nicht [ALLe Patienten] heilt. *(…but some, salient reading ¬∀)*

On the contrary, and against the longstanding generalization that foci should not scramble, we can demonstrate that foci scramble with perfect ease if a sentence-level semantic property such as scope must be expressed under scope transparency:

(29) [[ALLe Patienten]$_{Foc}$ [nicht [$_{vP}$ der Arzt [~~alle Patienten~~]$_{Foc}$ heilt]]]

The resulting sentences are judged as fully acceptable (and without prosodically incurred penalty of any kind) in judgement experiments (cf. Brocher & Struckmeier in prep.), as witnessed by (2b), repeated here as (30):

(30) weil der Arzt [ALLe Patienten] **nicht** heilt. *(i.e. none, salient reading: ∀¬)*

It seems, then, that the set of copies that the focus requirement can choose from simply does not include the base order copy ruled out by scope transparency. In keeping with its requirements, the focus requirement picks the lowest argument copy available. This copy happens to be the semantically transparent one in this case. Semantic transparency, we go on to assume, can rule out the spellout of copies that are 'too low'. Therefore, in structures like (30/2b), both the semantic as well as the prosodic requirement are met. Note that no violable constraints seems necessary to achieve this result, given the prosodic and semantic requirements proposed here. In this respect, then, the analysis differs from proposals such as Müller (1999) and Fanselow (2012). While their aims are very close to mine, I attempt to do without both the optimality-theoretic machinery Müller employs, as well as the use of feature-driven (or even prosodically triggered) movements Fanselow proposes. Likewise, I do not need to assume variable base orders, as, e.g. Bayer & Kornfilt (1994) and Fanselow (2001; 2003; 2012), Neeleman & Reinhart (1998) do. In sum, what we arrive at is a *subtractive* grammatical architecture that derives possible word orders and their interpretations:

- Core syntax identifies the set of proper structural objects.
- The semantic interface "subtracts" from the set of possible syntactic structures those structures that fail to meet semantic requirements. In addition to, for example, proper theta configurations, anaphor binding, etc., the semantic interface can license optional internal merge operations with semantic *EoOs*. After applying all necessary semantic checks and mapping operations (most of which have not been discussed in this paper), we arrive at the subset of syntactically possible and semantically interpretable structures.

- The phonological interface licenses cases of internal merge that yield a phonological effect on outcome (e.g. the resolution of the FOFC by the movement of vP over MP and T). Starting from the array of merged copies contained in a licensed syntactic structure, the spellout algorithm then 'subtracts' word order options that are syntactically conceivable and semantically interpretable, but fail to adhere to prosodic requirements (for example, fail to form a proper bridge contour, where required by information structural constellations). We therefore propose that the mapping to the phonological interface will spell out copies of contrastive elements bearing a rise contour in the higher vP copy, should the prosodic need arise.
- In this way, the PF mapping defines a subset of structures that are phonologically well-formed. This is, in a rather non-technical sense, the set of 'possible sentences', in that structures of this kind can be mapped all the way from well-formed phonological matrices onto their semantic interpretations.

One of the word order properties of the middle field we can only allude to here (since it seems appreciably different from the scrambling of full DPs and QPs) is the *Wackernagel* movement of pronouns.[20] Pronouns, it turns out, can sometimes cross full subject DPs even in the left middle field:

(31) weil sich Hans getäuscht hat
since himself Hans deceived has
'since Hans was wrong'

This is unexpected, since the vP containing the full DP subject is taken to be the leftmost element of the middle field. Assume, however, that pronouns can merge to the edge of vP, as in:

(32) [sich [vP Hans sich getäuscht]]

Given that we entertain a notion of relational restrictions on the outcomes of these mergers, how can this (optional) movement be licensed? Note that the vP, once it moves to the specifier of T, for reasons already discussed, brings the pronoun into a position that is linearly adjacent to C:

(33) dass [sich [vP Hans ~~sich~~...]] ja [sich [vP Hans ~~sich~~ getäuscht]] hat

To understand what licenses the merger of *sich*, note that the pronoun cannot attach to MPs:

(34) ??/*dass ja sich Hans geTÄUSCHT hat

Also, a placement preceding the subject becomes impossible for *sich* as soon as another pronoun intervenes between *sich* and C:

(35) Ich glaube, dass *(sich) ihm(*sich) FRITZ gezeigt hat.
I believe that himself.ACC him.DAT Fritz.NOM shown has
'I believe that Fritz showed himself to him' *(intended)*

It seems, then, as though pronouns can only avail themselves of one additional position in the left middle field, right-adjacent to the C head. We will assume here that this fact underlies the explanation for the placement of *sich*: The element cliticizes onto the C head. Why exactly pronouns can avail themselves of this extra placement option is obviously far

[20] I thank one of the anonymous reviewers for bringing up the problem discussed here.

from explained completely. However, since the problem of pronominal movement is not caused (nor exacerbated) by the analysis presented here, we will have to leave the matter to future research.

Resuming our discussion of the spellout architecture presented here, recall that the overall architecture must not only differentiate between possible and impossible structures, but also represents "softer" (dis-) preferences for scrambling movements which the feature-driven approach could not represent. In many cases, the subtractive architecture championed here must therefore leave non-singleton sets of "possible sentences", in order for other factors to define the preferred sentences. Recall sentences of the type in (5), repeated here as (36):

(36) a) weil ich das Geld dem Kellner gegeben habe
b) weil ich dem Kellner das Geld gegeben habe
since I.NOM the waiter.DAT the money.ACC given have
'because I have given the money to the waiter' *(reading for both a and b)*

Given the semantic nature of the arguments employed here, we expect the subtractive system to enter only the most basic linearization requirements. Since definite DPs do not take scopes over each other, and need not be bound, semantic transparency is met if any combination of spelled out objects is chosen:

(37) a) weil [$_{vP}$ ich dem Kellner das Geld...] [$_{vP}$ ~~ich dem Kellner das Geld~~ gegeben] habe
b) weil [$_{vP}$ ich dem Kellner ~~das Geld~~...] [$_{vP}$ ~~ich dem Kellner~~ das Geld gegeben] habe
c) weil [$_{vP}$ ich dem Kellner das Geld...] [$_{vP}$ ~~ich~~ dem Kellner ~~das Geld~~ gegeben] habe
d) weil [$_{vP}$ ich ~~dem Kellner das Geld~~...] [$_{vP}$ ~~ich~~ dem Kellner das Geld gegeben] habe

This extremely liberal treatment by the system may actually be empirically desirable. First of all, note that the scrambling of focus exponents, in most cases, does not lead to harsh deviance, contrary to many such claims in the literature. The original formulation of the restriction by Lenerz (1977), in fact, pointed out that the scrambling of foci is simply more *marked* than the scrambling of non-foci (i.e. requires more special circumstances than permutations of non-foci). Given the right conditions for the scrambling of foci, however, an order permutation that caused focus exponents to occur in non-final positions in a sentence was predicted to be quite possible. The analysis proposed here recaptures this assumption. It is only when the prosodic interface alone can determine spellout positions for focussed argument phrases that the restriction Lenerz actually proposes resurfaces, whereas it has been obscured by syntactic analyses that restricted the syntactic movement of foci categorically. Note that no syntactic operation fails to apply, nor are syntactic restrictions violated by spelling out a focussed phrase in a non-final, derived position. The "soft" nature of the violation incurred, fittingly, supports a placement of the pertinent restriction in a component of the overall grammar that, as a matter of fact, quite often issues "soft" penalties of various kinds, as opposed to the harsh deviance associated with syntactic violations.

Recall also that definite DPs scramble "freely" in German. The set of "possible sentences" therefore must not be unduly restricted: All word orders map onto straightforward semantic interpretations in this case. More generally, we will leave open the set of potential spellout rules for the *Distributed Deletion* of vP. The empirical generalizations that

would be implemented by such rules and restrictions have quite simply not been found. Note, however, that the architecture proposed here:

- regards the availability of syntactically generated copies as a limit for the word order options that spellout rules can implement, and
- offers a natural implementation (without *look-ahead* and similar complexities) for further restrictions (which future research will have to find).

Recall now that speakers can designate certain word orders as preferable over others.[21] Note that the four spellouts in (32) conform to only two word orders linearly. The direct object can precede or follow the indirect object.[22] Both of these orders are acceptable, as (5/31) show. Thus, the system must be able to generate both orders, and assign them both the same interpretation. However, while both orders are possible, one order still may be preferable. Prosodic preferences, for example, are well-known in the literature (cf. Büring 2001; Molnárfi 2002; 2004, amongst many others). In order to demonstrate how the system might prefer orders, let us discuss the effect of discourse givenness on the choice at hand. Suppose that the indirect object is not Given in the sense of Schwarzchild (1999) and Büring (2006), whereas the direct object is. Scrambling the direct object, as in (33a), then renders the focussed indirect object final in its accent domain (AD). Since this conforms to the sentence-final focus already defined by Lenerz as the optimal case, the scrambling of the direct object yields the "perfect AD" (Büring 2001: 91) in (38a). However, the presence of the in-situ dO prevents the sole focus from becoming final in its AD, which leads to the "super-big AD" (ibid: 90) in (38b):

(38) a) ...x)$_{iP}$ b) (x)$_{iP}$
(x) (x)$_{AD}$ (x)$_{AD}$
dO iO$_F$ V iO$_F$ dO V

Recall that both of these sentences are fully interpretable, and native speakers do not consider either one ill-formed in isolation. The prosodic description offered by Büring, we agree, completely suffices to predict the preference some (but not even all) speakers display for scrambling non-foci 'out of the way', in cases like these (cf. also Neeleman & Reinhart 1998; Fanselow 2012 for similar proposals). In the system proposed here, all word orders are acceptable that conform to the set of possible sentences, which can quite often be a rather large set of options. Even for the most minutely specified discourse constellations, semantic interpretations, and prosodic implementations, we are still able (and quite often!) to prefer certain possible sentences over others, because the set of possible sentences oftentimes simply is not a singleton set. Choices within such a non-singleton set can then be made on the basis of 'soft' prosodic preferences, as well as extra-grammatical factors (such as pragmatic or performance preferences, not discussed in this paper). We would like, in closing, to point out that the prosodic factors that we mentioned in this article may not be the only ones that affect German word order. While these factors have clearly been identified in the literature, the grammatical architecture proposed here welcomes additional factors, and would aim to incorporate them in a more elaborate rendition of spellout effects. Should it turn out that these additional factors, once identified,

[21] While pragmatic and performance factors for these preferences can be pointed out (cf. Struckmeier 2014), we will restrict ourselves to prosodic factors here.

[22] The subject is a pronoun here, which makes it likely to spell out in the left vP copy. This is intentional, to reduce the complexity of the example. Recall that any order of arguments in the middle field is often possible, so that even a completely unrestricted spellout (not envisioned here) would not overgenerate word orders.

could not be incorporated in our analysis, findings of that kind would constitute good reasons to rethink the architecture proposed here.

6. Conclusion

Only a couple of decades ago, German middle field word order was considered 'free'. Since every sequence of arguments and adjuncts is possible in principle, no restriction seemed possible or, indeed, required. Within feature-driven approaches, on the other hand, the need for triggering features led to a view of the middle field that considered its word order as deterministically predicted by syntacticized information structural properties. We have proposed here a subtractive architecture that seeks to avoid both extremes. The proposal defines restrictions on the basis of syntactic output relations which all structures must adhere to. Some word orders are not possible at all, some are only possible under certain semantic readings, or prosodic implementations, as we have seen. Additionally, the mapping to the phonology allows us to implement graded (dis-) preferences quite plausibly. True optionality arises for those cases which are equally acceptable and equally preferable, even after **all** pertinent restrictions have been looked after. This is a welcome result. It avails our architecture of a non-singleton set of word order options, which can serve as the input to further, grammar-external systems. Some word orders may not surface much because they cause performance problems (garden-path properties, late immediate constituents, etc.). Others may be ruled out because they are semantically ambiguous, and thus pragmatically dispreferred by cooperative speakers. However, garden-path sentences may be the tool of choice if we actually want to confuse, and ambiguous sentences certainly have their uses, too – if only for uncooperative occasions. Accordingly, even the dispreferred structured should not be ruled out by the grammar entirely (and hence, non-optimal candidates should not be ruled out by an optimality-theoretic kind of grammar).

If (and only if) syntactic, semantic and phonological operations leave open a certain option space for other systems to pick-and-choose from can we arrive at a characterization that can hope to represent the complex word order facts encountered in the German middle field. Not all relevant restrictions seem to be enforced strictly, and many seem not to be "syntactic" or "semantic", in any meaningful sense of these terms. The architecture presented here aims to assign different restrictions to different sub-systems of an overall grammatical architecture. This approach tries capture differences between differences. A "fully grammatical" structure differs from an "ungrammatical" structure in a **different** way than a mildly preferred prosodic implementation differs from a mildly dispreferred, but still perfectly acceptable one. German word order is certainly not completely "free", at the end of the day. However, neither is it reducible to an outmoded, empirically dubious, and explanatorily circular brand of feature-driven syntax.

Abbreviations

AD = accent domain, CE = contrastive element, dO = direct object, EoO = semantic effect on outcome, FF = formal feature, FOC = focus, FOFC = final-over-final constraint, iO = indirect object, OV = object-verb order, Su = subject

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References

Abraham, Werner. 1988. Vorbemerkungen zur Modalpartikelsyntax im Deutschen. *Linguistische Berichte* 118. 443–465.

Abraham, Werner. 1991. Discourse particles in German: how does their illocutionary force come about? In Werner Abraham (ed.), *Discourse Particles: Descriptive and theoretical investigations on the logical, syntactic and pragmatic properties of discourse particles in German*, 203–252. Amsterdam: John Benjamins. DOI: https://doi.org/10.1075/pbns.12.08abr

Abraham, Werner & László Molnárfi. 2001. German clause structure under discourse functional weight: Focus and antifocus. In Werner Abraham & Jan-Wouter Zwart (eds.), *Issues in formal German(ic) typology*, 1–43. Amsterdam and Philadelphia: John Benjamins.

Bayer, Josef. 2010. Discourse particles in questions. In Rajat Mohanty & Mythili Menon (eds.), *Proceedings of GLOW in ASIA VII 2009*, 1–14. Hyderabad: EFL University Press.

Bayer, Josef & Hans-Georg Obenauer. 2011. Discourse particles, clause structure, and question types. *The Linguistic Review* 28. 449–491. DOI: https://doi.org/10.1515/tlir.2011.013

Bayer, Josef & Jaklin Kornfilt. 1994. Against scrambling as an instance of move-α. In Norbert Corver & Henk van Riemsdijk (eds.), *Studies on scrambling: Movement and non-movement approaches to free word order-phenomena*, 17–60. Berlin: Mouton de Gruyter.

Biberauer, Maria Theresa, Anders Holmberg & Ian Gareth Roberts. 2010a. A syntactic universal and its consequences. Download at http://research.ncl.ac.uk/linearization/papers.php. To appear in *Linguistic Inquiry*.

Biberauer, Maria Theresa, Glenda Newton & Michelle Sheehan. 2010b. Impossible changes and impossible borrowings: The Final-over-Final Constraint. Download at http://research.ncl.ac.uk/linearization/people.php. To appear in Anne Breitbarth, Christopher Lucas, Sheila Watts & David Willis (eds.), *Continuity and change in grammars*, 35–60. Amsterdam and Philadelphia: John Benjamins.

Biberauer, Maria Theresa & Marc Richards. 2006. True optionality: when the grammar doesn't mind. In Cedric Boeckx (ed.), *Minimalist essays*, 35–67. Amsterdam, Philadelphia: John Benjamins. DOI: https://doi.org/10.1075/la.91.08bib

Biberauer, Maria Theresa & Michelle Sheehan. 2010. Disharmony, antisymmetry, and the Final-over-Final Constraint. Download at http://research.ncl.ac.uk/linearization/papers.php. To appear in Myriam Uribe-Etxebarria & Vidal Valmala (eds.), *Ways of structure building*.

Bobaljik, Jonathan. 2002. A-chains at the PF-interface: Copies and 'covert' movement. *Natural Language and Linguistic Theory* 20(2). 197–267. DOI: https://doi.org/10.1023/A:1015059006439

Bobaljik, Jonathan & Susi Wurmbrand. 2012. Word order and scope: Transparent interfaces and the 3/4 signature. *Linguistic Inquiry* 43. 371–421. DOI: https://doi.org/10.1162/LING_a_00094

Brocher, Andreas & Volker Struckmeier. *Prosodic, semantic, and information structural factors for German scrambling: Experimental results*. Ms. University of Cologne, in prep.

Büring, Daniel. 1997. *The meaning of topic and focus: the 59th Street bridge accent*. London: Routledge. DOI: https://doi.org/10.4324/9780203448014

Büring, Daniel. 2001. Let's phrase it: Focus, word order, and prosodic phrasing in German double object constructions. In Gereon Müller & Wolfgang Sternefeld (eds.), *Competition in Syntax*, 68–105. Berlin, New York: Mouton de Gruyter.

Büring, Daniel 2006. Intonation und Informationsstruktur. In Hardarik Blühdorn, Eva Breindl & Ulrich H. Waßner (eds.),*Text — Verstehen: Grammatik und darüber hinaus*, 144–163. Berlin, New York: Walter de Gruyter.

Chomsky, Noam. 1999. Derivation by Phase. *MIT Occasional Papers in Linguistics* 18. 1–42.

Chomsky, Noam. 2013. Problems of Projection. *Lingua* 130. 33–49. DOI: https://doi.org/10.1016/j.lingua.2012.12.003

Diesing, Molly. 1992. *Indefinites*. Cambridge, MA: MIT Press.

Fanselow, Gisbert. 2001. Features, Theta-Roles, and Free Constituent Order. *Linguistic Inquiry* 32. 405–437. DOI: https://doi.org/10.1162/002438901750372513

Fanselow, Gisbert. 2003. Free Constituent Order: A minimalist interface account. In Werner Abraham & László Molnárfi (eds.), *Optionality in syntax and discourse structure: Aspects of word order variation in (West) Germanic and other languages*, 191–231 (Folia Linguistica 37/1–2). Berlin : Mouton de Gruyter. DOI: https://doi.org/10.1515/flin.2003.37.1–2.191

Fanselow, Gisbert. 2006. On Pure Syntax (uncontaminated by information structure). In Patrick Brandt & Eric Fuß (eds.), *Form, structure, and grammar: A Festschrift to Günther Grewendorf on occasion of his 60th birthday*, 137–157. Berlin: Akademie Verlag.

Fanselow, Gisbert & Damir Çavar. 2002. Distributed deletion. In Artemis Alexiadou (ed.), *Theoretical approaches to universals*, 65–107. Amsterdam, PA: John Benjamins. DOI: https://doi.org/10.1075/la.49.05fan

Frey, Werner. 1993. *Syntaktische Bedingungen für die semantische Interpretation*. Berlin: Akademieverlag.

Frey, Werner. 2004. A medial topic position for German. *Linguistische Berichte* 198. 153–190.

Frey, Werner & Karen Pittner. 1998. Zur Positionierung der Adverbiale im deutschen Mittelfeld. *Linguistische Berichte* 176. 489–534.

Grewendorf, Günther. 2005. The discourse configurationality of scrambling. In Joachim Sabel & Mamoru Saito (eds.),*The free word order phenomenon: Its syntactic sources and diversity*, 75–135. Berlin, New York: Mouton de Gruyter.

Haider, Hubert. 2003. Scrambling: Nontriggered chain formation in OV languages. *Journal of Germanic Linguistics* 15(3). 203–267. DOI: https://doi.org/10.1017/S1470542703000291

Haider, Hubert & Inger Rosengren. 1998. Scrambling. *Sprache & Pragmatik* 49. 1–104.

Hinterhölzl, Roland. 2004. Scrambling, optionality and non-lexical triggers. In Anne Breitbarth & Henk van Riemsdijk (eds.), *Triggers*, 173–203. Berlin: Mouton de Gruyter. DOI: https://doi.org/10.1515/9783110197433.173

Hinterhölzl, Roland. 2006. *Scrambling, remnant movement, and restructuring in West Germanic*. Oxford: Oxford University Press. DOI: https://doi.org/10.1093/acprof:oso/9780195308211.001.0001

Hinterhölzl, Roland. 2012. Some notes on scrambling and object shift. In Johan Brandler, David Hakansson, Stefan Huber & Eva Klingvall (eds.), *Discourse and grammar: A Festschrift in honour of Valeria Molnar*, 305–321. Lund: Lund University.

Hinterhölzl, Roland. 2013. Economy conditions and coreference: From minimal pronouns to referential acts. *Working Papers in Scandinavian Syntax* 91. 1–35.

Jacobs, Joachim. 1996. Bemerkungen zur I-Topikalisierung. *Sprache & Pragmatik* 41. 1–48.

Jacobs, Joachim. 1997. I-Topikalisierung. *Linguistische Berichte* 168. 91–133.

Krifka, Manfred. 1998. Scope inversion under the Rise-Fall Contour in German. *Linguistic Inquiry* 29. 75–112. DOI: https://doi.org/10.1162/002438998553662

Lenerz, Jürgen. 1977. *Zur Abfolge nominaler Satzglieder im Deutschen*. Tübingen: Gunter Narr.

Lenerz, Jürgen. 2001. Scrambling and reference in German. In Werner Abraham & Jan-Wouter Zwart (eds.), *Issues in formal German(ic) typology*, 179–192. Amsterdam, Philadelphia: John Benjamins.

May, Robert. 1977. *The grammar of quantification*. Cambridge, MA: MIT dissertation.
May, Robert. 1985. *Logical Form*. Cambridge, MA: MIT Press.
Meinunger, André. 2000. *Syntactic aspects of topic and comment*. Amsterdam, PA: John Benjamins. DOI: https://doi.org/10.1075/la.38
Molnárfi, László. 2002. Focus and antifocus in modern Afrikaans and West Germanic. *Linguistics* 40. 1107–1160. DOI: https://doi.org/10.1515/ling.2002.042
Molnárfi, László. 2004. On scrambling as defocusing in German and West Germanic. In Anne Breitbarth & Henk van Riemsdijk (eds.), *Triggers*, 231–386. Berlin: Mouton de Gruyter. DOI: https://doi.org/10.1515/9783110197433.331
Moro, Andrea. 2000. *Dynamic Antisymmetry*. Cambridge, MA: MIT Press.
Müller, Gereon. 2001. Order preservation, parallel movement, and the emergence of the unmarked. In Géraldine Legendre, Jane Grimshaw & Sten Vikner (eds.), *Optimality-theoretic syntax*, 279–313. Cambridge, MA: MIT Press.
Müller, Gereon. 2003. Verb-Second as vP-First. In Anoop Mahajan (ed.), *Syntax at sunset 3. Head movement and syntactic theory*, 116–160 (UCLA/Potsdam Working Papers in Linguistics 10). Los Angeles: UCLA Dept. of Linguistics.
Neeleman, Ad & Hans van de Koot. 2008. Dutch scrambling and the nature of discourse templates. *Journal of Comparative German Linguistics* 11. 137–189. DOI: https://doi.org/10.1007/s10828-008-9018-0
Neeleman, Ad & Tanya Reinhart. 1998. Scrambling and the PF Interface. In Miriam Butt & Wilhelm Geuder (eds.), *The projection of arguments: Lexical and compositional factors*, 309–353. Stanford: CSLI Publications.
Paul, Waltraud. 2014. Why particles are not particular: Sentence-final particles in Chinese as heads of a split CP. *Studia Linguistica* 68. 77–115. DOI: https://doi.org/10.1111/stul.12020
Putnam, Michael T. 2007. *Scrambling and the survive principle*. Amsterdam, PA: John Benjamins. DOI: https://doi.org/10.1075/la.115
Sabel, Joachim. 2005. String-vacuous scrambling and the effect on output condition. In Joachim Sabel & Mamoru Saito (eds.), *The free word order phenomenon: Its syntactic sources and diversity*, 281–333. Berlin, New York: Mouton de Gruyter.
Schwarzschild, Roger. 1999. GIVENness, AvoidF and other constraints on the placement of accent. *Natural Language Semantics* 7. 141–177. DOI: https://doi.org/10.1023/A:1008370902407
Struckmeier 2014a. *Ja doch wohl* C? Modal Particles in German as C-related elements. *Studia Linguistica* 68. 16–48.
Struckmeier, Volker. 2007. *Attribute im Deutschen: Zu ihren Eigenschaften und ihrer Position im grammatischen System* (Studia Linguistica 65). Berlin: Akademie Verlag. DOI: https://doi.org/10.1524/9783050086552
Struckmeier, Volker. 2014b. *Syntax und Prosodie von Scrambling-Bewegungen im Deutschen: Zur komplexen Architektur grammatischer Beschreibungen* (Studia Grammatica 77). Berlin: Akademie Verlag.
Zubizaretta, Maria Luisa. 1998. *Prosody, focus, and word order*. Cambridge, MA: MIT Press.

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