

To flip or not to flip: On the nature of irregularities in the German verbal complex

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A well-known empirical challenge for the analysis of the German verbal complex is the word order effect known as *Oberfeld* phenomenon (Bech, 1955) or Aux-Flip (Hinrichs and Nakazawa, 1989, 1994). In addition to the regular word order shown in (1a), in which every verbal head follows its complement, there is a second word order possibility illustrated in (1b), where the verb *wird* is placed in the so-called *Oberfeld* preceding the verbal cluster.

- (1) a. daß er das Examen bestehen³(1) können²(1) **wird**¹(0)
that he the exam succeed be.able will
'that he will be able to succeed in the exam'
- b. daß er das Examen **wird**¹(0) bestehen³(1) können²(1)
that he the exam will succeed be.able

Here and throughout, the upper-field verb is shown in bold face and each verb bears two annotations to facilitate understanding of the essential part of the example. A verb with the index n selects the verb with the index $n + 1$.¹ The number in parenthesis represents the verb form or *status*² of a verb: 0 is the finite form, 1 the bare infinitive, 2 the *zu*-infinitive, and 3 the past participle.

The following assumptions about the phenomenon are incorporated into the analysis of the verbal complex of Hinrichs and Nakazawa (1989, 1994) and, as far as we are aware, in all subsequent HPSG work dealing with the phenomenon:

1. The *Oberfeld* (henceforth: *upper-field*, with *lower-field* referring to the rest of the verbal complex) phenomenon is nothing but a linearization effect. This assumption is the origin of the name Aux-Flip by which Hinrichs and Nakazawa (1989, 1994) refer to the phenomenon: the auxiliary is flipped from the right to the left side by linearizing it as left instead of as right daughter in a binary verbal complex structure.
2. The class of verbs which can occur in the upper-field has to be stipulated. The class is generally taken to include *werden* (future auxiliary), *haben* (perfect auxiliary), and, less preferred in current German, certain modal verbs.

¹When only the relative rank is of relevance, we will use primes and understand a V'' as being selected by a V'.

²We follow Bech (1955) in using the term *status* and speak of *status government*, in parallel to the terms *case* and *case government* in the nominal domain.

3. The empirical fact that only finite and bare infinitival, but not past participle or *zu*-infinitival forms can occur in the upper-field has to be stipulated.
4. The class of verbs which can occur as the verbal complement of a verb in the upper-field has to be stipulated. The class mainly includes verbs which take a bare infinitival complement, but some verbs selecting a *zu*-infinitive as well as certain verbs not subcategorizing for a verbal complement are also possible.
5. It is an empirical fact that every verb in a verbal complex which selects a verb in the upper-field also has to be in the upper-field (and not in the lower-field). To capture this one has to stipulate that the verb *haben* passes on the “flip requirement” it had to satisfy to any verb selecting it.
6. One has to stipulate the empirical fact that a form of the perfect auxiliary *haben* in the upper-field requires its verbal complement to occur in the form of a bare infinitival instead of the expected past participle form.
 - (a) Special past participle lexical entries have to be assumed for the class of verbs which despite being selected as past participles occur in bare infinitival form. One has to stipulate that each of these special past participle entries happens to have exactly the same morphology as the bare infinitival form.
 - (b) The class of verbs for which this is the case can be divided into two subclasses: Those which only have the substitute infinitival form for their past participle, and those which have both the regular and the substitute infinitival form for their past participle.
 - i. Membership in the former subclass has to be stipulated and mainly includes the modal verbs.
 - ii. Membership in the latter subclass also cannot be deduced and consists of verbs generally selecting a bare infinitival complement such as AcI verbs like *lassen (let)* or control-verbs like *helfen (help)*.
 - (c) The occurrence of the substitute infinitival forms has to be restricted to the construction where they are selected by the perfect auxiliary *haben* in the upper-field. This is so since in all other cases where a past participle is selected, the morphological realization has to be a past participle and not the substitute infinitival form.
 - (d) The entries for the regular past-participle form of all German verbs have to be marked as not being selectable by *haben* in the upper-field.

Looking over these assumptions, it is important to stress the fact that the stipulation of facts which truly cannot be deduced from independently motivated properties is an essential ingredient of an empirically adequate theory. By acknowledging that membership in the verb classes described in the assumptions 4. and 6.b.i. cannot be deduced from independent properties of the entries or of the construction they occur in, Hinrichs and Nakazawa (1989, 1994) leave most of the generative literature behind in making the empirically correct assumption that the possibility of an upper-field cannot be deduced from the occurrence of two bare infinitives in the verbal complex. The commonly found reference to the upper-field phenomenon by the name of Double-Infinitive

Construction (DIC) thus is a misnomer. On the other hand, one obviously would not want to make stipulations for anything which can be deduced from other properties without sacrificing the empirical adequacy of the analysis.

In this paper, we want to challenge the assumption that the nature of the upper-field phenomenon is that of an irreducible cluster of idiosyncracies surrounding an exceptional word order possibility. With respect to the above list of assumptions underlying previous work in HPSG, this means that we challenge claim 1 stating that the upper-field phenomenon is nothing but a linearization effect. We will show that there are two lesser known sets of data which make this original Aux-Flip linearization idea untenable. We instead propose that the verbs in the upper-field are exceptional in a “deeper” sense, in that they do not construct as ordinary verbal heads. In fact, it will become clear that they essentially share no observable properties with ordinary verbal heads in head-complement constructions. Instead we will argue that they behave more like functional elements as characterized by Abney (1987). On the basis of such a revised syntactic setup, one can eliminate all assumptions listed under 6 (except for 6.b.i). The unexpected word order and verb form irregularities, which under the traditional view have to be independently stipulated, resurface as related regular properties based on the proposed assumption of a different syntactic role of verbs in the upper-field.

1 Empirical problems for an Aux-Flip account

There are three empirical issues which are beyond the scope of the Aux-Flip account of Hinrichs and Nakazawa (1989, 1994). We first discuss an alternative linearization for verbs that can occur in the upper-field. Second, we provide empirical evidence against the way the empirical fact has been dealt with that every verb in a verbal complex which selects a verb in the upper-field also has to be in the upper-field (item 5 in the list above). Finally, we turn to a second kind of substitute verb form occurring in place of a selected past-participle, a substitute *zu*-infinitive.

1.1 Alternative linearizations of the upper-field

In addition to the upper-field word order we saw in (1b), there is a less common alternative linearization discussed as *Zwischenstellung* by Meurers (1994) in which the upper-field verb is placed in-between the other verbs of the verbal complex as illustrated by (2).

- (2) daß er das Examen bestehen³(1) **wird**¹(0) können²(1)
 that he the exam succeed will be.able
 ‘that he will be able to succeed in the exam’

The more natural corpus examples in (3) show that any position in the verbal complex to the left of the rightmost verb is a possible location for the “upper-field”-verb.

- (3) a. Zu dem Zeitpunkt, an dem ich mich entscheiden³(1) **hätte**¹(0) müssen²(1₃), war das
 at the time at which I me decide had-SM have was the
 Gesangsbuch wichtiger.
 hymn.book more.important
 ‘At the time at which I would have had to decide, the hymn book was more important to me.’
- b. laut der der Landeszuschuß nicht bei den Betriebskosten berücksichtigt⁴(3)
 according to.which the subsidy not for the operating.costs considered
hätte¹(0) werden³(1) sollen²(1₃)
 have be should
 ‘according to which the subsidy should not have been considered for the operating costs’
- c. die laut Erschließungsbeitragssatzung zu 90 Prozent auf die Anwohner
 which according.to statutes to 90 percent on the neighbors
 umgelegt⁴(3) werden³(1) **hätten**¹(0) müssen³(1₃)
 apportioned be have have
 ‘90 percent of which should have been apportioned on the neighbors according to the statutes’

Apart from the linearization as such, the *Zwischenstellung* (henceforth: *lower-field split*) phenomenon appears to share the properties of the ordinary upper-field cases, so that it makes sense to view the lower-field split as an alternative linearization of the upper-field.

The linearization of the upper-field verb in these examples clearly cannot be obtained as the result of flipping the auxiliary to the other side of the verbal complex in a binary branching structure. The original use of the upper-field phenomenon by Hinrichs and Nakazawa (1989, 1994) as an argument for a left-branching binary verbal complex structure thus cannot be entertained in light of the lower-field split data. The only alternative to abandoning a pure linearization approach to the upper-field phenomenon at this point is to introduce larger word order domains in which the upper-field verb can be linearized, such as the linearization-based HPSG proposals by Kathol (1995) and S. Müller (1999), or the approach of Bouma and van Noord (1998) assuming a completely flat verbal domain.

1.2 Multiple words in the upper-field

The generalization expressed by Hinrichs and Nakazawa (1994) to license (4b) but exclude sentences like (4c) is that *haben* as selected verb (V'') always has to occur in the same field, i.e., upper-field or lower-field, as the verb selecting it (V'). This part of their theory of upper-field formation is also incorporated by Kathol (1995, pp. 222ff) and St. Müller (1999, sec. 14.2.1), so there is no alternative HPSG proposal to these data we are aware of.

- (4) a. daß er sie die Lieder singen⁴(1) gehört³(3) haben²(1) wird¹(0)
 that he her the songs sing hear have will
 ‘that he will have heard her sing the songs’
- b. daß er sie die Lieder **wird**¹(0) **haben**²(1) singen⁴(1) hören³(1₃)
 that he her the songs will have sing hear

- c. * daß er sie die Lieder **haben**²⁽¹⁾ singen⁴⁽¹⁾ hören^{3(1₃)} wird¹⁽⁰⁾
 that he her the songs have sing hear will

The generalization proposed by Hinrichs and Nakazawa (1994) covers the data in (4), but it also has the consequence of excluding sentences like (5).

- (5) ? daß er sie die Lieder **wird**¹⁽⁰⁾ singen⁴⁽¹⁾ gehört³⁽³⁾ haben²⁽¹⁾
 that he her the songs will sing heard have

At closer inspection, constructions in which a *haben* as V” in the lower-field is selected by an upper-field V’ do seem to exist, however. This is illustrated by the following examples from Walser³ and Goethe⁴, whose second example shown in (7b) shows that the other perfect auxiliary *sein* supports an upper-field equally well.

- (6) a. das ihr wahrscheinlich aus dem Munde eines anderen **würde**¹⁽⁰⁾ lächerlich und
 which her probably out.of the mouth of another.one would ridiculous and
 blöde geklungen³⁽³⁾ haben²⁽¹⁾
 stupid sounded have
 ‘which for her probably would have sounded ridiculous and stupid if said by someone else’
- b. Ich interessierte mich bloß, welches Gefühl sie dazu **könnte**¹⁽⁰⁾ veranlaßt³⁽³⁾ haben²⁽¹⁾
 I interested me only which feeling you to.that could motivated have
 ‘I was just interested, which feeling could have motivated you to do it.’
- (7) a. Wie lange wir **mögen**¹⁽⁰⁾ gesessen³⁽³⁾ haben²⁽¹⁾, weiß ich nicht.
 how long we might sit have know I not
 ‘I do not know how long we might have sat there.’
- b. Mancherlei Lustwäldchen [. . .] zeigten, wie angenehm die kleine Residenz ehemals
 various pleasure.forests showed how agreeable the little residence once
müsse¹⁽⁰⁾ gewesen³⁽³⁾ sein²⁽¹⁾.
 must been be
 ‘Various pleasure forests showed how agreeable the little residence once must have been.’

Generally disallowing a V’ in the upper-field whenever a perfect auxiliary occurs as V” in the lower-field thus seems to be incorrect. The standard HPSG analysis of having the perfect auxiliary V” identify the “flip requirement” it imposes on V’ with the “flip requirement” imposed by its complement V” thus is empirically flawed.

The proper generalization seems to be that every verb in a verbal complex which selects a verb in the upper-field also has to be in the upper-field. Essentially, an occurrence of an upper-field seems to close off the lower-field to higher verbs - an observation which suggests that upper-field word order is more than the traditionally assumed shallow word order effect.

³Robert Walser: *Geschwister Tanner*. Zürich: Suhrkamp Taschenbuch Verlag, pp. 73, 13, 66, 101.

⁴Johann Wolfgang von Goethe: *Aus meinem Leben: Dichtung und Wahrheit*. Weimar, Germany: Hermann Böhlau Nachfolger, pp. 417, 443.

1.3 An alternative substitute morphology

The third data set concerns an alternative to the morphological irregularities surrounding the occurrence of a form of *haben* in the upper-field as illustrated by (8).

- (8) daß er sie **hat**¹⁽⁰⁾ singen³⁽¹⁾ hören^{2(1₃)}.
that he her has sing heard
'that he has heard her sing.'

As noted in the introduction, all proposals we are aware of assume that *hören* in such examples is a special substitute-infinitive entry for a past participle which arises whenever the perfect tense auxiliary selects from the upper-field.⁵

Interestingly, a different kind of substitute form for the past participle surfaces in certain environments. This second kind of substitute infinitive, which is not mentioned in published HPSG work, is illustrated in (9) and with more natural real examples in (10).

- (9) Er starb, ohne sich **haben**^{1(1₂)} entschuldigen³⁽¹⁾ zu können^{2(2₃)}
he died without REFL have excuse to be.able
'He died without having been able to excuse himself.'

- (10) a. Ich erinnere¹⁽⁰⁾ mich, einen Reisenden das eigentümliche Entsetzen **haben**^{2(1₂)}
I remember me a traveler the peculiar shock have
schildern⁴⁽¹⁾ zu hören^{3(2₃)}, welches er beim Anblick eines gewaltigen Eichbaumes
describe to hear which he at.the sight of.a huge oak.tree
empfand.
sensed
'I remember having heard a traveler describe the peculiar shock which he sensed at the sight of a huge oak tree.'
- b. Wir rechnen¹⁽⁰⁾ es dem Verfasser zum Verdienst an, nicht mehr **haben**^{2(1₂)}
we value it the author to merit PART not more have
bestimmen⁴⁽¹⁾ zu wollen^{3(2₃)}.
ordained to want
'We are grateful to the author for not having wanted to ordain more.'
- c. Jedes Verbum Comp. scheint¹⁽⁰⁾ die Reduplikation **haben**^{2(1₂)} wegwerfen⁴⁽¹⁾ zu
each verbum compositum seems the reduplication have throw.away to
können^{3(2₃)}.
be.able
'Each verbum compositum seems to have been able to do away with the reduplication.'

There are two status (= verb form) irregularities arising in a sentence like (9): Firstly, the *haben* in the final-field is realized in the first status instead of the second status (*zu*-infinitive) which it

⁵In our annotation of the verb form, we note the selected verb form by a subscript to the number representing the observable verb form.

is assigned. And second, the verb selected by *haben* is realized in second status instead of the third status (past participle) governed by *haben*, i.e., as a substitute *zu*-infinitive. The class of verbs which can be realized in such a substitute *zu*-infinitive form seems to be identical to the class of verbs which can occur as substitute infinitive.

The traditional view of the substitute infinitive at this point would have to assume substitute *zu*-infinitival verb forms in addition to the ordinary substitute infinitive and come up with some explanation of when *haben* selects which of the two substitute forms. With respect to the assumptions we listed in the introductions, this means that the stipulations listed under 6. would have to be doubled. Additionally, it is unclear how one would determine when the perfect auxiliary would select which of the substitute infinitival forms.

2 Upper-field verbs as functional elements

Building on the additional observations discussed in the previous sections, we want to claim that the upper-field phenomenon is not the occurrence of an ordinary verbal head in a head-complement construction surrounded by a collection of idiosyncracies but rather the occurrence of a special verbal element constructing as a functional marker in a marker-head construction surrounded by fully regular elements. To back this up, let us start by showing that the upper-field verb is not just unusual but actually fails to show any of the properties one would expect if the upper-field verb were constructing as ordinary head in that structure.

The **word order** properties of upper-field verbs differ in two respects from ordinary verbs in the verbal complex. Firstly, upper-field verbs occur to the left of their argument instead of the right as ordinary verbal heads, which violates the uniform ordering of heads relative to their complement one would like to assume for head-complement structures in general. And secondly, while ordinary verbal complex verbs follow a strictly uniform word order in their separate topological field, upper-field verbs have substantially more word order freedom in that various upper-field linearizations are available: the ordinary upper-field position, the lower-field split positions, and positions further left of the verbal complex often referred to as verb-projection raising which we for space reasons cannot discuss in this paper.

Regarding **status assignment** there are two relations to consider: the one between a V' and the upper-field verb V'' , and that between the upper-field verb V'' and its verbal complement V''' . Regarding the first relation, there is no empirical evidence showing that the status of an upper-field verb V'' can be governed, be it by a verbal head V' or a complementizer like *um* or *ohne*. Instead, upper-field verbs always show first status in a non-finite construction or verb-second sentence. But if all attempts to govern the status of an upper-field verb fail, it is unclear whether a government relationship between the higher verb and the verb in the upper-field is established at all.⁶

Turning to the second relation, the one between the upper-field verb and its verbal complement, the situation appears to be parallel in that there is no evidence that an upper-field verb can govern the

⁶Finiteness differs from the non-finite status in that the highest upper-field verb shows finite morphology in a finite verb-last sentence. Finiteness thus needs to be dealt with separate from the non-finite status. Formally, we treat finiteness as a marking feature.

status of its verbal complement. In particular, when a form of the perfect auxiliary *haben* occurs in the upper-field, its verbal complement can show up in first (substitute infinitive) or in the less commonly observed second status (substitute *zu*-infinitive) instead of the third status which would be expected.

Summing up, it seems to be impossible to empirically establish that upper-field verbs govern status or are governed status, which makes it interesting to explore how far we can get if we eliminate the government relationships with upper-field verbs altogether by taking the upper-field out of the hypotactic status government chain.

This idea immediately raises the question what the syntactic status of upper-field verbs is supposed to be if they are not to be understood as ordinary heads in a head-complement structure. The answer we want to suggest is that they are functional elements similar to complementizers. In the HPSG architecture of Pollard and Sag (1994) these are formalized as *markers* which do not function as heads but only ‘mark’ few properties of a head projection. All such functional elements share the property that they are linearized to the left of the head-projection they combine with, and they only combine with a single constituent.

While in this paper we have focused on arguing against upper-field verbs as ordinary heads, a positive characterization of upper-field verbs as functional elements also seems to be within reach. Abney (1987, pp. 64f) lists five properties characterizing functional elements, all of which can essentially be argued to apply to upper-field verbs. Firstly, we saw that only a restricted lexical class of elements can occur as upper-field verbs. Secondly, one of the characteristics of upper-field verbs is that they are never stressed (Bech, 1955, pp. 64, 67). Thirdly, upper-field verbs only select a single complement, a verbal projection. And fourthly, the complement of upper-field verbs cannot be topicalized. The fifth criterion is that functional elements lack what Abney (1987, p. 65) calls a “descriptive content”; instead they are “regulating or contributing to the interpretation of their complement”. This criterion requires a detailed discussion of the semantic contribution of upper-field verbs in order to be evaluated, which is beyond the scope of this paper. A related discussion is, however, provided by Van Eynde (1994), who argues on semantic grounds for treating a similar class of verbs as functional elements.

2.1 Licensing upper-field verbs as functional elements

Let us illustrate the idea of removing upper-field verbs from the hypotactic government chain with two examples.

2.1.1 Substitute *zu*-infinitive as regular second status

The example in (11) is a simple instance of a sentence with an upper-field and a substitute *zu*-infinitive.

- (11) um es **haben**^{1(1₂)} schreiben³⁽¹⁾ zu können^{2(2₃)}
 for it have write to be.able
 ‘for to have been able to write it’

2. AS BEFORE: The class of verbs which can occur in the upper-field has to be stipulated.
3. The empirical fact that only finite and bare infinitival, but not past participle or *zu*-infinitival forms can occur in the upper-field is derived from the fact that an upper-field is not a normal head or complement so that no (non-finite) status assignment into the upper-field or out of the upper-field ever takes place. As a result, only a finite and a bare infinitival form of upper-field verbs exists.
4. AS BEFORE: The class of verbs which can occur as the verbal complement of a verb in the upper-field has to be stipulated.
5. As we saw in the discussion, the empirical fact that every verb in a verbal complex which selects a verb in the upper-field also has to be in the upper-field is not appropriately captured by the Aux-Flip analyses. In the alternative analysis we propose, one can capture the data since upper-field verbs are taken to be markers, which close off the verbal projection for further lower-field verbs. Since upper-field verbs are analyzed as syntactically different entities from their lower-field occurrences, this is a reasonable stipulation to make.
6. No stipulation is needed to obtain the empirical fact that a form of the perfect auxiliary *haben* in the upper-field requires its verbal complement to occur in the form of a bare infinitival instead of the expected past participle form. This follows automatically from the fact that upper-field verbs are not part of the head chain so that no status government takes place.
 - (a) No special substitute infinitive or substitute *zu*-infinitives have to be assumed.
 - (b) Neither of the two subclasses for which substitute infinitive entries had to be assumed needs to be stipulated. The verbs in class 6.b.i. are still relevant, but they are simply those verbs which do not have a past participle forms in their paradigm. As a result, they can never be status governed by a perfect tense auxiliary. The only possibility for such participle-less verbs to occur embedded under a perfect auxiliary is when the perfect auxiliary is in the upper-field and therefore not a status governing head.
 - (c) Since there are no special substitute infinitival forms, nothing needs to be done to restrict their occurrence.
 - (d) No marking of regular past-participle forms is necessary since there are no other past-participle forms.

The result of reconsidering the status of upper-field verbs thus is a significant reduction in the number of assumptions needed to license the phenomenon.

4 Summary

The analysis idea presented in this paper is an attempt to question the traditional perspective on the irregular status and word order phenomena in the German verbal complex. We showed that eliminating upper-field verbs from the hypotactic status government chain makes it possible to provide

a completely regular analysis of the problematic status government phenomena. In addition, the resulting analysis also covers three sets of data not accounted for by the traditional Aux-Flip approach.

In this short paper we have focused on the empirical and conceptual arguments for reconsidering how upper-field verbs are licensed. An in-depth empirical discussion and a full HPSG analysis of this phenomenon and other topics in the area of non-finite constituents in German can be found in Meurers (2000).

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