Word Order, Clause Union, and the Formal Machinery of Syntax

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Extended Yet Rough and Sketchy Abstract

1 Introduction

The goal of this paper is to show that German embedded infinitivals form complex predicates at f-structure. Furthermore, this paper claims that there is no identifiable phenomenon at c-structure that corresponds to the traditional notion of "coherence".

The paper deals with two types of embedded infinitivals, the permissive (which is also the causative), and embedded *zu* infinitives. The permissive, formed with *lassen*, takes a bare infinitive complement, while the embedded *zu* infinitives have the particle *zu*.

The paper follows Butt (1995) in her analysis of similar constructions in Urdu/Hindi. The idea that the German constructions are similar to their Urdu counterparts is *a priori* plausible: striking similarities have been found between German and Korean, another verb-final language with word-order freedom (see, e.g., (Rambow and Lee, 1994; Frank et al., 1996)). Furthermore, the contrastive approach is instructive as it brings out both the particularities of the language, and guards against methodological pit falls (such as language-specific assumptions disguised as methodology).

The paper is structured as follows. Section 2 introduces the relevant German data, and briefly outlines what will be called the "traditional" analysis, which goes back to Bech (1955). This analysis assumes some form of clause union. I then briefly present the relevant Urdu data from (Butt, 1995), and summarize Butt's analysis. Section 4 argues that there is no complex predicate in German, i.e., no phenomenon that distinguishes these constructions in German form their English counterpart at f-structure. In Section 5 I argue that there is also no "clause union" phenomenon at c-structure. This argument relies on new data, and on a theoretical argument about the mapping between f- and c-structure. I relate the relation between f- and c-structure in LFG to work in the tree adjoining grammar tradition to show similarities between suggested solutions.

2 The German Data and the "Traditional" Approach

Properties of German embedded infinitivals led Bech (1955) to descriptively identify two classes of constructions, the *coherent* constructions in which all verbal forms are adjacent and in which their verbs' arguments behave as if they were arguments of a single verb, and the *incoherent* constructions, in which the verbs are not (necessarily) adjacent and which displays expected biclausal behavior. Purely descriptively, the

following properties have been noted (this list is based on (von Stechow and Sternefeld, 1988), and is not exhaustive):[1]

- Sentences with extraposed clauses and sentences in which only one verb has been fronted are always incoherent constructions:

  (1) a. daß Hans versucht, das Auto zu reparieren
          that Hand tries   the car   to repair

      that Hans tries to repair the car

      b. Versucht hat Hans das Auto zu reparieren
          tried   has Hand the car   to repair

      Hans has tried to repair the car

      c. Zu reparieren hat Hans das Auto versucht

  Lassen does not permit extraposition, and only marginal partial fronting. Therefore, it is often said that the permissive is obligatorily coherent, while coherence is optional in the case of embedded *zu*-infinitives.

- Fronting of multi-verb sequences without their arguments is possible only in coherent constructions:

  (2) Zu reparieren versucht hat Hans das Auto
        to repair   tried   has Hand the car

      Hans has tried to repair the car

- Long scrambling[2] is possible only in coherent constructions:[3]

  (3) a. daß es Hans zu reparieren versucht
          that it Hans to repair   tries

      that Hans tries to repair it

      b. * daß es Hans repariert zu haben bereut
            that it Hans repair   to have   regrets

      Intended meaning: that Hans regrets having repaired it

  (3b) shows that long scrambling is restricted to certain verbs. We will call verbs that allow for coherent constructions with their complements *coherent* verbs, and those that do not, *incoherent* verbs. (3b) also shows that the juxtaposition of center-embedded infinitivals is not a sufficient condition for coherence. In fact, most authors assume that in the center-embedded construction with *zu* infinitives, coherence is optional even if the matrix verb is a coherent verb.

- Coherent verbs allow for a transposition of the matrix and embedded verbs (the "Third Construction"):

  (4) daß Hans das Auto versucht zu reparieren

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[1]The terms "matrix" and "embedded" are used purely descriptively to refer to the two verbs involved and to their arguments. The use of this terminology does not imply a bias against the traditional analysis.

[2]The term "long scrambling" is used to refer descriptively to cases in which an argument of a verb appears to the left of an argument of a (semantically) less deeply embedded verb. One often finds the claim that German has no long scrambling. This claim is not an empirical claim, but a theoretical claim, since it is based on the clause union analysis. That scrambling is syntactically different from *wh*-movement (a statement occasionally made to show that long scrambling does not exist) is both obvious and irrelevant.

[3]I ignore differences between clitic climbing and scrambling for the sake of the argument in this paper.

- In incoherent constructions, negation in the embedded clause cannot have matrix interpretation, while in coherent constructions, it must.

(5) a. Weil   Hans versucht, das Auto nicht zu reparieren
          because Hans tries   the car   not   to repair

    Only reading: Because Hans is trying not to repair the car

    b. Weil Hans das Auto nicht zu reparieren versucht
        Reading 1: Because Hans is trying not to repair the car
        Reading 2: Because Hans is not trying to repair the car

Note that (5b) has two readings since the string is ambiguous between a coherent and an incoherent construction.

Bech (1955) claims that only subject-control verbs without nominal objects can participate in a coherent construction. Haider (1993) shows that this is not true. For example, in (6) (Haider's 56-b), an object control verb is involved in a coherent construction (as evidenced by the long scrambling of the embedded object).[4]

(6) ? daß ihn   mir   jemand   zu konsultieren geraten   hat
      that him$_{ACC}$ me$_{DAT}$ someone to consult   recommended has

    that someone has recommended to me to consult him

The descriptive distinction between coherent and incoherent constructions is interpreted by Evers (1975) in the formal[5] context of transformational grammar. He proposes that sentences with recursively embedded clauses in Continental West Germanic languages (CWG) differ significantly in their syntactic analysis from their non-center-embedded counterparts in CWG and in other languages such as English and French. In CWG constructions in which verbs are adjacent to each other, he proposes an optional two-pronged process for coherent matrix verbs:

1. Embedded verbs move up to their governing verbs and form a single morphological unit through incorporation ("verb cluster formation"). The argument lists of the two verbs are merged.

2. The process of verb raising dissolves the clause boundary of the embedded clause ("clause pruning").

As a result, the two verbs appear to act as one verb at the surface, and all the arguments appear to be arguments of this complex verb. This approach has been followed by many other researchers in other frameworks as well, though of course analyses differ greatly as they are expressed in the different frameworks, in particular with respect to how and at what level of representation the two verbs combine. This class of approaches is what the term "traditional approach" refers to.

3   Butt (1995) on Complex Predicates in Urdu

Butt (1995) discusses two types of constructions in Urdu/Hindi, the *permissive* shown in (7a), and the *instructive*, shown in (7a).

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[4]The somewhat reduced acceptability can be attributed to the multiple scrambling, and the sentence is clearly better than would be expected if *raten* were coherent.

[5]I leave aside the issue to what extent the transformational theory of the 70s was "formal" – the term is used here to contrast Evers's work with the purely descriptive work of Bech.

(7) a. anjum=ne   saddaf=ko   haar   banaa-ne   di-yaa
       Anjum.F=Erg Saddaf.F=Dat necklace.M=Nom make-Inf.obl give-Perf.M.Sg

       Anjum let Saddaf make a necklace

    b. anjum=ne   saddaf=ko   haar   banaa-ne=ko kah-aa
       Anjum.F=Erg Saddaf.F=Dat necklace.M=Nom make-Inf.obl give-Perf.M.Sg

       Anjum told Saddaf to make a necklace

Both constructions show exactly the same word order variations (scrambling).

(8) **Word Order Patterns in Urdu**

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- Simple phrase structure: the non-finite and the finite verb act as a unit, and the nominal arguments of both verbs scramble freely around it.

- Complex phrase structure: the non-finte embedded clause acts as a unit and can scramble freely with the other arguments around the matrix finite verb.

However, this does not mean that the two constructions should receive the same analysis. Butt shows that they behave differently with respect to their functional structure. Using object agreement, anaphora binding, and control of adjunct infinitival clauses as evidence, she shows that the instructive behaves like a biclausal[6] structure with an embedded (controled) subject, while the permissive behaves like a monoclausal structure without an embedded subject. She concludes that the permissive, but not the instructive, forms a *complex predicate*, which she defines as having the following characteristics:

- Two semantic heads at a-structure.

- A single predicate at f-structure.

- Simple or complex phrase structure at c-structure.

I will adopt her definition of complex predicate.

The Urdu constructions show a striking similarity to the two German constructions. Like the Urdu permissive, the German permissive has a "bare" infinitive (no Case marker in Urdu, no *zu* in German). The two options shown in (8) clearly are descriptively equivalent to the coherent and the incoherent construction, respectively. (I will henceforth refer to these word order patterns by the Germanic terminology.) An obvious difference, however, is that, unlike the Urdu permissive, the German permissive only allows the coherent construction. Thus, the hypothesis is plausible that German and Urdu permissives both form a complex predicate, and that German embedded *zu* infinitives, like Urdu instructives, do not. In the next section, I show that the second part of the hypothesis is true, while the first part is not: there is no evidence in German that either construction forms a complex predicate.

4   No Complex Predicates for the German Cases

Diagnostics for f-structure are more difficult to come by than diagnostics for c-structure. Of Butt's three diagnostics, agreement and control are not useful for German: German has only subject agreement (and

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[6]In this paper, I use the terms "biclausal" and "monoclausal" in reference to f-structure, and without hyphens.

the embedded infinitival does not have an overt subject), and control of adjuncts is not subject-oriented. This leaves anaphoric binding. This section also discusses negation as a possible f-structure diagnostic.

4.1 Anaphor Binding

The issue of anaphor binding in embedded infinitivals is not a trivial matter (for discussions, see (Reis, 1976; Huber, 1980; McKay, 1985)). In constructing relevant examples, subject-control verbs cannot be used, since anaphoric reference will not be able to distinguish between monoclausal and biclausal constructions. The following double example is based on a dative-control verb. For the *zu*-infinitives, the two-verb sequence is fronted to force a "coherent" construction; this is not actually necessary for the argument here, but reinforces the point.[7]

(9) a. Zu rasieren erlaubt hat der Meister$_i$ dem Lehrling$_j$ nur ihn$_{i,*j}$/sich$_{j,*i}$ selber
    to shave   allowed has the master the apprentice only him/himself   self

    The master has allowed the apprentice only to shave him/himself

  b. Der Meister hat den Lehrling ihn$_{?i,*j}$/sich$_{j,*i}$ rasieren lassen

The fact that in both constructions, the anaphor can only refer to *dem/den Lehrling*, which through control (or some other means such as raising) is the embedded subject, shows that this construction must be biclausal, since if it were (at least optionally) monoclausal, we would expect the binding by the matrix subject *der Meister* to be possible. A similar argument applies to the binding possibilities of the bare pronoun. (The fact that the use of the bare pronoun is degraded for the permissive may be attributable to the availability of the embedded passive, which is preferable:

(10) Der Meister hat sich   vom   Lehrling   rasieren lassen
    the master has himself by-the apprentice shave   let

    The master has had himself shaved by the apprentice

I will not discuss the embedded passive in permissives in this paper.) The same conclusion of a biclausal structure is reached if we use the reflexive anaphor *einander* 'each other':

(11) a. Zu rasieren erlaubt haben die Meister$_i$ den Lehrlingen$_j$ nur sie$_{i,*j}$ selber/einander$_{j,*i}$
    to shave   allowed have the masters the apprentices only them "selfs"/each other

    The master has allowed the apprentice only to shave him/himself

  b. Die Meister haben die Lehrlinge sie$_{?i,*j}$/einander$_{j,*i}$ rasieren lassen

An additional fact shows that this construction must be biclausal: in uncontroversially monoclausal sentences, a dative argument cannot bind an accusative argument (for reasons which to my knowledge are not known and which are irrelevant to the present point):

(12) a. Wir haben die Gäste   einander   vorgestellt
    we   have   [the guests]$_{ACC}$ [each other]$_{DAT}$ introduced

    We have introduced the guests to each other

  b. * Wir haben den Gästen   einander   vorgestellt
    we   have   [the guests]$_{DAT}$ [each other]$_{ACC}$ introduced

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[7]The *selber* is not itself anaphoric, but can be used after any type of pronoun to emphasize it. It is perhaps infelicitously glossed as 'self'. It is used to justify the appearance of pronouns in clause-final position, which otherwise would be odd.

However, in (9a) and (11a) above, a monoclausal interpretation would result in the dative *dem Lehrling/den Lehrlingen* binding the accusative *sich* or *einander*.

4.2   Negation

Negation (see (5) for examples) has usually been used to argue for a clause-union analysis of the coherent construction: if the negation marker located just before a two-verb sequence can negate either verb, then they must be a complex head of a single clause. However, as McKay (1985) points out, the very same fact also shows that at the level at which negation is interpreted, the two verbs must be represented separately. In GB, this level is presumably LF (or a level beyond LF). In an Evers-style transformational approach, the two verbs are represented separately at D-Structure, but not at S-Structure, and LF is derived from S-Structure. It would be unappealing to assume that verb raising is undone at LF. In the framework of LFG, this is not necessarily a problem: semantic interpretation is expressed at s-structure, and there is no reason to believe that f-structure must disambiguate the scope of negation in a complex predicate. Therefore, the fact that negation is ambiguous is not a direct diagnostic for a biclausal f-structure. However, it does show that, if these constructions were in fact monoclausal in German, then s-structure would nonetheless have to represent the two predicates separately.

5   Coherence At C-Structure?

The previous section shows that there is no evidence for complex predicates in German permissives and *zu*-infinitives, and that there is compelling if limited evidence against it. The conclusion then might be that German *zu*-infinitives are like the Urdu instructive, in that they are biclausal at f-structure, but allow for either complex or simple realizations at c-structure. The obligatorily coherent permissive would then not allow the complex phrase structure in (8). The term "clause union" used in the Germanic literature would then refer to a manner of mapping between f- and c-structures which results in a simple phrase structure from a biclausal f-structure. In this section, I show that such an approach is empirically inadequate, and theoretically troubled within LFG. The conclusion is that there is no "clause union" at c-structure, either.

5.1   Empirical Problems with Clause-Union

The descriptive generalizations for word order introduced in Section 2 are in fact open to question on empirical grounds.

- Fronted verb sequences:

  (13) (Netter, 1991):
        Versucht, einen Freund vorzustellen, hat er ihr noch nie

  Two verbs have been fronted, leaving behind some of each of their arguments. Therefore, this must be a coherent construction. At the same time, the embedded verb has been extraposed, which rules out a coherent construction.

- "Stranded" arguments/adjuncts in Third Construction:

  (14) a. (Bayer, 1992)

            daß er die Schweine vergessen hat dreimal zu füttern
            that he the pigs   forgot   has thrice   to feed

that he forgot to feed the pigs three times

b. (Kroch and Santorini, 1991)

daß uns Hans versuchte, seinen Wagen zu zeigen
that us$_{DAT}$ Hans tried his car to show

that Hand tried to show us his car

c. Uwe Johnson:
... daß ich diesen Beruf nach Fähigkeit und Neigung glaube am besten ausfüllen zu können

In these sentences, embedded arguments are among the matrix arguments, forcing a coherent construction reading. At the same time, extraposition rules it out.

- Negation:

(15) Wieso redet Jutta so behutsam mit Karsten?
Why is Jutta speaking so carefully with Karsten?

Weil ihn Jutta nicht zu beleidigen versucht
because him$_{ACC}$ Jutta not to insult tries

Because Jutta is trying not to insult him

In these sentences, embedded arguments are among the matrix arguments, forcing a coherent construction reading. At the same time, the embedded reading for the negation rules it out.

I therefore conclude that the mechanisms of extraposition, fronting, and scrambling are independent, and can all operate within a single sentence. It can be seen that the sentences above can be derived from separate and independent c-structure rules. The rules given in the following are an initial sketch of a larger grammar. They assume binary branching, but similar rules could be given for "flat" structures. I assume that all nodes are labeled XP, where X is the lexical category of the basis of the projection, and that the levels of the extended projection are differentiated by features (not shown here). (These features also control the V2 effect. See (Rambow and Santorini, 1995) for details.)

- Standard clausal embedding:

VP $\longrightarrow$ VP   VP
         ($\uparrow$ XCOMP) = $\downarrow$ $\uparrow$ = $\downarrow$

- Extraposition:

VP $\longrightarrow$ VP   VP
         $\uparrow$ = $\downarrow$ ($\uparrow$ XCOMP) = $\downarrow$

- Nominal Scrambling:

VP $\longrightarrow$ NP   VP
         ($\uparrow$ XCOMP[fin:-]* GF) = $\downarrow$ $\uparrow$ = $\downarrow$

- Fronting:

VP $\longrightarrow$ XP   VP
         ($\uparrow$ XCOMP* GF) = $\downarrow$ $\uparrow$ = $\downarrow$

5.2 Theoretical Problems With Clause-Union

Interestingly, there is another reason to question the "clause-union" analysis: it is extremely difficult, if not actually impossible, to represent it in LFG if there is no complex predicate at f-structure. In fact, the solution given in (Butt, 1995) for the problem of deriving the simplex clause from the biclausal f-structure of the permissive overgenerates, and allows the derivation of word orders such as the one in (20b) on Butt's page 45 which is ungrammatical. This is because, given only functional uncertainty, there is no obvious way of forcing nominal arguments to be attached at c-structure to the projection of a verb higher in the embedding hierarchy. (Of course it is possible to *prevent* the arguments form doing so.) For German, this result is not troubling, since the empirical claim that simplex clauses (clause union) must be generated has already been rejected.

The problem discussed above has a direct counterpart in the tree-adjoining grammar formalisms discussed in (Rambow, 1994; Rambow, 1995; Rambow et al., 1995). The use of "d-links" in trees (dominance links as opposed to immediate dominance links) corresponds to the use of functional uncertainty in LFG. The use of such d-links is crucial for the proper treatment of scrambling languages. While a derivation is possible which results in intermediate structures which represent the intuition of clause union, there is no way to force the formation of a complex verb in the syntax, and thus the data presented in the previous subsection is in fact predicted to occur.

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