Empty categories in LFG[*]

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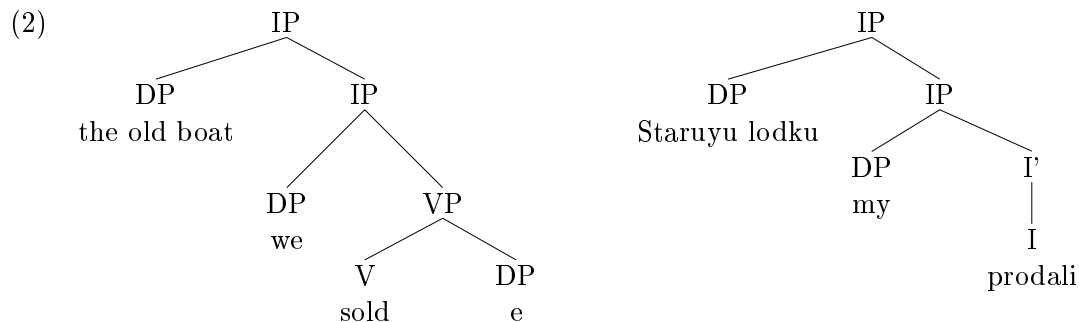
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This paper is concerned with the question whether there is any necessity and evidence for empty categories (specifically traces) in German. Following the analysis of weak crossover in Bresnan (1995b) and Choi (1995) it is shown that the German weak crossover data can be captured correctly if it is assumed that a topicalized constituent has to be linked with an empty category in its local domain (its minimal clause) only in the case of long distance dependencies. The empty category is independently motivated by a locality requirement on function specification, which is empirically supported by the fact that free word order in German is restricted to the local clause. It is further shown that the empty category cannot occupy the canonical position of the antecedent. Instead, it is claimed - based on work by Frey (1993) - that the specifier position of the functional category is the only position in which the empty category is licensed. The resulting analysis not only accounts for the weak crossover data, but is also shown to capture some restrictions on extraction and have implications for the structure of certain infinitival constructions in German.

1 Constraints on c-structure

In Bresnan (1995b) a specific economy principle is proposed to prevent the occurrence of unnecessary constituents in c-structure, namely economy of expression:

(1) Economy of expression: all c-structure nodes are optional, and are not used unless required for expressivity or completeness.

To illustrate this principle, Bresnan compares the topicalization structures of English and Russian (based on King 1995), which are given in (2).

(2)

```
            IP                                    IP
           /  \                                  /  \
         DP    IP                              DP    IP
     the old boat  / \                   Staruyu lodku  /  \
               DP   VP                               DP    I'
               we  /  \                               my    |
                  V    DP                                   I
                sold   e                                 prodali
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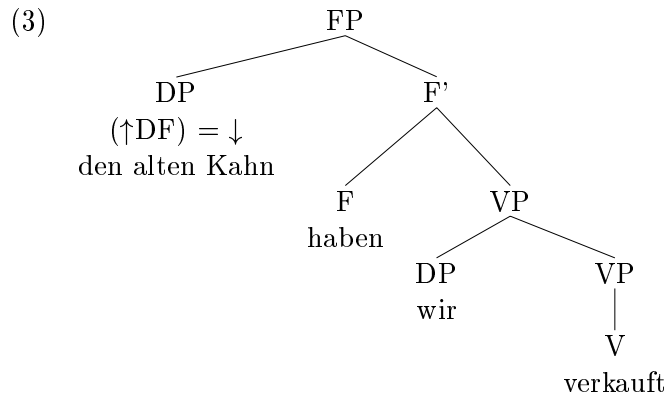
      The old boat, we sold   Staruyu lodku   my   prodali
                                      old (acc) boat (acc) we (nom) sold (pl)

While in Russian the syntactic functions are morphologically marked, in English, a configurational language, the functions are defined structurally. So in order to identify the function of a topicalized phrase in English, it must be linked to an empty category in the canonical position, but in Russian a trace would violate economy of expression, since the functional information is already given by the case morphology.

In German, syntactic functions are also morphologically marked, so we expect, parallel to Russian, that there is no empty category in the unmarked position of a topicalized or scrambled constituent. This is illustrated by the topicalization structure in (3).

(3)

```
                        FP
                   ┌─────┴─────┐
                  DP           F'
              (↑DF) = ↓     ┌───┴───┐
            den alten Kahn  F       VP
                          haben  ┌───┴───┐
                                DP       VP
                               wir       │
                                         V
                                      verkauft
```

Den alten Kahn	haben	wir	verkauft
the old boat (acc)	have (pl)	we (nom)	sold

Following Haider (1993) simple sentences in German are analyzed as containing only one functional projection (called FP), which embeds a VP. In (3), the topicalized object 'the old boat' is located in the specifier position of the functional projection, a position for discourse functions[1] (see section 2.2).

Evidence for analyzing topicalization sentences like (3) without a trace comes from the pattern of operator binding in such sentences. This is discussed in the next section.

2 Weak crossover

The sentences in (4) illustrate the basic facts of operator binding in German sentences with clause-internal topicalization:

(4) a. $Jeder_i$/ Wer_i mag $seine_i$ Mutter
       everyone (nom)/ who (nom) likes his mother (acc)
       'Everyone likes his mother'/'Who likes his mother?'

   b. $Jeden_i$/ Wen_i mag $seine_i$ Mutter
       everyone (acc)/ who (acc) likes his mother (nom)
       'Everyone, his mother likes'/'Who does his mother like?'

   c. $Seine_i$ Mutter   mag $jeder_i$
       his mother (acc) likes everyone (nom)
       'His mother, everyone likes'

---

[1]Including (non-in-situ) wh-phrases.

    d. *Seine$_i$ Mutter   mag jeden$_i$
      his mother (nom) likes everyone (acc)
      'His mother likes everyone'

As we will see, this pattern can be accounted for in terms of the analysis of operator binding in Bresnan (1995b), which is presented in the next subsection.

2.1   Bresnan (1995b)

In Bresnan (1995b) operator binding is restricted by the so-called prominence principle:

(5) **Prominence principle**: A binder excludes from its domain any element more prominent than it.

The domain of a binder is informally defined as follows (Bresnan 1995 (30)):

(6) The **domain** of a binder is the minimal clause or predication structure containing it (formally modelled as the minimal f-structure).

At each level of representation the relation of prominence is determined by properties specific to that level. These are given by the following definitions (cf. Bresnan 1995 (31)):

(7) a. α **outranks** β if α and β belong to the same f-structure and α is more prominent than β on the functional hierarchy or α outranks some γ that contains β.

    b. **Syntactic rank**: a relation of prominence among (expressed or unexpressed) syntactic arguments, based on the **functional hierarchy** SUBJ > OBJ > OBJ$_\theta$ > OBL$_\theta$ > COMPL > ...

(8) a. The **linear order** of α and β is determined by the right edges of their lexical expressions; reduces to simple linear order in the string whenever the correspondence between arguments and the nodes that express them is one-to-one.

    b. The **lexical expression** of an argument consists of any c-structure word or bound form that lexically carries the semantic features of the argument, together with all nonterminal phrase structure nodes that also correspond to the argument.

(9) **Thematic prominence**: a relation of prominence among arguments associated with the same argument structure; inherited from the underlying semantic or role structure (e.g. Dowty 1991, Jackendoff 1990, Bresnan and Zaenen 1990, Alsina 1993).

What results from these distinct notions of prominence are the following level-specific instantiations of the prominence principle:

(10) **Resulting domain constraints on pronominal binding:**

(i) The domain of α excludes any β that outranks α (in f-structure)

(ii) The domain of α excludes any β that precedes α (in c-structure)

(iii) The domain of α excludes any β that is thematically more prominent than α (in a-structure)

Consequently, the effect of the prominence principle may differ at each level of representation. Moreover, cross-linguistic differences in the distribution of operator binding may be accounted for by assuming that languages observe different combinations of the level-specific constraints. Bresnan (1995b) proposes the following illustrative weak crossover typology, based on the domain constraints at f-structure (i) and c-structure (ii):

English, Palauan	(i) & (ii)
German, Korean	(i) v (ii)
Chichewa, Kiswahili	(i)
Malayalam, Hindi	(ii)

2.1.1 Choi (1995)

The idea that operator binding in languages like Korean and German is constrained by the disjunction of the f-structure and c-structure constraints is due to Choi (1995). She showed that this directly accounts for the possibilities of scrambling in Korean and German; her German examples are given in (11).

(11) a. dass jeder$_i$ seine$_i$ Mutter   mag
     that everyone (nom) his mother (acc) likes
     'that everyone likes his mother'

    b. dass jeden$_i$ seine$_i$ Mutter   mag
     that everyone (acc) his mother (nom) likes
     'that his mother likes everyone'

    c. dass seine$_i$ Mutter   jeder$_i$ mag
     that his mother (acc) everyone (nom) likes
     'that everyone likes his mother'

    d. *dass seine$_i$ Mutter   jeden$_i$ mag
     that   his mother (nom) everyone (acc) likes
     'that his mother likes everyone'

Only in (11d) is the bound reading of the pronoun not available, and it is only in this example that the pronoun is excluded from the operator's binding domain in both c-structure and f-structure. In

contrast, in (11b) binding is excluded in f-structure, but not in c-structure, so the bound reading is correctly predicted.[2]

As a comparison of the sentences in (11) with those in (4) makes clear, the pattern of operator binding is the same in both scrambling and clause-internal topicalization. Thus, Choi's account will also apply directly to the latter.

This analysis succeeds only because no trace of the scrambled or topicalized constituent is assumed. If there were a trace in the canonical position of the antecedent in (4b) and (11b), the sentences would have the following structures:

(12) a. $Jeden_i/Wen_i$ mag $seine_i$ Mutter e_i

   b. weil $jeden_i$ $seine_i$ Mutter e_i mag

In both of these structures, the pronoun precedes the right edge of the operator, so by (8) it precedes the operator, and is therefore excluded from its domain in c-structure. Thus, with a trace the bound reading would be wrongly ruled out.[3]

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[2] These results in f-structure follow only on the assumption that β in (10i) stands for, not just the outer f-structure (e.g. corresponding to the DP node of the phrase 'seine Mutter' in (11)), but also all f-structures it may contain - in particular the one corresponding to the possessive pronoun 'seine'. The earlier formulation of the f-structure condition on operator binding given in Bresnan (1995a: 252 (20)) is less ambiguous in this respect; it reads: "The pronominal binding domain of an operator O is restricted to the set of f-structure elements that O outranks." There is also no ambiguity in the formulation of the c-structure constraint (10ii), due to the nature of linear orders.

[3] That a-structure also plays a role is seen by the possibility of backwards binding. According to Frank/Lee/Rambow (1992) and Frey (1993) backwards binding is possible only for subjects; this is illustrated by the following sentences (from Frank/Lee/Rambow 1992: (17b), (21a)):

(i) *Ich glaube, dass der Jörg $seinem_i$ Vater $jeden_i$ gezeigt hat
     I think that   art J. (nom) his_i father (dat) $everyone_i$ (acc) shown has
     'I think that J. has shown his_i father $everyone_i$'

(ii) *Ich glaube, dass der Jörg $seinen_i$ Vater $jedem_i$ gezeigt hat
     I think that   art J. (nom) his_i father (acc) $everyone_i$ (dat) shown has
     'I think that J. has shown $everyone_i$ his_i father'

To account for this Bresnan (1995b) suggested that in any sentence in German the domain constraints must be satisfied in at least two of the three levels of representation: in (i) the constraint is satisfied only at f-structure and in (ii) only at a-structure (assuming the thematic hierarchy: agent > beneficiary > experiencer/goal > instrument > patient/theme > locative in Bresnan and Zaenen 1990). However Choi (1995:4) reports (iii) as an acceptable example of backwards binding from the dative object to the accusative object (and I share this judgement).

(iii) dass man $seine_i$ Tanzpartnerin $jedem_i$ vorstellte
     that they his dance partner (acc) everyone (dat) introduced
     'that they introduced to everyone his dance partner'

To account for this, it might be proposed that operator binding in German is constrained by the disjunction of the a-structure and c-structure constraints (at least in the dialects of those speakers who accept these data). However, since this issue is not directly relevant to the concerns of this paper, for simplicity I ignore such data as (i)-(iii) and thus put aside the role of a-structure.

2.1.2 Weak crossover involving long distance dependencies

In examples like (13), which involve long distance dependencies (the topicalized operator here is the direct object of the embedded verb), the pronoun cannot be understood as bound by the operator.

(13) *Jeden$_i$/   *Wen$_i$ sagte seine$_i$ Mutter,   habe sie getröstet
     everyone (acc)/ who (acc) said   his mother (nom) has   she consoled
     'Everyone$_i$, his$_i$ mother said she consoled'/'Who$_i$ did his$_i$ mother say she consoled?'

The analysis presented above fails to account for this. Although the binding condition is not satisfied in f-structure, since the pronoun is contained in an element that outranks the operator, still the operator precedes the pronoun, and according to Choi's analysis that is sufficient to sanction binding.

Bresnan (1995b) discusses an analogous example in Hindi. She observes that on the assumption that function specification by morphology is only locally accessible, there must be an empty category inside the local clause in order to assign the correct argument-predicate relation between the operator and the embedded verb. (Note that since this empty category is required in order to satisfy completeness, it does not violate economy of expression.) Applying this proposal to German, (13) must be analyzed as having a structure like the following:

(14) *Jeden$_i$/*Wen$_i$ sagte seine$_i$ Mutter, habe sie e$_i$ getröstet

Here, the right edge of the operator follows the pronoun, so by the definition of linear order the pronoun precedes the operator and so is excluded from its binding domain. Thus, the presence of the trace correctly predicts the absence of the bound reading in (13).

One piece of evidence that morphology identifies syntactic functions only locally in German is that free word order is restricted to the local clause. Within the local clause almost every order is grammatical, but outside the clause there is only one position for long distance dependencies available, namely FPSpec (see section 2.2). In other words, in German, long distance scrambling is ungrammatical.

Now consider the long distance dependency in (15). Here, in contrast to (13), the bound reading is possible. This shows that the position of the empty category cannot be in the canonical position of the antecedent (indicated in (15) by *e$_i$), since then by (8) the pronoun would precede the operator.

(15) Jeden$_i$/   Wen$_i$ sagte sie, habe seine$_i$ Mutter   (*e$_i$) getröstet
     everyone (acc)/ who (acc) said   she have his mother (nom)   consoled
     '(Of) everyone$_i$, she said his$_i$ mother consoled (him$_i$)'/'Who$_i$ did she say his$_i$ mother
     consoled?'

Again the analogous fact obtains in Hindi, and to account for it Bresnan (1995b) proposed (based on work by Mahajan 1990) that the trace of the extractee may be freely ordered (this was also proposed by Haider 1987 for German). Then the trace may occur before the subject, as shown in (16), and the possibility of binding is correctly predicted.

(16) Jeden$_i$/Wen$_i$ sagte sie, habe e$_i$ seine$_i$ Mutter getröstet

I accept the idea that in long distance dependencies, there must be an empty category inside the local domain. However, rather than allowing it to be freely ordered, we will see that it is possible to localize the empty category unambigously, by building on work by Frey (1993). The resulting analysis will be shown to make several correct predictions that the free-order theory does not make. First, the relevant points of Frey's analysis of operator binding will be very briefly presented.

2.2 An Unambiguous Position for the Empty Category

Frey (1993), working within the general framework of GB, showed that the assumption usually made in GB, that an operator has to c-command a pronoun at d-structure in order to bind it, makes wrong predictions. We have seen examples of this in (12), repeated here for convenience:

(17) a. Jeden$_i$ /Wen$_i$ mag seine$_i$ Mutter   e$_i$
     everyone (acc)/who (acc) likes his mother (nom)

    b. weil   jeden$_i$ seine$_i$ Mutter   e$_i$ mag
     because everyone (acc) his mother (nom)   likes

Frey proposed that there is a special relation between the subject argument and the functional head of the sentence (the position we have labelled F in (3)), which enables an operator bearing the subject argument to bind any other argument c-commanded by F. Since by definition F in fact c-commands all nodes dominated by its maximal projection FP, this accounts for the possibility of binding in (17) (cf. Frey 1993: 91). But as we have shown above, we account for these cases by how the prominence principle operates in German; therefore, we have no need to follow Frey's assumptions about the role of F in operator binding. For the pattern of binding in long distance dependencies, on the other hand, Frey makes a proposal that can be profitably adapted to the present analysis.

Specifically, Frey proposes that an extracted binder or bindee has to be reconstructed into the structurally highest position of its chain within the local domain. For example, in a configuration like (18) the binder or the bindee has to be reconstructed into the lowest IPSpec-position.

(18) [XP$_1$ ...[$_{Vmax}$ ... [$_{IP}$ t"$_1$ [$_{Vmax}$... [$_{IP}$ t'$_1$ [$_{Vmax}$ ... t$_1$ ... V] ...]' (Frey (1993: 87))
                                  ⇑

This is the position we are calling FPSpec.

It should be noted that Frey does not assume an LF level of representation, so reconstruction should not be understood in a literal sense; rather, he uses the term to refer to the position in the chain to which binding principles apply.

Suppose we refine Frey's proposal by claiming that in general the empty category needed in the case of long distance dependencies can only occur in the local FPSpec. Then we get the right results for the weak crossover data, as seen in (19). Compare these with (14) and (16).

(19) a. *Jeden$_i$/*Wen$_i$ sagte seine$_i$ Mutter, [$_{FP}$ e$_i$ habe sie getröstet]

    b. Jeden$_i$/Wen$_i$ sagte sie, [$_{FP}$ e$_i$ habe seine$_i$ Mutter getröstet]

Note that on Frey's GB-based analysis there are additional traces within the local VP, namely in the base position or scrambled position of the extracted constituent. But on the present analysis these additional traces are not permitted by economy of expression, given morphological marking in German.

In short, my proposal is that there is exactly one empty category in long distance dependencies, and it occupies the local FPSpec. Why should this position be singled out?

Since we have adopted Bresnan's assumption that morphology can identify syntactic functions only locally, it follows that the trace is only used as a last resort to identify the syntactic function of the extracted element. Now recall from the c-structure given in (3) that FPSpec is a designated c-structural position for discourse functions. In fact, it is the only position in German which is associated with a specific grammatical function. In contrast, inside the German VP there is no structure-function association. In other words, in German the functional projection is configurational, while the VP is not. The claim is now that an empty category is only licensed in configurational - that is, functionally unambiguous - positions. Note that on this hypothesis we expect evidence for empty categories inside the VP in English, but not in German, and this is what we find.[4]

Restricting the empty category to this position has several advantages. First, this is an unambiguous position. Thus with an empty category in this position the sentence is much easier to process computationally than if the empty category can appear anywhere inside the VP.

Second, having the empty category in the local FPSpec means that the structural prominence obtained by the antecedent in c-structure is reflected inside its local domain. In other words, an extracted element is still marked as prominent within its local domain at c-structure. This is necessary to account for examples like (19b).

Third, the localization of the empty category accounts for certain restrictions on extraction.[5] As we will see, FPSpec is the only position which allows a constituent to leave the local clause.

3   Long Distance Dependencies

In general, extraction is possible in German out of a finite or non-finite argument clause, but impossible out of an adjunct clause. Both adjuncts and arguments are extractable constituents. The examples in (20) illustrate these facts:

(20) a. Wer   glaubst Du,   kommt morgen
         who (nom) think   you (nom) comes   tomorrow
         'Who do you think is coming tomorrow?'

---

[4]This was pointed out to me by Gert Webelhuth.

[5]This was suggested to me by Joan Bresnan.

    b. Wie lange hat er behauptet, geschlafen zu haben
       how long   has he claimed   slept   to have (inf)
       'How long did he claim to have slept?'

    c. *Welchen Zug   hat sie sich beeilt, damit   sie noch erreicht
       which train (acc) has she refl hurry so=that she still   reaches
       *'Which train did she hurry so that she would make?'

Kaplan/Zaenen (1995) account for long distance dependencies with outside-in functional uncertainty. They subdivide the conditions on functional uncertainty into the bottom, which contains the potential functions at the end of the uncertainty path, and the body, which contains the functions in the middle of the path. Following Kaplan/Zaenen we can formulate the equation in (21) to account for long distance dependencies in German:[6]

(21) $(\uparrow DF) = (\uparrow \{COMP|XCOMP\}^* \; GF)$

The antecedent occupies the specifier of the functional category of the matrix clause, which is filled by a discourse function. The body contains finite and non-finite argument clauses, and the bottom contains arguments as well as adjuncts. So this equation captures the fact that it is grammatical to extract out of finite and non-finite argument clauses, but ungrammatical to extract out of an adjunct clause.

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[6]In Kaplan/Zaenen's analysis of English, COMP is excluded from the bottom functions. They formulate the following equation for long distance dependencies in English $(\uparrow DF) = (\uparrow \{COMP|XCOMP\}^* \; GF\text{-}COMP)$. In German analogous restrictions were observed by Webelhuth (1992). Only verbs which also subcategorize for a nominal object allow their sentential complement to be topicalized:

  (i) Maria   ärgert das
      Maria (acc) annoys that (nom)
      'That annoys Maria'

  (ii) Dass sie den Bus verpasst hat, ärgert Maria
      That she the bus missed has   annoys Mary (acc)
      'That she missed the bus annoys Maria'

  (iii) *Maria   ärgert sich das
      Maria (nom) annoys refl that

  (iv) *Dass sie den Bus verpasst hat, ärgert   sich Maria
      That   she the bus missed has   annoys refl Maria (nom)

In Berman (1996) this distinction is captured by assuming that every finite argument clause is obligatorily left-dislocated and that in accordance with the conditions on topic-drop in German only the subject- and accusative object-pronoun can be dropped, but not the dative-/genitive- and prepositional object-pronoun.

  (v) Dass sie den Bus verpasst hat, (das) ärgert Maria
      'That she missed the bus, (that) annoys Maria'

  (vi) Dass sie den Bus verpasst hat, *(darüber) ärgert sich Maria
      'That she missed the bus, Maria is annoyed *(about that)'

On this analysis, COMP doesn't have to be excluded from the bottom functions.

3.1 Further restriction on long distance dependencies

But (21) cannot account for certain word order restrictions in the clause that is extracted out of. In particular, the finite verb must be the first word in the extraction clause, as shown by the examples in (22):

(22) a. Diesen Teilnehmer   glaube ich, [$_{FP}$ kennt niemand]
      this participant (acc) think I   knows nobody (nom)
      'This participant, I think nobody knows'

    b. *Diesen Teilnehmer   glaube ich, [$_{FP}$ niemand   kennt]
      this participant (acc) think I   nobody (nom) knows
      'This participant, I think nobody knows'

    c. *Diesen Teilnehmer   glaube ich, [$_{FP}$ dass niemand   kennt]
      this participant (acc) think I   that nobody (nom) knows
      'This participant, I think that nobody knows'

On my analysis (22a) is assigned the following structure:

(23) Diesen Teilnehmer$_i$ glaube ich, [$_{FP}$ e$_i$ kennt niemand]

As this structure makes clear, the embedded clause has so-called verb-second word order:[7] the verb occupies the head of the functional projection and the empty category occupies FPSpec. Thus (23) satisfies the locality condition on function specification. But if FPSpec is lexically filled, as in (22b), the locality condition cannot be satisfied. Extraction out of a dass-clause, as in (22c), is also ungrammatical, since generally in standard German the specifier of a lexically filled complementizer cannot also be filled. This means there is no available position for the required trace.

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[7]Reis (1995) argues that extraction out of a verb-second-clause is not possible at all in German. In her view all these cases are 'Verb-first Integrated Parentheticals'. However as Hubert Haider pointed out to me, there are some distinctions between parentheticals and the extraction-configuration. For example, true parentheticals (as determined by their position in the string) do not permit certain particles such as 'denn', as in (i), or wh-in-situ, as in (ii):

 (i) *Wo habe   Karl, sagte sie denn, es versteckt.
     where has (subjn) Karl said she PRT it hidden
     *'Where did Karl, so did she say, hide it?'

 (ii) *Womit   soll   Karl, hat wer behauptet, den Tresor geknackt haben.
      with-what is-supposed Karl has who claimed   the safe   cracked has
      *'What is Karl supposed, who claimed, to have cracked the safe with?'

In constrast, the following sentences are fine, which implies they do not involve parentheticals:

 (iii) Wo sagte sie denn, habe Karl es versteckt
      'So where did she say Karl hid it?'

 (iv) Womit hat wer behauptet, soll Karl den Tresor geknackt haben
      'Who claimed that Karl is supposed to have cracked the safe with what?'

  So I assume that German has both extraction from verb-second clauses as well as verb-first-parenthetical expressions.
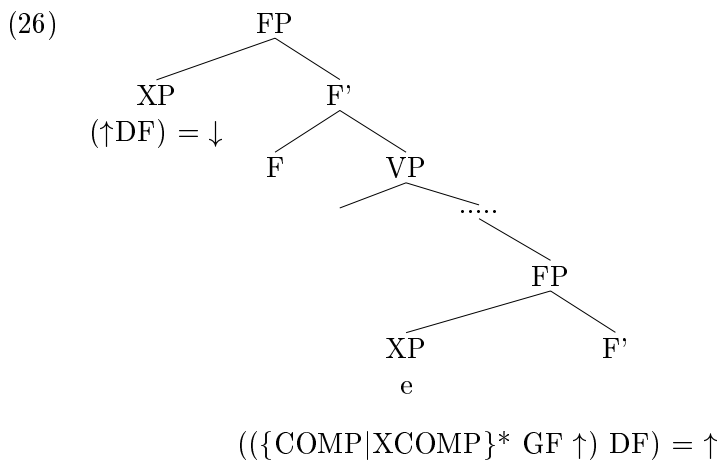
In dialects such as Bavarian, in contrast, which permit a 'doubly filled COMP' as in (24a), extraction out of a dass-clause is possible - more precisely, extraction out of the specifier of the dass-clause, as in (24b).

(24) a. Ich sage nicht, wen   dass der Hans   liebt
          I   say   not, who (acc) that the Hans (nom) loves
          'I'm not saying who Hans loves'

      b. Wen$_i$ sagst du, e$_i$ dass der Hans   liebt
          who (acc) say   you   that the Hans (nom) loves
          'Who are you saying that Hans loves?'

But also in Bavarian, if the specifier position is lexically filled (creating a wh-island), extraction is ungrammatical:

(25) *Den Hans   sage ich nicht, wer   dass liebt
      the Hans (acc) say I   not   who (nom) that knows
      *'Hans, I'm not saying who loves'

My analysis of extraction in German can be formalized by using inside-out functional uncertainty, as proposed by Bresnan (1995c) for topicalization in English, and adopting the distinction made by Kaplan/Zaenen between body and bottom. This results in annotated c-structures for long distance dependencies like (26):

(26)

```
                        FP
                   ┌─────┴─────┐
                  XP            F'
             (↑DF) = ↓      ┌───┴────┐
                            F        VP
                                  ┌──┴·····
                                          FP
                                      ┌───┴───┐
                                     XP        F'
                                      e
                 (({COMP|XCOMP}* GF ↑) DF) = ↑
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3.1.1 Multiply embedded clauses

Since the empty category is required for function specification only inside the local domain of the extractee, economy of expression prevents intermediate traces in the case of extraction out of a multiply embedded clause. However, when the specifier of an intermediate clause is occupied by another constituent, as in (27b), the sentence is in fact ungrammatical:

(27) a. [Den Peter]$_i$ glaube ich, sagte der Hans   gestern,   e$_i$ hat
        the Peter (acc) think   I   said   the Hans (nom) yesterday   has

        die Maria   eingeladen
        the Maria (acc)   invited
        'Peter (is who) I think Hans said yesterday Maria invited'

   b. *[Den Peter]$_i$ glaube ich, gestern   sagte der Hans,   e$_i$ hat
        the Peter (acc) think   I   yesterday   said   the Hans (nom)   has

        die Maria   eingeladen
        the Maria (acc)   invited

To account for this, I propose that the empty category in the local FPSpec must be linked with the nearest potential antecedent, that is, the next higher lexically filled FPSpec. This can be thought of as a kind of economy requirement.

In (27b), the nearest potential antecedent is 'gestern'. But identifying the f-structure of 'gestern' and the empty category would violate completeness, since the verb 'einladen' would lack an object of the appropriate sort. In (27a), on the other hand, the nearest potential antecedent is 'den Peter' in the matrix FPSpec, since the intermediate FPSpec-position is not filled, and this is an appropriate object of 'einladen'.

We can formulate the necessary condition by restricting the body-path so that the body does not pass an f-structure containing a discourse function (this is similiar to the way Dalrymple 1993 formulates restrictions on anaphoric binding). The resulting equation is given in (28).

(28)   (({ XCOMP, COMP}*   GF ↑)   DF) = ↑
                $\neg$ (→ DF)

4   The Structure of Infinitives

To conclude, it may be noted that my analysis also has consequences for the structure of infinitives. As the examples in (29) show, operator binding is possible only with so-called coherent infinitives, as in (29a), but not with incoherent infinitives, as in (29b).

(29) a. Wen$_i$ versucht seine$_i$ Mutter   zu trösten
        who (acc) tries   his mother (nom) to console
        *'Who$_i$ is his$_i$ mother trying to console'

   b. *Wen$_i$ zwingt seine$_i$ Mutter   Maria,   [$_{FP}$ t$_i$ zu heiraten]
        who (acc) forces his mother (nom) Maria (acc)   to marry
        *'Who$_i$ is his$_i$ mother forcing Mary to marry'

Sentences with coherent infinitives have properties of monoclausal sentences (cf. Bech (1955/57), Haider (1991/1993) and others). This means that the operator in (29a) is inside its local domain. However sentences with incoherent infinitives are biclausal, so the operator in (29b) is in the matrix

clause, outside its local domain. This suggests that an empty category must be present in incoherent infinitives but not in coherent ones. If the proposal that the empty category must occur in FPSpec is right, then the grammaticality contrast in (29) provides independent support, in addition to distributional properties, for the analysis of incoherent infinitives as FPs and coherent infinitives as non-functional-projections.

Binding by a lower-ranked operator is also possible in the so-called third construction, illustrated by the following examples:

(30) weil   jeden₁   seine₁ Mutter   versucht hat zu trösten
      because everyone (acc) his mother (nom) tried has   to console
      'because his mother has tried to console everyone'

In this case the infinitive is extraposed, but one argument of the infinitive (here 'jeden') is in the so-called 'Mittelfeld'. Since binding is possible, it follows on the present analysis that there is no empty category of the 'long-distance-scrambled' element; rather, this must be base-generated in its c-structure position.[8]

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[8]This was also proposed by Bayer/Kornfilt (1994) in the framework of GB.

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