ON THE JUSTIFICATION FOR FUNCTIONAL CATEGORIES IN LFG[*]

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Abstract

Recent versions of LFG permit functional as well as lexical categories (Bresnan To appear). A liberal interpretation of the principles governing functional categories allows lexical categories which are morphologically marked for some functional feature (like tense or definiteness) to be considered as functional categories, and therefore as potential occupants of functional nodes. This allows LFG analyses effectively to mimic analyses in other theories which use movement from lexical to functional nodes. On the basis of two case studies, definiteness in Scandinavian and focus in Hungarian, we argue that there are viable alternatives consistent with LFG which allow a more restrictive account of functional categories. These alternatives use OT-style order constraints to capture the positioning of definiteness marking and discourse functions.

1 Introduction

In recent versions of Lexical Functional Grammar (LFG), the theory of phrase structure permits functional as well as lexical categories (Bresnan To appear). The distinction between functional and lexical categories is based on two principles: (1) Specialization and (2) Structure-Function Association:

(1) Specialization

functional categories are specialized subclasses of lexical categories which have a syncategorematic role in the grammar (such as marking subordination, clause type or finiteness).

(2) Structure-Function Association: (a) specifiers of functional categories are the grammaticalised discourse functions (TOP, FOC, SUBJ); (b) complements of functional categories are f-structure co-heads; (c) complements of lexical categories are the non-discourse argument functions.

In principle, LFG provides (correctly, we believe) a more restrictive theory of functional categories than the Principles and Parameters framework (P&P).[1] In P&P, there is a tendency for the existence of a morphological category (e.g. tense) to result in the postulation of a corresponding functional category (e.g. TenseP). This functional category, even though frequently empty-headed, projects fully to phrasal level, then acts minimally as a checking domain for the tense feature. The nature of checking (feature attraction or overt movement) is the prime source of surface structure variation, given the straightjacket of a hierarchy of functional projections.

LFG does not require functional information to be represented in the syntax in this way, unless there is independent evidence for syntactic status. To use the same example as in the previous paragraph: the tense morphology of a verb can map directly to f-structure. The feature-checking motivation for functional categories is removed, and thereby the majority of empty-headed functional categories. LFG does permit functional categories, but their existence is based on the principle of Specialization: functional categories are genuine closed subclasses of lexical items with grammatical functions. Bresnan (To appear) appears to suggest three functional categories: C, I and D. Complementisers like *that* and determiners like *the* indeed seem to be sufficiently distinct from verbs and nouns respectively to justify separate functional category status. I is however used variously to represent auxiliary verbs (which look like a special subclass of verb) and clusters of grammatical features (tense, agreement) which are precisely not verbs, and are spelled out in certain linear positions (e.g. second position in the analysis of Warlbiri in Austin & Bresnan (1996)). Arguably these are not the same and should be handled distinctly.

Despite the potential restrictiveness of the LFG conception of functional categories, a liberal interpretation of Specialization has come to allow lexical categories

which are morphologically marked for some functional feature (like tense or definiteness) to be considered as functional categories, and therefore as potential occupants of functional nodes (many such analyses can be found in the LFG literature, for examples, see Kroeger (1993), King (1995) and Sells (1998)). In conjunction with clause (b) of Structure-Function Association, this allows LFG analyses effectively to mimic P&P analyses which use movement from lexical to functional nodes, though of course, because of the principle of Economy of Expression (3), traces are disallowed per se:

(3)   Economy of Expression
       All syntactic phrase structure nodes are optional and are not used unless required
       by independent principles   Bresnan (To appear)

       There are then two ways of allowing morphological features to make a functional contribution: this contribution can be achieved directly by mapping morphological features to f-structure; or it can be achieved by permitting an inflected lexical category to occur in the functional category which is its co-head. Given that these two alternative analyses have far-reaching consequences for phrase structure, there should be some way of establishing which of the two analyses is appropriate for a particular construction. The option of simply adopting the functional head analysis in all cases in which P&P has a head-movement analysis is clearly unacceptable since LFG allows an alternative in which syntactic structure need not be postulated: the choice must be independently motivated within LFG.
       One intuition behind the use of functional categories to host inflected lexical elements is that certain features sometimes appear to be associated with a particular linear position, e.g. verbal inflection is associated with second position in the clause. To our knowledge an analysis in terms of a functional head for such phenomena was first suggested in writing within LFG by Kroeger (1993:6).[2] In such analyses, it is typically argued that the initial position in the clause is occupied by a discourse function (TOP, FOC or SUBJ); then, given clause (a) of Structure-Function Association, this discourse function occupies the specifier position of the functional projection. It should be noted first of all, however, that the postulation of the functional category does not in itself force a head-movement-mimicking analysis in which the inflected verb heads the functional category. In conjunction with clause (a) of Structure-Function Association, the principle of Economy of Expression can be interpreted in such a way that a functional projection is justified by a specifier, without the head being filled. This is illustrated in (4a), and can be compared with the head-movement-mimicking analysis in (4b):

(4)

       In this paper, we argue, on the basis of two case studies, definiteness in Scandinavian and focus in Hungarian, that LFG should be circumspect about the movement analyses which are postulated in P&P and hence about postulating head-movement-mimicking analyses such as that in (4b). However, we also argue that LFG should be circumspect about an interpretation of Economy of Expression which permits analyses such as (4a): allowing functional projections to exist solely on the basis that their specifier position is required opens the floodgates to a multiplicity of functional projections beyond those which are genuinely justified by the principle of Specialization. As an alternative, we speculate that the linear exponence of definiteness in Scandinavian and of the finite verb in Hungarian might most appropriately be handled by Optimality Theory (OT) alignment constraints. Adding such constraints to the LFG armoury is consistent with the basic LFG architecture, and provides an

alternative to the claim that discourse functions are invariably associated with functional projections.

2 Scandinavian

The Scandinavian languages all have nouns which are morphologically marked for definiteness. In all the Scandinavian languages except Icelandic, a bare singular count noun cannot function as a full referential noun phrase on its own, as in English. This is illustrated in (5a) for Danish. In its definite form, the same noun can, however, occur in any argument position in the clause, for example as subject (5b).

(5)   a. *Æble   var   godt.
           apple   was   tasty
      b. Æblet   var   godt.
         apple.DEF was   tasty
         'The apple was tasty.'

The fact that the definite ending, which can be shown to be an inflection on the noun rather than a syntactic element (Börjars 1998:40–88), seems to perform the same function as the syntactic determiner in English — i.e. it represents the same functional features as *the* — has led to a syntactic analysis of the element within P&P. The standard P&P analysis involves the postulation of (at least) one functional category (D), with a full projection (DP) into which the definite noun moves.

   The argument in this approach would appear to be that if two elements have the same function, they have the same syntactic status and position. Such an argument would not follow in LFG, since functional information is captured at a separate level, f-structure. The information in f-structure can be mapped from configurational (c-structure) or from morphological (m-structure) information.[3] There are then in principle two ways of capturing the effect of the definiteness feature in Scandinavian within LFG: the definite ending, or rather the feature it represents, can be assumed to permit the noun to occur under the functional node D; or the definiteness feature can be assumed to map directly to f-structure. This can be represented as in (6a) and (6b), respectively. In either approach, the non-definite form would have the partial specification in (6c).[4]

(6)   a. æblet CAT:D
              (↑SPEC)=DEF
      b. æblet CAT:N
              (↑SPEC)=DEF
      c. æble CAT:N

   Even though head-movement-mimicking analyses are common within LFG, the exact status of specifications such as (6a) has not been terribly well explored, We can assume that a noun like *æblet* 'apple.DEF' is formed from *æble* in the morphology: one would have to define morphology in a strange way in order for this not to be a morphological operation. On the other hand, the nature of the morphological operation which creates (6a) from (6c) is unclear. Given standard assumptions about morphology, we would be dealing with a derivational process here, but one whose existence is based on rather unorthodox arguments.

   The analysis in favour of which we shall argue is that created by (6b). This approach can, in principle, form part of either a DP analysis or an NP analysis. In the former, the presence of a syntactic determiner would add a DP projection above the NP created by the noun. The fact that a noun phrase containing a determiner would be a DP, and one consisting of just a definite noun would be an NP in such an approach would not create problems in LFG since selection is specified in functional terms, so that the crucial criteria for a full referential noun phrase could be expressed in terms of

the value of SPEC rather than in terms of category. Given the aim of this article to explore a maximally restrictive approach to functional projections, we shall assume that determiners are not head of the noun phrase, but what we propose below would be equally valid in an analysis in which a syntactic determiner, when present, heads the noun phrase.[5]

Consider now the Danish data in (7), where an asterisk indicates that the string is not a possible full referential noun phrase.

(7) a. æblet
        apple.DEF
        'the apple'

    b. *æble
        apple
        'an apple'

    c. *det   æble
        DEF   apple
        'the apple'

    d. det   æble
        DEM   apple
        'that apple'

    e. *det   æblet
        DEF   apple.DEF
        'the apple'

    f. et æble
        INDEF apple
        'an apple'

    g. det   store   æble
        DEF   big.WK apple
        'the big apple'

    h. *det   store   æblet
        DEF   big.WK apple.DEF
        'the big apple'

    i. *store æblet
        big   apple
        'the big apple'

The question now is whether data like this can help us decide between the two types of analysis. Given an optimally restrictive theory of grammar, we will want to use the least machinery required to provide a satisfactory analysis. This means that an analysis which does not mimic head-to-head movement is in principle to be preferred. The general pattern for the Scandinavian languages appears to be that definiteness needs exponence in some way within in the noun phrase, but that it does not matter whether the definiteness feature is contributed by a syntactic element or a morphological one. In Danish, when the feature is carried by an element other than the noun (this can be because there is an adjective present as in (7g), or because a demonstrative is used as in (7d)), the noun does not carry marking for definiteness (hence the ungrammaticality of (7e) and (7h). If we assume that non-definite nouns do not actually carry any specification for definiteness, then this generalisation can be extended to indefinite noun phrases such as (7b) and (7f). What has been said here about Danish is also largely true for Icelandic. In Norwegian and Swedish, definiteness is an agreement feature, so that noun phrases equivalent to those of (7e) and (7h) would be grammatical (see Börjars and Donohue (In press) for a further discussion of this difference within an OT setting).

This intuition can be straightforwardly captured if we assume a requirement that they contain functional information about the value of SPEC. This value, DEF or INDEF, can be contributed either by a definite noun or by a definite or indefinite syntactic determiner, as illustrated in (8).

(8) a.

```
        NP
        │
        N              ⎡ SPEC   def ⎤
        │              ⎢ ...        ⎥
      æblet            ⎣            ⎦
```

     b.

```
          NP
         ╱  ╲           ⎡ SPEC   def ⎤
        D    N          ⎢ ...        ⎥
        │    │          ⎣            ⎦
       det  æble
```

A further striking thing about the data in (7), particularly the difference between (7g) and (7i), is that, as long as we assume that the feature carried by the adjective is different from that carried by determiners and nouns, definiteness is always marked on the leftmost element.[6] However, the fact that positional criteria play a role in the exponence of definiteness within the noun phrase does not point in favour of a head-to-head movement analysis. Instead, we assume an Optimality Theoretic (OT) approach to LFG in which there is a highly ranked alignment constraint (9) in the Scandinavian languages which requires the left edge of the element marked for definiteness to be aligned with the left edge of the noun phrase.

(9) ALIGN (LEFT (IN)DEF, LEFT NP)

Our conclusion with respect to the Scandinavian data is then that an analysis in which features map directly from the morphology to f-structure captures the generalisations more straightforwardly than one involving the use of head-to-head movement type representations.

3   Hungarian Focus

Neutral sentences in Hungarian — that is those without the discourse functions TOP or FOC — are verb-initial and arguably flat, with complements and adverbials in free order (É.Kiss 1994). This is illustrated in (10a), with a range of possible variants in (10b-d):

(10) a. Meg-hívta   tegnap   Éva   Jánost   a   mozi-ba
        PERF-invite.PAST   yesterday   Éva   János.ACC   ART   cinema-ILL
     b. Meg-hívta Éva tegnap Jánost   a mozi-ba
     c. Meg-hívta tegnap Jánost   Éva   a mozi-ba
     d. Meg-hívta a mozi-ba Éva   Jánosttegnap
        'Éva invited János to the cinema yesterday.'

When a topic is present, such as *Éva* in (11), it occurs before the predicate, bears less stress than the initial element of the predicate, and can be either followed or preceded by sentential adverbials:

(11) a. Éva tegnap meg-hívta   Jánost   a   mozi-ba
        Éva   yesterday PERF-invite.PAST   János.ACC   ART   cinema-ILL
     b. Tegnap Éva meg-hívta Jánost   a mozi-ba
        'Éva yesterday invited János to the cinema.'

A subset of quantifier phrases, including universal quantifiers but not existential ones, obligatorily occurs to the left of the verb and following any topics or sentential adverbials:

(12) a. Éva tegnap mindenkit   meg-hívott   a   mozi-ba
   Éva yesterday everybody.ACC PERF-invite.PAST ART cinema-ILL
  b. *Mindenkit Éva tegnap   meg-hívott a mozi-ba
  c. *Éva mindenkit tegnap   meg-hívott a mozi-ba
  d. *Éva tegnap   meg-hívott mindenkit a mozi-ba
   'Éva yesterday invited everybody to the cinema.'

Hungarian has a designated focus position to the immediate left of the finite verb. We will refer to such focus positions as "internal focus", contrasting them with designated focus positions which are located closer to the periphery of the clause. In Hungarian, nothing can intervene between the focus and the verb-stem, including "preverbs" such as the perfective *meg*:

(13) a. Tegnap Éva JÁNOST hívta   meg a   mozi-ba
   yesterday Éva JÁNOS.ACC invite.PAST PERF ART cinema-ILL
  b. *Tegnap Éva JÁNOST   meg-hívta a mozi-ba
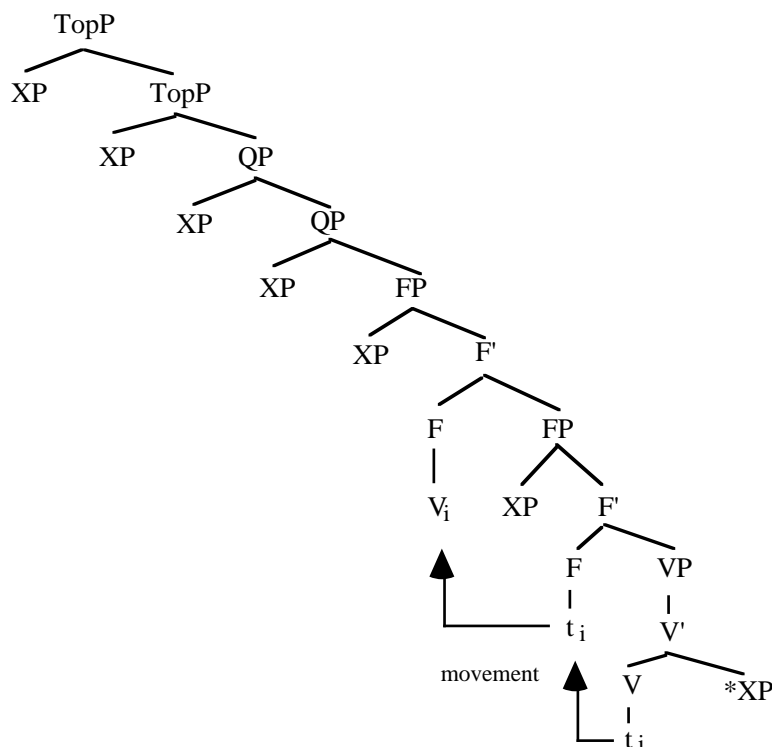   'It was JÁNOS who Éva yesterday invited to the cinema.'

Multiple focus is not permitted in the designated focus position, as shown in (14a), but is permitted if one focus is preverbal and the remainder are in-situ, as in (14b):

(14) a. *Tegnap   ÉVA CSAK JÁNOST hívta   meg a   mozi-ba
    yesterday ÉVA ONLY JÁNOS.ACC invite.PAST PERF ART cinema-ILL
  b. Tegnap ÉVA hívta meg CSAK JÁNOST a mozi-ba
   'Yesterday it was ÉVA who invited ONLY JÁNOS to the cinema.'

   The standard P&P analysis of this data set involves the postulation of at least one functional projection, typically Focus Phrase (FP), whose specifier position is occupied by the focussed constituent, and into whose head position the finite verb moves. In a recent version (É.Kiss 1998), there are recursive functional projections TopP (Topic Phrase), QP (Quantifier Phrase) and FP, and in the case of multiple focus, the verb moves into the highest F head:

(15)

TopP
XP   TopP
      XP   QP
            XP   QP
                  XP   FP
                        XP   F'
                              F   FP
                              |
                              V$_i$ XP   F'
                                             F   VP
                                             | |
                              movement   t$_i$ V'
                                                    V   *XP
                                                    |
                                                    t$_i$

To what extent could and should an LFG analysis utilise the same functional categories? We note first of all that the functional categories TopP and QP are invariably headless: there are no overt functional elements allowed by Specialization which fill the Top and Q positions, nor does any lexical category move into these positions. Such projections, we argue, should automatically be excluded under any interpretation of Economy of Expression.[7] FP by contrast might in principle be justified as long as the verb is treated as head of FP. However, there are both conceptual and empirical problems with this idea.

The conceptual problem rests in the fact that there is in Hungarian no grammatical instantiation of focus other than the adjacency of the focussed constituent to the verb: there is no independent functional category other than the "displaced" verb which can act as the head of FP. Why then should V be in F? P&P analyses standardly assume that this is because focus must be "assigned" by a head in an analogous manner to the assignment of Case. However, just as LFG does not need to "assign" case (nodes can simply be annotated with the relevant case schema), it does not need to "assign" focus. The parallelism between "case-assignment" and "focus-assignment" in the P&P framework is discussed in detail in Horváth (1995). As Horváth points out, particularly problematic for the FP hypothesis are languages like Aghem (see Watters 1979) in which the internal focus and object arguments are both to the right of the verb, with the focus rather than the object adjacent to the verb. This creates problems for the notion that the specifier position of a postulated FP represents the scope of focus, and Horvath ultimately abandons FP altogether for this reason.

Once the notion that movement takes place to enable focus-assignment is abandoned, it is not surprising that there are empirical difficulties with the V-in-F analysis in Hungarian. Firstly, the V-in-F analysis predicts that the position of preverbs following verb-movement is left-peripheral in VP. However, Farkas &Sadock (1989) cite examples like (16) in which the particle *fel* 'up' naturally follows the object *minket* 'us':

(16) MARI keresett minket fel (és nem Ilona)
      MARI look.PAST us up (and notIlona)
   'It was MARI who looked us up (and not Ilona).'

In order to account for this kind of example, Farkas & Sadock conclude that verb-particle inversion should be handled by a liberation rule which frees the particle to move amongst the post-verbal constituents. This liberation is subject to a stress constraint (Varga 1981): least stressed items like particles and pronouns tend to occur closer to the left. Secondly, the structural analysis of multiple focus predicts that the postverbal focus should immediately follow the verb. However, the postverbal focus can structurally occur to the right of other postverbal constituents (É.Kiss 1998:19):

(17) CSAK KET LÁNY olvasott el a vizsgára CSAK EGY KÖNYVET
      ONLY TWO GIRL read.PASTPERF exam.SUB ONLY ONE BOOK.ACC
      'ONLY TWO GIRLS read ONLY ONE BOOK for the exam.'

Rather than adopting the ad hoc structural movements proposed by É.Kiss (1998) to account for this, we follow Brody (1990) in assuming that the postverbal focus is interspersed amongst the postverbal constituents, but intonationally marked.

      Furthermore, we propose to handle the adjacency of the internal focus to the verb without the assumption of FP and a head-movement-mimicking analysis. An analysis which is quite compatible with the basic architecture of LFG is to allow the annotation $(\uparrow FOC) = \downarrow$ to be associated with VP-internal constituents, just like the argument annotation $(\uparrow OBJ) = \downarrow$:

(18)
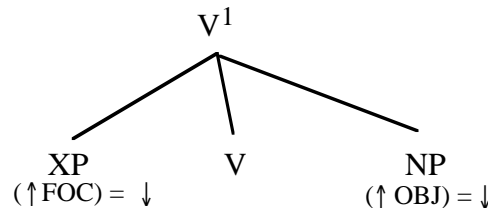
This captures the parallelism between case and focus without assuming that either must be assigned by a head. In order to capture the adjacency of the internal focus to the verb, we again suggest the adoption of OT-style alignment and linear precedence constraints. For concreteness, these are:

(19) a. ALIGN FOC = ALIGN (RIGHT FOC; LEFT V)
        b. HEAD FIRST = V < XP

ALIGN FOC requires the right edge of the focussed constituent to be aligned with the left edge of the verb. If there are two focus constituents, at least one must violate ALIGN FOC: there is therefore only one designated focus position. HEAD FIRST is a linear precedence constraint which is violated once for every constituent which occurs to the left of the verb. ALIGN FOC is ranked higher than HEAD FIRST: the designated focus position will automatically violate HEAD FIRST, but the ranking will allow one focussed constituent to precede the verb. If there are two focussed constituents, one will occur preverbally, satisfying ALIGN FOC. The other will violate ALIGN FOC wherever it is placed, but postverbal position will be preferred in order not to incur a violation of HEAD FIRST.

The assumption that discourse functions are not necessarily associated with the specifier positions of functional projections allows an analysis of Hungarian in which quantifier phrases and topics are positioned within an extended verbal projection, avoiding the postulation of functional projections without heads. This analysis is schematically represented in (20):

(20)
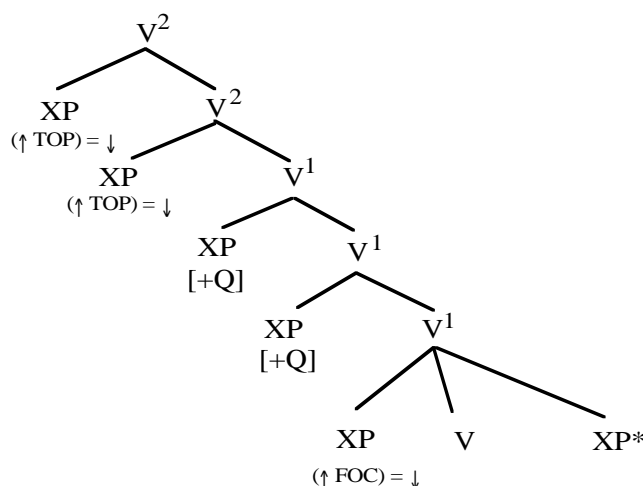
For a detailed analysis along similar lines, but not in LFG, see Payne & Chisarik (to appear).

4   Conclusion

These two case studies suggest that LFG phrase-structure principles might at the same time be too liberal (Specialization under one interpretation allows functional projections where alternative analyses consistent with the basic LFG architecture might be preferable), and too restrictive (Structure-Function Association requires functional projections wherever there are grammaticalised discourse functions). The direction in which the two case studies point is towards a restrictive view of Specialization in which only genuine functional categories head functional projections, and towards an account of the positioning of discourse functions and definiteness marking which relies on OT-style ordering constraints. Only detailed consideration of further cases will decide whether this is the best direction to follow.

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[1] We use Principles and Parameters to refer to recent versions of transformational theory such as Government and Binding and the Minimalist Program.

[2] Kroeger (1993:7) refers to an advanced syntax seminar held at Stanford by Joan Bresnan during the spring of 1991 for the original idea.

[3] For different views on the nature of m-structure, see Butt, Niño, and Segond (1996) and Frank and Zaenen (1998).

[4] We assume that a noun lacking the definite ending in the Mainland Scandinavian languages is not indefinite, but lacks any specification for definiteness. This position is argued for in Börjars (1998:166–8, 222–3).

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[5] We are also concerned that an analysis in which a D projects to DP would make the wrong predictions about the (im)possibility of modifying determiners (see Payne 1993).
[6] The feature marked on the adjective is traditionally referred to as WEAK in definite noun phrases and STRONG in indefinite environments. Given that a weak adjective cannot function as a full referential noun phrase on its own, under this approach, we can then assume that its feature is not the same as that for a definite noun (see Börjars 1998: 187–9).
[7] Identification of TopP with CP is not a good option, since complementizers in Hungarian precede topics (É.Kiss 1998). Identification of TopP with IP would in principle be possible, but, given CP and IP as the sole functional projections, would not leave any other functional projection to host focussed phrases.

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