Chapter 12

Noun phrases in LFG

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In this chapter we consider the analysis of noun phrases in LFG. As a preliminary, in Section 1 we go through a number of criteria that can be used to distinguish noun phrases from other phrase types. Degree of configurationality at clause level and its consequences for c-structure is a well-studied phenomenon in the LFG literature, and in Section 2 we evaluate how the conclusions drawn for clausal structure can be applied to noun phrases. In Section 3 we review the different approaches that have been taken to the functional structure and argument structure of noun phrases. In Section 4 we explore briefly how discourse functions may be expressed within the noun phrase.

1 Defining noun phrases

Before discussing the syntax of noun phrases, it is helpful to consider briefly the definition or delimitation of the category: how do we know what is and is not a noun phrase, and what are the essential properties of the class of noun phrases? In regard to most relevant phenomena in most languages, there is little difficulty in distinguishing a particular class of words which we label as "nouns" in distinction from verbs and other categories such as adjectives, adverbs, adpositions etc. We informally utilize different criteria in making these distinctions: the core meaning and basic function of the words, their morphology and the structure of the phrases they head. Some words, and some phrases, may be more problematic, however, aligning with our basic category of nouns in some respects, but

not in others. Moreover, if we want to talk about the properties and analysis of noun phrases crosslinguistically, we need to be clear about the criteria used for categorization, and to ensure that our criteria for categorization are applicable crosslinguistically.

According to Kornfilt & Whitman (2011: 1297–1298), approaches to categorizing phrases and words can be broadly divided into two types: "distributionalist" approaches define categories with exclusive reference to syntactic criteria, while "essentialist" approaches make use of nonsyntactic criteria, such as lexical semantics. Some approaches to categorization make use of both types of criteria; this is true, for example, of Baker's (2003) theory of syntactic categories.

Given the separation of syntax and semantics in the LFG architecture, "essentialist" criteria have relatively little weight in the definition of categories in LFG. As discussed by Lowe (2020), there are three types of "distributionalist" criteria commonly used for defining categories in LFG, by authors such as Spencer (2015) and Bresnan et al. (2016); we discuss each of these in turn.

The first type of criteria is the internal syntax of the phrase in question; that is, what sorts of words and phrases may appear together with the head inside the phrase in question. For example, we might say that noun phrases typically may contain determiners (in those languages that have them) and adjectives, while other types of phrase cannot contain these. There may also be differences in the configurational possibilities of different phrase types. For example, under some approaches to the phrase structure of English, noun phrases are the only lexical phrase type which contain a specifier (e.g. Dalrymple 2001); for others (e.g. Falk 2001b) no lexical phrases may contain specifiers, while functional phrases can. We discuss the phrasal structure of noun phrases in detail in Section 2.

Furthermore, there may be differences between phrases of different categories in terms of the grammatical functions which can appear with them, i.e. in terms of which grammatical functions a head of a particular category may or may not subcategorize for. Given the LFG architecture and the concept of structure-function mapping principles (Bresnan et al. 2016: 105, 117, see also Section 3), these issues are related to configurational differences between phrase types, but are not fully defined by them. For example, a grammatical function poss for the possessor in a noun phrase is often assumed, and sometimes contrasted with subj, such that poss may be a grammatical function exclusively associated with noun phrases, and subj a grammatical function exclusively associated with verb phrases. Similarly, it is widely assumed that nouns and adjectives do not, at least usually, subcategorize for obj (though see Mittendorf & Sadler 2008, Al Sharifi & Sadler 2009, and Vincent & Börjars 2010 for obj with adjectives and Lowe 2017 for

further discussion). We discuss grammatical functions within the noun phrase in detail in Section 3, and discourse functions within the noun phrase in Section 4.

The second type of criteria used for defining categories within LFG is the external syntax of the phrase in question (labelled "distribution" by Lowe 2020). This means that there are a certain set of positions within other phrase types where noun phrases may appear, and others where they may not. For example, in English, noun phrases may appear in the specifier of IP, in the complement position of VP and PP, but not in the complement position of AdjP or NP (though see references to OBJ with adjectives above).

The third type of criterion used for defining categories in LFG is the morphosyntax of the head of a phrase (or of the phrase itself): typically languages show differences between the morphosyntactic properties of, say, nouns, adjectives, and verbs. In many Indo-European languages, for example, nouns inflect for case and number, while verbs inflect for tense/aspect, person and number; adjectives inflect for case and number, but also inflect for gender, which is an inherent property of nouns.

The use of all three types of criteria is widespread in LFG approaches to categorization. Although each of the criteria can be problematic when applied in individual cases, in most cases the three types of criteria align unproblematically, such that it is relatively easy to distinguish broad categories of noun phrases, adjective phrases, verb phrases, etc. For example, while there are differences in the internal syntactic possibilities of noun phrases and verb phrases, there is also a degree of overlap: some noun phrases may be indistinguishable from verb phrases, purely in terms of their internal syntax. In such cases, however, external syntax and morphosyntactic criteria may help to distinguish noun phrases from verb phrases.

In rare cases there are serious mismatches between the criteria for categorization. This is perhaps most common in the case of noun-verb mixed categories: phrases which show properties of both noun and verb categorization. We avoid discussions of such mixed categories in this paper (for discussion see Lowe 2020), restricting ourselves to phrases which can (fairly) unambiguously be defined as purely noun phrases based on the sorts of criteria discussed above.

2 Configurationality and noun phrases

In this section we investigate the analysis of the surface configurational structure, the c-structure, of noun phrases in LFG. We consider how generalizations developed for degrees of configurationality at clausal level can be applied to noun
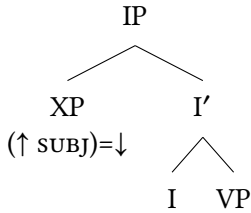
constituents and how these can be represented at c-structure (cf. Andrews 2023 [this volume]).

Abney (1987) changed the way in which noun phrases are analysed within mainstream generative approaches to syntax. Projecting functional categories at clausal level had been introduced in the work that led to the publication of Chomsky (1986), and Abney's work was intended as "a defense of the hypothesis that the noun phrase is headed by a *functional element* (…) D, identified with the determiner. In this way, the structure of the noun phrase parallels that of the sentence, which is headed by Infl(ection)" (Abney 1987: 3).
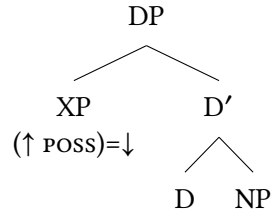
In this chapter, we will make comparisons between clausal and nominal constituents, but not with the aim of emphasizing parallels. Within LFG, the approaches to c-, f- and a-structure have been developed more on the basis of clausal structures than anything else, and we will explore the extent to which the resulting assumptions can be applied also to noun constituents. Our aim here is not to provide full analyses of any language, but to illustrate how a particular interpretation of a data set might be analysed in LFG.

Three levels of configurationality are generally distinguished within LFG at clausal level: configurational, illustrated in (1), part-configurational (3) and non-configurational (5), with S being an exocentric clause-level category (Andrews 2023 [this volume]). If we assume a corresponding exocentric category NOM for noun phrases, then we can set up the parallel noun phrase structures in (2), (4) and (6). Different combinations of these options may be motivated for different languages; for discussion see Nordlinger (1998) and Bresnan et al. (2016: 118–9). Specifiers of functional projections are assumed to be either syntactically prominent, illustrated here with subj and poss, or information-structurally prominent functions, here we have used df for discourse function (see Snijders 2015, Bresnan et al. 2016: 104–11 and Dalrymple et al. 2019: 121–6). As we will see in Section 3, functions such as subj and poss may be seen to have a dual role in this respect. We will return to what df may mean for noun phrases in Section 4. In (1) – (4), we have only annotated the specifier node, for information about annotations and how they work, see Belyaev 2023c: Section 4.2 [this volume] and Belyaev 2023a: Section 4.1 [this volume].
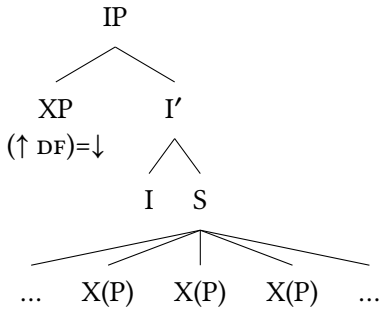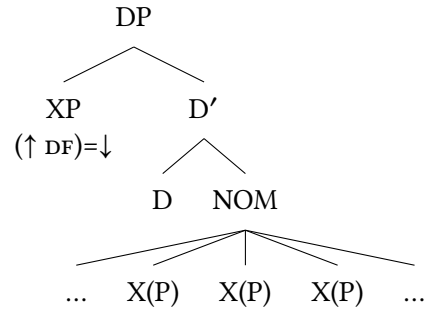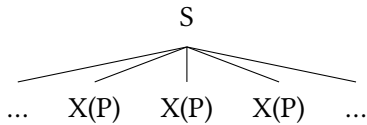
(1)

```
            IP
           /  \
         XP     I′
    (↑ SUBJ)=↓   /\
                I  VP
```

(2)

```
            DP
           /  \
         XP     D′
    (↑ POSS)=↓   /\
                D  NP
```

(3)

```
            IP
           /  \
         XP     I′
    (↑ DF)=↓    /\
               I  S
                /|||\
            ...  X(P) X(P) X(P) ...
```

(4)

```
            DP
           /  \
         XP     D′
    (↑ DF)=↓    /\
               D  NOM
                /|||\
            ...  X(P) X(P) X(P) ...
```

(5)

```
            S
         /|||\
     ...  X(P) X(P) X(P) ...
```

(6)

```
           NOM
         /|||\
     ...  X(P) X(P) X(P) ...
```

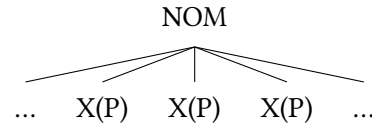## 2.1 Degrees of configurationality

Criteria commonly applied to strings to establish degrees of configurationality are (i) word order, (ii) capacity for discontinuity, and (iii) structural vs. non-structural determination of grammatical functions (for an excellent summary of arguments, see Nordlinger 1998).[1]

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[1] The concept of null anaphora is also called upon quite widely to justify a configurational analysis of languages like Warlpiri that are characterized by freedom of word order (see for instance Jelinek 1984, Hale 1993). This approach has been criticized by Austin & Bresnan (1996) for lacking empirical support when a broader set of languages is considered, and we will not consider this further here.

English is a language in which noun phrases display strict word order and relatively little discontinuity. Examples of discontinuity such as (7) are generally not taken to indicate non-configurationality, but are assumed to be due to a more general principle of extraposition due to weight. Noun phrase internal grammatical functions such as POSS are generally marked by structural position in English (though see Section 3 for more detailed discussion).

(7)   A *book* was published last year *on a new theory*.

English noun phrases can therefore be assumed to be thoroughly configurational and best represented by a tree such as (2), though we will return to the issue of functional categories in Section 2.2.

Turning now to the other end of the configurationality spectrum, for a number of languages which may at first sight appear to have non-configurational noun phrases, it has been argued that they do not in fact have noun phrases at all (see for instance Blake 1983). A string of elements that refer to the same referent – we will use the term NOMINAL STRING for these – whether continuous or not, may in some languages be best analysed as a number of independent nominal elements in apposition. In order to find a language with non-configurational noun phrases we must therefore first make sure that there is reason to assume that there are noun phrases in the language. Louagie & Verstraete (2016), in an evaluation of claims about non-configurationality in noun phrases in Australian languages, propose five criteria for establishing whether nominal strings form noun phrases: (i) contiguity, (ii) word order, (iii) diagnostic slots, (iv) phrasal case marking and (v) intonation.

Contiguity (i) is a necessary but not sufficient criterion; where the elements do occur together, they could still be assumed to occur in apposition, just as in the discontinuous examples. For our purposes, (relative) freedom of word order (ii) within a string for which there is other evidence of it forming a constituent will be taken as evidence of a flat structure. Some of the languages we will consider have an identifiable position (iii) at clausal level in which only a single constituent can occur, hence if a nominal string can occur in this position it can be assumed to form a structural unit. In a similar vein, if case is marked only once in a nominal string (iv), this string can be assumed to form a constituent. If a nominal string has a single intonation contour (v), it can be assumed to form a noun phrase (see also Schultze-Berndt & Simard 2012). The conclusion Louagie & Verstraete draw is that statements about the lack of noun phrase constituents in Australian languages have been overstated, but this is to some extent dependent on how they apply the criteria. For instance, whereas discontinuity has been

taken as evidence against constituency, they say that "the existence of discontinuous constructions is not invariably an argument against NP constituency" (2016: 28).

With respect to Warrongo (Pama-Nyungan), Louagie & Verstraete (2016: 35) conclude: "This is really the only type of language where flexibility provides evidence against constituency." This is based on the description by Tsunoda, who argues on the basis of evidence such as (8) that "the relative order of NP constituents is not fixed and it is difficult to generalize about it" (2011: 347).[2]

(8) Warrongo

    a. yarro-∅ gajarra-∅   ngali-ngo
         this-ACC possum-ACC 1DU-GEN
         'this possum of ours' (Tsunoda 2011: 348)

    b. yarro-∅ ngaygo gajarra-∅
         this-ACC 1SG.GEN possum-ACC
         'this possum of mine' (Tsunoda 2011: 348)

    c. yino   gornggal-∅   ngona-∅ nyon.gol-∅ jarribarra-∅
         2SG.GEN husband-ACC that-ACC one-ACC   good-ACC
         'that one good husband of yours' (Tsunoda 2011: 347)

    d. ngaygo yarro-∅ jarribara-∅ wobirri-∅
         1SG.GEN this-ACC good-ACC   English.bee-ACC
   'this nice English bee of mine' (Tsunoda 2011: 347)

Though nominal strings in Warrongo are generally contiguous, there are examples of discontinuity, as exemplified in (9).

(9) Warrongo

    a. yinda   **gagal-∅** wajo-ya **bori-∅**.
         2SG.ERG big-ACC burn-IMP fire-ACC
         'Make a big fire.' (Tsunoda 2011: 349)

    b. **gajarra-∅** nyola   ganyji-n   **goman-∅**.
         possum-ACC 3SG.ERG carry-NFUT another-ACC
         'She carried [i.e. brought] another possum.' (Tsunoda 2011: 349)

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[2]We use the Leipzig glossing rules also when these have not been used in the source of the example. For a number of glosses used in our sources, there is no equivalent in the Leipzig glossing rules, and we have maintained the original. This applies to the following: AN action nominal, DUB dubitative, EMPH emphatic, MIN minimal, POT potential, ONLY restrictive and SEQ sequential.

The examples in (8) and (9) show that each element of the nominal string is separately case marked, apart from the genitive possessor, regardless of whether the string is contiguous or not. Furthermore, with the exception of the genitive, the parts can each form an independent noun phrase. There is no diagnostic slot at clause level in Warrongo, and we do not have enough information about prosody to use that as evidence. Hence, based on the evidence available, we can assume that Warrongo is best analysed as a language where each part of a nominal string forms an independent nominal phrase, even when there is no discontinuity, so that in both (8) and (9), the individual words occur as daughters of a flat clausal structure. Though it is not our aim to provide a detailed analysis of Warrongo clause structure, our conclusions can be illustrated schematically as in (10) for (9b), where the case feature on the initial and final elements would ensure that they both become associated with OBJ in the associated f-structure (compare the analysis of Kalkatungu in Blake 1983).

(10)

```
                    S
        ┌───────┬───┴────┬───────┐
       NP      NP        V       NP
     [ACC ]  [ERG ]   [NFUT]   [ACC ]
```
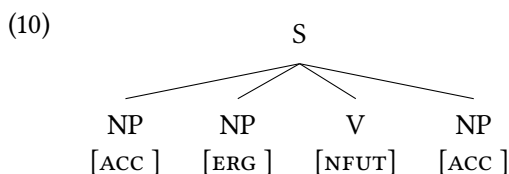
We turn now to Bilinarra (Pama-Nyungan), as described by Meakins & Nordlinger (2014). Discontinuous noun phrases are possible in Bilinarra, as illustrated in (11), and for these cases Meakins & Nordlinger (2014: 107–108) assume an analysis where each part forms a structurally independent constituent, in line with the conclusions drawn about Warrongo above.

(11) Bilinarra (Meakins & Nordlinger 2014: 108)
      Ngurra-nggurra=rna=rla ga-nggu, **ngayiny-jirri**, warrba=ma.
      house-ALL=1MIN.S=3OBL   take-POT 1MIN.DAT-ALL clothes=TOP
      'I'm going to take them to **the house**, to **my** (house), the clothes I mean.'

However, there is also evidence in Bilinarra that contiguous nominal strings do form constituents and hence can be NPs. Pronominal clitics, such as *yi* in (12), can occur in different positions in the clause, but most commonly occur in second position. When they do, they can be preceded by a word or a phrase. When a nominal string occurs in this pre-clitic position, as in (12a) it can be assumed to form a constituent. It should be added here that the clitic can also be preceded by just one word of a nominal string as illustrated in (12b), and in such cases Meakins & Nordlinger analyse all elements of the string as separate noun phrases in apposition.

(12) Bilinarra

    a. Ngayiny-ju=ma   ngamayi-lu=ma=**yi**   wanyja-rni
       1MIN.DAT-ERG=TOP mother-ERG=TOP=1MIN.OBJ leave-PST
       yabagaru=rni.
       small=ONLY
       'My mother left me as a child.' (Meakins & Nordlinger 2014: 102)

    b. Yalu-lu=**yi**   ngumbid-du ba-ni, garndi-lu.
       that-ERG=1MIN.OBJ man-ERG   hit-PST stick-ERG
       'That one, the man hit me with a stick.' (Meakins & Nordlinger 2014: 102)

Prosodic criteria are also used by Meakins & Nordlinger to identify a difference between strings that form noun phrases and strings that involve separate constituent parts in apposition. In (13a), the comma between *nyanuny-jirri* and *munuwu-yirri* indicates an intonational break and the possessor and the noun are assumed to form two phrases in apposition. In (13b), on the other hand, the two form part of the same prosodic unit and can be assumed to form a noun phrase constituent like they do in (12a). The resulting difference in meaning is captured by the idiomatic translations.

(13) Bilinarra (Meakins & Nordlinger 2014: 103)

    a. Jardila=ma   ya-n.gu=nga na, lurrbu na, **nyanuny-jirri**,
       tomorrow=TOP go-POT=DUB SEQ return SEQ 3MIN.DAT-ALL
       munuwu-yirri.
       home-ALL
       'Tomorrow she might go home **to hers**, **to home**.'

    b. Jardila=ma   ya-n.gu=nga na, lurrbu na, **nyanuny-jirri**
       tomorrow=TOP go-POT=DUB SEQ return SEQ 3MIN.DAT-ALL
       munuwu-yirri.
       home-ALL
       'Tomorrow she might go home **to her home**.'

We can then follow Meakins & Nordlinger and assume that nominal strings may form noun phrases in Bilinarra; when the string is contiguous, not interrupted by a pronominal clitic and forms one prosodic unit. On the assumption that there is no evidence in favour of a functional projection in Bilinarra (see Section 2.2), we can assume that a tree like that in (6) is appropriate for these noun phrases. For examples of other languages that warrant (partially) flat analyses of

noun phrases, see for instance Simpson (1991) on Warlpiri, Raza & Ahmed Khan (2011) on Urdu, Lowe (2015) on Old English, Börjars et al. (2016) on Old Icelandic and for constraints on discontinuity of Latin noun phrases see Snijders (2012).

2.2 Headedness of noun phrases

There were early suggestions in the literature that noun phrases may in fact be headed by determiners (see for instance Lyons 1977 and Hudson 1984) and a debate between Zwicky (1985) and Hudson (1987) attempted to establish criteria on the basis of which the issue could be settled. However, these criteria do not lead to an unambiguous empirical conclusion, but theoretical assumptions determine the choice. Generally, after Abney (1987) all noun phrases were assumed to be (at least) DPs within Chomskyan approaches, but more recently the suggestion has been made within this architecture that a DP may not be motivated for all noun phrases (Bošković 2008, 2012). LFG generally takes a more restrictive approach to functional categories; they are assumed when a functional feature is associated with a particular structural position (Kroeger 1993: 6, Börjars et al. 1999, Sadler 2000: 92, 108). LFG's universal principles of endocentric structure-function association also state that the specifier of a functional category hosts a DF (Bresnan et al. 2016: 105, 117, see also Section 3), so that if a DF can be found to be associated with a particular structural position, this can be used to argue in favour of a functional category (see Section 4 for further discussion). Only one functional category is generally assumed within noun phrases, though there are some language-specific exceptions, for instance as in the analysis of Welsh by Mittendorf & Sadler (2005) and Chinese by Börjars et al. (2018); for further examples, see Dalrymple et al. (2019: 102–103).[3]

There has not been much discussion in the LFG literature of the headedness of noun phrases. Bresnan et al. (2016) assume that English noun phrases are DPs, but without much motivation. Dalrymple (2001) analyses them as NPs, with determiners located in specifier of NP, and this is maintained in Dalrymple et al. "for simplicity" (2019: 101). NP analyses for English can also be found in Chisarik & Payne (2003), Arnold & Sadler (2014), and Lowe (2015).[4] Börjars et al. (2019) include a brief discussion of the issue and conclude that there is no unambiguous evidence either way in the case of English noun phrases, but analyse them as DPs on the basis of the definiteness feature being associated with the left edge.

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[3]Mittendorf & Sadler (2005) say explicitly "Determining the precise c-structure is not our main concern here."

[4]However, in Lowe (2015) an NP-internal possessor is a DP, and the '*s* is structure shared.

Sadler (2000: 92) argues explicitly for an NP analysis of Welsh on the basis of lack of evidence for a DP. POSS, which shares some properties with SUBJ and hence is a DF, occurs in the specifier position of NP in this analysis. However, Sadler points out in a footnote that "the discourse-oriented functions are canonically associated with specifier of functional categories" (2000: 97) and suggests an alternative DP analysis in which POSS is found in the specifier of DP position. Charters (2014: 211) also uses the role of the specifier of a functional category in determining the headedness of noun phrases: "These days a DP analysis is more generally assumed, is a "universal default" under the EMPs [Endocentric Mapping Principles] ...". We will return to Sadler's analysis in Section 3.4.

There are languages for which the marking of definiteness can be argued to provide clearer evidence of headedness. Consider the Amharic data in (14), from Kramer (2010: 197–199).

(14) Amharic

    a. bet=**u**
        house=DEF
        'the house' (Kramer 2010: 197)

    b. tɨllɨ=**u**   bet
        big=DEF house
        'the big house' (Kramer 2010: 198)

    c. bätam tɨllɨ=**u**   bet
        very   big=DEF house
        'the very big house' (Kramer 2010: 198)

    d. ɨʤʤɨg bätam tɨllɨ=**u**   bet
        really very   big=DEF house
        'the really very big house' (Kramer 2010: 198)

    e. lä-mist-u   tammaññ=**u** gäs'ä bahriy
        to-wife-his faithful=DEF character
        'the faithful-to-his-wife character' (Kramer 2010: 199)

    f. ɨbab yä-gäddäl-ä-**w**   lɨʤ
        snake COMP-kill.PFV-3M.SG=DEF boy
   'the boy who killed a snake' (Kramer 2010: 199)

Here we see that the definiteness marker attaches to the first constituent. The status of the definiteness marker is problematic.[5] The marker attaches to whatever word ends the first constituent, including nouns (14a), adjectives (14b–e) and finite verbs (14f). Following the arguments of Lowe (2016: 161), this freedom of attachment to in principle any word class suggests a clitic, an analysis also followed by Lyons (1999), and hence we have used = in the glossing. In that case, the definiteness marker is most naturally interpreted as a D head, with a specifier position preceding it. By the structure-function association principles, the specifier position would be expected to be able to house a DF, and this can indeed be argued to be the case in Amharic. In Amharic, possessors, which can be argued to have discourse-functional properties (see Section 3.2 for discussion), take the shape of a PP with the preposition *yä* as in (15), and are found in the pre-definiteness position.[6] The annotated tree is provided in (16).

(15)   Amharic
       yä=lɨʤ=**u**   däbtär
       of=boy=DEF notebook
       'the boy's notebook' (Kramer 2010: 202)

If we apply the argument based on the relation between free word order and a flat structure conversely, and assume that lack of flexibility of word order indicates a hierarchical structure, then the tree in (16) would be appropriate for Amharic. This is a version of the skeletal tree in (2). However, as we shall see in Section 4, word order may be fixed even in languages for which there is evidence in favour of a flat structure; this is unproblematic to analyse within LFG.

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[5]Kramer formulates her analysis within Distributed Morphology, where the distinction between affix and clitic is not directly relevant. In her analysis the element is found under D, with an indication that it is bound, but this is the case regardless of the nature of its prosodic and morphological dependency.

[6]As noted, the status of the definiteness marker is problematic, and besides the evidence for clitic status there is also evidence for affixal status, including the possibility for multiple definiteness marking: in noun phrases with more than one modifier, the first one is obligatorily marked, and any following modifiers are optionally marked (Kramer 2010: 202). Beermann & Ephrem (2007) assume affixal status within their HPSG analysis. Even if the definiteness marker is taken to be an affix, it still unambiguously marks the right edge of a constituent which can host a DF function, and thus represents a specifier position. Similar distribution of DEF can be found in Balkan languages and there are a range of analyses, in part dependent on the view of the morpho-syntactic status of DEF (e.g. Sadock 1991: 117–120, Halpern 1995: 153–157, Dimitrova-Vulchanova & Tomić 2009, Bermúdez-Otero & Payne 2011, Franks 2015). We will return to elements that display properties of both affix and clitic in Section 3.4.

(16)

DP
├── PP
│   (↑ POSS)=↓
│   └── yä-lɨʤ
└── D′
    ↑=↓
    ├── D
    │   ↑=↓
    │   │
    │   =u
    └── NP
        ↑=↓
        │
        däbtär
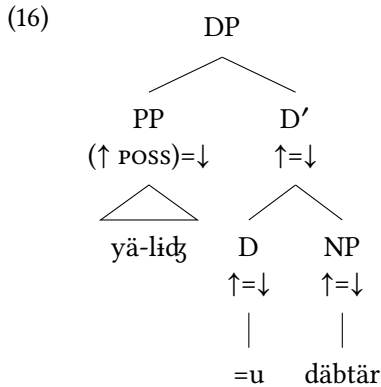
A DP analysis of noun phrases has been proposed also for Catalan (Alsina 2010),[7] Faroese (Börjars et al. 2016), German (Dipper 2005),[8] Hungarian (Laczkó 2007, 2017),[9] Low Saxon (Strunk 2005), Old English (Allen 2007) and Welsh (Mittendorf & Sadler 2005) (compare deP for Mandarin in Charters 2004). NP analyses have been proposed for Arabic (Al Sharifi & Sadler 2009), Chimane (Ritchie 2016), Hebrew (Falk 2001a, 2007, Spector 2009),[10] Hindi (Lee 2003), Hungarian (Chisarik & Payne 2001, 2003), Russian (King 1995), Swedish (Sells 2001), Tagalog (Kroeger 1993), Tz'utujil (Duncan 2003), Urdu (Bögel et al. 2008, Raza & Ahmed Khan 2011), Vedic (and other Early Indo-Aryan varieties) (Lowe 2017), Welsh (Sadler 2003, Mittendorf & Sadler 2008), and widely for Australian languages (e.g. Simpson 1991, Austin & Bresnan 1996, Nordlinger 1998 and many more). In many of these publications, establishing the structure and category status of the noun phrases is not the main issue, so that there are varying degrees of commitment to the structure assumed.

Complements of nouns are generally assumed to be the sister of N in c-structure, though as we shall see in Section 3.3.3, some argue that it is not possible to draw a clear structural distinction between complements and adjuncts. We will return to the f-structure feature of complements of nouns in Section 3.3. Modifying elements like APs or modifying PPs have the function ADJUNCT, and can be assumed to adjoin either at phrasal or X′ level (see Bresnan et al. 2016: 127, Butt et al. 1999: 105–114). In a DP analysis, they may attach either within the D spine or the N spine. Their position is established empirically, and there may be

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[7]This is an analysis within a lexical sharing approach.

[8]Note that Dipper has a flat structure under D′.

[9]Laczkó (2017: 250) comments: "when there is no need for a DP projection from an LFG perspective, I use the NP maximal projection".

[10]Though note that Falk (2001a) has a KP (case phrase) inside this NP.

arguments within a particular language for attaching different types of modifiers at different levels within the noun phrase.

3 Noun phrases, ɢꜰs and argument structure

In this section we review the different grammatical functions that have been used for noun phrases and the arguments for the different approaches. We also consider how the relevant aspects of the structure-function association principles apply within the noun phrase.

While there is in general a good understanding and broad agreement on how to identify and define the grammatical functions of arguments within verb phrases and clauses (Belyaev 2023b [this volume]), there are a variety of contrasting approaches to arguments within the noun phrase in LFG, and little sign of a developing consensus. We begin this discussion by considering the universal principles of endocentric structure-function association proposed by Bresnan et al. (2016: 105, 117):[11]

1. c-structure heads are f-structure heads;

2. complements of functional categories are f-structure coheads;

3. specifiers of functional categories are the grammatical discourse functions;

4. complements of lexical categories are nondiscourse argument functions or f-structure co-heads;

5. constituents adjoined to phrasal constituents are optionally nonargument functions.

These principles are fundamentally developed on the basis of, and exemplified using, verb phrases and clauses, but as universal principles of endocentric

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[11]In Dalrymple et al. (2019), some of these principles are modified slightly. Dalrymple et al. note that according to Laczkó (2014), Hungarian is an exception to Bresnan's claim that ꜱᴜʙᴊ cannot be the complement of a lexical category. Dalrymple et al. (2019: 121) further "propose that specifier positions are filled by phrases that are prominent either syntactically or in information-structural terms. …Syntactically prominent phrases that can appear in specifier positions in the clause are those bearing either the function ꜱᴜʙᴊ or the overlay function ᴅɪꜱ heading a long-distance dependency. Information-structurally prominent phrases can also appear in specifier position; if they are not syntactically prominent, they may bear any grammatical function within the local clause."

structure-function mapping, there is an implicit assumption that these principles should hold also for noun phrases. One explicit acknowledgement of the applicability of these principles to noun phrases is by Sadler (2000: 94), who notes that her proposed annotated c-structure rules for Welsh NPs are "fully consistent with the structure-function mapping principles for configurational languages proposed in Bresnan 2000 [2001]."

Based on the current state of research, it seems that noun phrases crosslinguistically do in fact tend to conform to the structure-function association principles (but see also Section 4). However, this still leaves a significant degree of flexibility in how grammatical functions within the noun phrase may be analysed, as discussed in the rest of this section.

3.1 Types of nouns involving possessors (in the broadest sense)

We can distinguish at least three broad categories of noun: common nouns (e.g. *dog*, *book*), relational nouns (e.g. *sister*, *friend*), and nouns derived from verbs (e.g. *arrival*, *destruction*, *playing* etc.). Common nouns can unproblematically, and commonly do, occur without any dependent argument or possessor phrase, though they can, of course, have possessors. Relational nouns differ in that they seem to entail the existence of an entity to which the referent of the noun bears the relevant relation; and this entity is regularly expressed as a possessor phrase within the relational noun phrase. There are different types of nouns derived from verbs, and it is not always easy to distinguish the different types crosslinguistically (see amongst others Comrie 1976; Grimshaw 1990; Koptjevskaja-Tamm 1993, 2002).

But in different ways and to different degrees, all nouns derived from verbs necessarily bear a relation to a lexeme which has an argument structure (i.e. the verb), and thus can or do entail the existence of other participants corresponding to the arguments of the base verb, and may also inherit some of the selection properties of the base verb.

In the case of nouns derived from verbs, questions of nominal argument structure intersect with questions of verbal argument structure, and so it is here that the theoretical implications of the similarities and/or differences between nominal and verbal argument structure are most significant (for verbal argument structure and its mapping to f-structure, see Findlay et al. 2023 [this volume]). Within LFG, this was first explored by Rappaport (2006 [1983]). In event nominalizations, for instance, noun phrases may contain two phrases that bear a grammatical relation in a way that closely parallels that of a corresponding clause:

(17)   a.   The sea water constantly hit the loose stones on the beach.

       b.   the sea water's constant hitting of the loose stones on the beach

But there are a wide variety of views on the necessary inheritance of verbal argument structure by derived nouns. At one extreme, Rappaport (2006 [1983]: 135) assumes that "in the unmarked case, a derived nominal inherits the argument structure of its related verb". At the other, Lowe (2017: 15) argues that a derived noun like *destruction* (in e.g. *the destruction of the city by the invaders*) has no syntactic or semantic arguments, the agent and patient relations of the prepositional dependents being "pragmatically inferrable". In between these two positions, Butt et al. (1999: 46) treat phrases like *of the city* and *by the invaders* as adjuncts (like Lowe) but assume there is a dependency relation between the head noun and its modifiers at the level of semantics.

A key element of this debate is the greater optionality of the arguments found with derived nominals, compared with the obligatoriness of the arguments of corresponding verbs. But there is crosslinguistic variation here: Laczkó (1995, 2000) shows that argument realization is obligatory for Hungarian complex event nominals, and he therefore naturally adopts an analysis involving full verbal argument structure inheritance by the derived nominals.

3.2 GFs used for primary arguments

Many languages have a special marking for what we will call the primary argument of a noun; this will often be a possessor, or may be a thematic argument in the case of nouns derived from verbs. Some languages have more than one means of marking the arguments of nouns, but if so there is usually one means of marking which is the more common and basic, and which is thus in a second sense the more primary means of marking arguments of nouns. In English, this primary marking is the so-called genitive or possessive *'s* marker. Much of the following discussion is based on the English possessive *'s*, but the principles apply more widely to primary markers of arguments of nouns in other languages.

There are three main approaches to the analysis of primary-marked possessors in noun phrases. The most common assumption is that such possessors fill the grammatical function POSS (e.g. Rappaport 2006 [1983], Sadler 2000, Falk 2001b, Bresnan 2001, Bresnan et al. 2016, Laczkó 2000, 2007, 2017, Strunk 2005, Charters 2014, Lowe 2017, Dalrymple et al. 2019). A few authors, including Williford (1998), Butt et al. (1999), and Dalrymple (2001), treat these possessors rather as SPEC. However, the function SPEC is also widely used for the function of determiners and/or quantifiers, and as noted by Sadler (2000) and Falk (2002) this is

problematic for languages in which determiners and possessors (e.g. Romanian) and/or quantifiers and possessors (e.g. English) can co-occur. On this basis Dalrymple et al. (2019: 83–84) argue that SPEC should be restricted to quantifiers; instead they use POSS for possessors and features such as DEF and DEIXIS for articles and demonstratives.[12]

Chisarik & Payne (2001, 2003) argue that primary possessors have the function SUBJ. The close relation between possessors and the SUBJ function is clear in the case of nouns derived from verbs (cf. 17), and is acknowledged also by some of those who treat possessors as POSS. For example, Sadler (2000: 106) defines POSS as a "SUBJective" function; similarly, Laczkó (2007: 358) refers to the "subject-like nature of the possessor". Like SUBJ, POSS includes discourse-functional properties, and may be associated with topicality (Rosenbach 2002); see further Section 4.

In some sense, POSS can be seen as the nominal equivalent of SUBJ, the most basic, most common, and semantically most variable verbal argument function. Yet there are important differences between the two. For example, expletives can fill SUBJ, but cannot be possessors in English:[13]

(18)   a.   There appears to be a reindeer on the roof.

        b.   * There's appearing to be a reindeer on the roof is an illusion.

(19)   a.   It appears that there's a reindeer on the roof.

        b.   ? Its appearing that there's a reindeer on the roof is an illusion.

SUBJ is generally assumed to be associated with specifier of IP, or to be morphologically marked as a SUBJ (or both); POSS is assumed to be associated with

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[12]It should be pointed out here that quantifiers have not been fully explored from a c-structure perspective. They are sometimes assumed to head a QP, but without detailed argumentation (e.g. Wescoat 2007, Bresnan et al. 2016: 211–212). A referee suggests that one reason form and function of quantifiers have not been so well-explored in LFG is that the distinction is either trivial or problematic for these elements. However, Dipper (2005) is an example of how the distinction can be made; she provides detailed argumentation that elements in German which function as quantifiers in fact belong to two different c-structure categories, some sharing properties with adjectives and some with determiners. Note that beyond LFG, Payne & Huddleston (2002) do distinguish between the category 'determinative', to which quantifiers belong, and the function "determiner". The semantics of quantifiers has been well explored in LFG; see Dalrymple et al. (2019: 302–312).

[13]The examples are taken from Bresnan et al. (2016: 315). A referee points out that the noun phrase status of the constituent built around *appearing* in (18b) and (19b) is controversial, and suggests that using *tend* and *tendency* in examples (18) and (19) would be more convincing.

a broad range of positions crosslinguistically.[14] The semantic relation between a poss and its possessum is considerably more flexible than that between a subj and its verbal head, and there does not appear to be a nominal equivalent of the Subject Condition (Findlay et al. 2023 [this volume]), for example.[15] Thus there does seem to be some justification for distinguishing subj from the grammatical function of possessors.

subj is a governable grammatical function, and so must be subcategorized for. The status of poss is arguable: some authors treat poss as an argument function, others as a non-argument function, and others as both. For Sadler (2000: 97), poss is a non-argument function for common nouns and an argument function for deverbal nouns, this is illustrated in (20).

(20) Welsh

    a. *llyfr*   N   'book⟨ ⟩(↑poss)' (common noun)

    b. *disgrifiad*   N   'description⟨(↑poss)⟩' (deverbal noun)

Bresnan et al. (2016: 315–319) assume a lexical predication template which converts nouns, including deverbal nouns, into predicates with an optional poss argument:[16]

(21) a. *horse*   N   (↑pred) = 'horse⟨ ⟩'
         'horse⟨ ⟩' ⟹ 'horse-of⟨(↑ poss)⟩'

    b. *singing*   N   (↑pred) = 'singing⟨(↑ obl_{of})⟩'
         'singing⟨(↑ obl_{of})⟩' ⟹ 'singing-of⟨(↑poss) (↑ obl_{of})⟩'

Laczkó (2007) proposes a slightly different lexical redundancy rule which converts a noun without argument structure into a one-place "raising" predicate, and a relational noun to an "equi" predicate:[17]

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[14]Charters (2014: 209) sums up: "Possessors have been said to occur in Spec NP (Sadler 2000, Charters 2004, Laczkó 2007, Lødrup 2011); Spec DP/FP (Charters 2004, Strunk 2005); adjoined to NP (Chisarik & Payne 2001); adjoined to N (Lødrup 2011), and in the complement of N (Chisarik & Payne 2001)."

[15]In fact, arguments of nouns are rarely obligatory, with only a few possible exceptions in English (like *behalf* and *sake*). To account for the obligatory realization of arguments with complex event nominals in Hungarian, Laczkó (1995) proposes a nominal equivalent to the subject condition, namely the "poss condition".

[16]Similarities and differences between poss and subj are referred to but poss is not classified with respect to argument or discourse function. For verbal gerunds like *Mary's frequently visiting Fred* poss is equated to subj.

[17]The templates used by both Bresnan and Laczkó have the effect of adding an optional argument. For an alternative way of capturing the optionality of arguments of nouns, see Lowe (2017: 293–294) with reference to Asudeh & Giorgolo (2012), Giorgolo & Asudeh (2012), and Asudeh et al. (2014).

(22) Hungarian

    a. *kalap₁*   N   'HAT⟨ ⟩' ⟹
        kalap₂   N   'HAT⟨(↑XCOMP)⟩(↑POSS)'
                        (↑POSS) = (↑XCOMP POSS)

    b. *húg₁*   N   'YOUNGER-SISTER-OF⟨θ⟩' ⟹
        húg₂   N   'YOUNGER-SISTER-OF⟨(↑POSS)(↑XCOMP)⟩'
                        (↑POSS) = (↑XCOMP POSS)

Payne et al. (2013: 804–805) argue that no clear distinction can be drawn between inherently relational and non-relational nouns, they propose to treat all nouns grammatically as nonrelational until combined with a dependent.

3.3 Secondary argument marking

In many languages the primary means of marking a possessor or other argument of a noun can only mark one such argument, and there is a secondary means of marking arguments which can be used alongside, or sometimes instead of, the primary marking. This is not the case in all languages, for example in Estonian the genitive case is the primary means of marking possession, but two arguments of a noun can be marked in the genitive:

(23)   Estonian (Koptjevskaja-Tamm 2002: 732)

    a. Jaan-i   Inglisma-a   kaart
        Jan-GEN.SG England-GEN.SG map.NOM.SG
        'Jan's map of England'

    b. Peetr-i   maja-de   ehita-mine
        Peter-GEN.SG house-GEN.PL build-AN.NOM.SG
        'Peter's building (of) houses'

In contrast, in English, as illustrated by the translations above, any second argument of a noun must be expressed by means of a prepositional phrase, and this can also be the case for single arguments of a noun. This can include possessors, marked in English with *of*.

The grammatical function of such secondary argument phrases, such as English *of* possessors, is also a matter of debate. Such possessors are sometimes treated as ADJ, e.g. by Butt et al. (1999), Sadler (2000), and Lowe (2017), sometimes as an OBL_OF, e.g. by Rappaport (2006 [1983]) and Bresnan et al. (2016).[18] We consider the major grammatical functions associated with secondary argument marking in the following subsections.

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[18]Laczkó (1995) permits English *of* possessors to realize either OBL_θ or POSS.

3.3.1 Secondary argument marking and OBJ

It is significant that while the close relation between POSS and SUBJ is widely recognized, and the two are sometimes conflated, a clear distinction is always maintained between secondarily marked possessor phrases and the OBJ function, despite, for example, the positional similarity between *of* possessors and objects (as seen in (17)). It is taken as a strong, if not definitional, generalization, that nouns cannot take OBJ (Bresnan & Kanerva 1989, Bresnan & Moshi 1990, Bresnan & Mugane 2006, Chisarik & Payne 2001, 2003, Lowe 2017, 2020). Lowe (2017, 2020) argues that noun phrases which appear to include object dependents are in fact mixed projections, incorporating a verbal projection which licenses the object.

Chisarik & Payne (2001, 2003) propose a specialized nominal argument function NCOMP/ADNOM, which is intended to capture the relevant similarities between the secondary possessor function and OBJ, while keeping them distinct. In argument structure terms, NCOMP is, like SUBJ and OBJ, an unrestricted function $[-r]$. Like SUBJ and unlike OBJ, however, NCOMP is also $[-o]$ (for an explanation of these features, see Findlay et al. 2023 [this volume]).

As with POSS and SUBJ, secondarily marked possessors are considerably less semantically restricted than any corresponding verbal argument function (including OBJ). For example, secondarily marked possessors differ from clausal OBJ in that they can be mapped to Agent:

(24) a. the love of a good woman
    b. the poor performance of the team

Moreover, primary and secondary possessors are unrestricted to different degrees. Payne & Huddleston (2002: 473–478) argue that the set of semantic relationships that can be expressed by an *of*-phrase in English is a proper superset of those that can be expressed by an *'s* phrase. For example, genitive POSS has to be affected: **history's knowledge* vs. *knowledge of history*. The following examples, from Payne et al. (2013: 809), illustrate how widely the relation between a prepositional possessor and its head can (and must) be interpreted in English.

(25) a. David Peace's Red Riding Quartet, which spins a fictional plot alongside **the murders of the Yorkshire Ripper**, is all the more potent for its true crime background.
    b. One of two sisters who bombed the Old Bailey in the 1970s is in custody today being questioned about **the murders of two soldiers** in Northern Ireland in March.

   c.   Paul Temple is part of the era between **the upper class murders of Agatha Christie** and **the gritty murders of today**.

   d.   The driving rhythms of London's fiercely competitive cat-walks may seem a thousand miles away from **the cosy cottage murders of Miss Marple**, but they provide a perfect environment for the more chilling edge of Agatha Christie's short stories.

3.3.2 Secondary argument marking and ADJ

Sadler (2000: 94) claims that "there are several reasons for believing that PP dependents of nouns do not map to complement functions". She analyses PP dependents of nouns in Welsh as ADJ because they show relatively free word order with respect to each other, but are fixed with respect to a possessor DP/NP (2000: 94–97). The argument to some extent works also for English; in the following examples, the *of*-possessor phrase follows an optional *by*-phrase, even when the latter is heavy, as in (26b).[19]

(26) a.   the description by the victims of their attacker

       b.   the description by the surgeon, Sir Zachary Cope, author of a highly regarded monograph on the early diagnosis of the acute abdomen, of his own experience with cholecystitis

3.3.3 Secondary argument marking and OBL

Rather than ADJ, Rappaport (2006 [1983]: 135–136) considers OBL_θ to be the best analysis of postnominal preposition phrases in English, on the grounds that postnominal noun phrases always "appear as the object of a preposition which reflects its thematic role." Possessive *of*-phrases are assumed to be $\text{OBL}_{\text{THEME}}$ explaining the restriction on *of*-phrases with some deverbal nouns:

(27) a.   Randy instructed Deborah to meet him at two.

       b. * Randy's instruction of Deborah to meet him at two

       c.   Randy's instructions to Deborah to meet him at two

(28) a.   John fled the city.

       b. * John's flight of the city

       c.   John's flight from the city

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[19]The example in (26b) is taken from Flegel (2002: 1379).

(29) *the destruction of the Romans (with *the Romans* as Agent)

Another argument in favour of OBL$_\theta$ over ADJ is the treatment of deverbal nouns from verbs like *put* which subcategorize for both OBJ and OBL$_\theta$. If the verb *put* requires SUBJ, OBJ and OBL$_{LOC}$, does the gerund *putting* require POSS, OBL$_{LOC}$ and ADJ? Given that the semantic restrictions on the locational phrase remain in the deverbal noun phrase, OBL$_{LOC}$ seems reasonable; but then it seems odd to assume that the OBJ of the verb is demoted to ADJ, moving below the OBL$_{LOC}$ argument on the grammatical function hierarchy (Belyaev 2023b [this volume]). It would mean that in examples such (30), the ADJ would naturally precede a subcategorized OBL.[20]

(30) a. All right, Republicans are denouncing President Donald Trump because of his apparent defense of Russian President Vladimir Putin and **his putting of the United States and Putin's Kremlin on moral equivalent grounds**.

  b. her constant placing of the Hills on a pedestal

On the other hand, Payne et al. (2013: 795) argue that "the empirical facts show the distinction between complements and modifiers of nouns to be unfounded. There is no rational way to motivate drawing the distinction between them… We assume no structural differentiation of the phrases formerly classified as either complements or adjuncts: all nouns are treated grammatically as nonrelational until they combine with a dependent." Payne et al.'s analysis is not formalized within LFG, but correlates with recent LFG work by Przepiórkowski (2016, 2017), who argues against the argument vs. adjunct distinction. If this is accepted, the OBL$_\theta$ vs. ADJ question with respect to noun phrase dependents is moot.

In some languages, the distribution of primary and secondary argument marking differs from the patterns seen above in English. As shown by Laczkó (1995, 2000; see also Laczkó 2007, 2017), event nominalizations in Hungarian require the theme argument to be expressed as either a dative or a nominative possessor, whereas the agent must be treated as an adjectivalized postpositional modifier. There is therefore no mapping in Hungarian equivalent to the mapping involved in the English *Edith's smashing of the vase*.

For Laczkó (2000), the Hungarian linking pattern for event nominals is essentially ergative: the SUBJ of an intransitive event nominal and the OBJ of a tran-

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[20]The examples in (30a) and (30b) are from http://edition.cnn.com/TRANSCRIPTS/1702/06/nday.06.html (accessed 6 July 2021) and https://www.goodreads.com/review/show/1326602940 (accessed 6 July 2019), respectively.
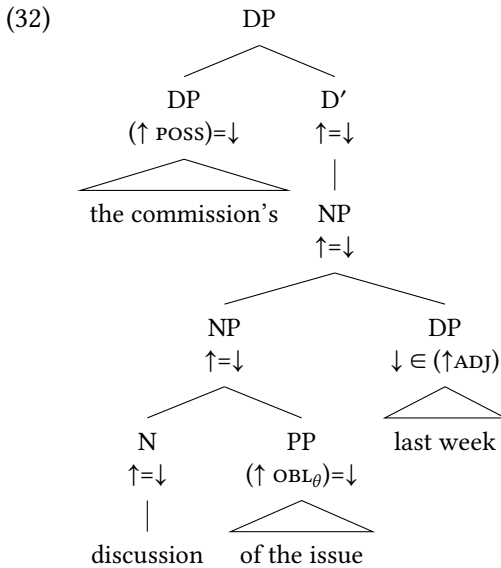
sitive event nominal are mapped to POSS, while the SUBJ of a transitive event nominal is mapped to a *by*-phrase.

3.4 Sample analyses

It will have become clear from Section 3.2 and Section 3.3 that there are different views on what grammatical functions are available within the noun phrase and what their positions are within the c-structure. Here we will illustrate with two analyses of English noun phrases based on different assumptions, and one of Welsh, which shows interestingly different properties.

Based on some of the assumptions with respect to c-structure and noun-phrase internal grammatical functions, we would get the annotated tree in (32) for the noun phrase in (31), with the associated f-structure in (33), where we have simplified the PRED values for the OBL$_{\text{OF}}$ and the ADJ.

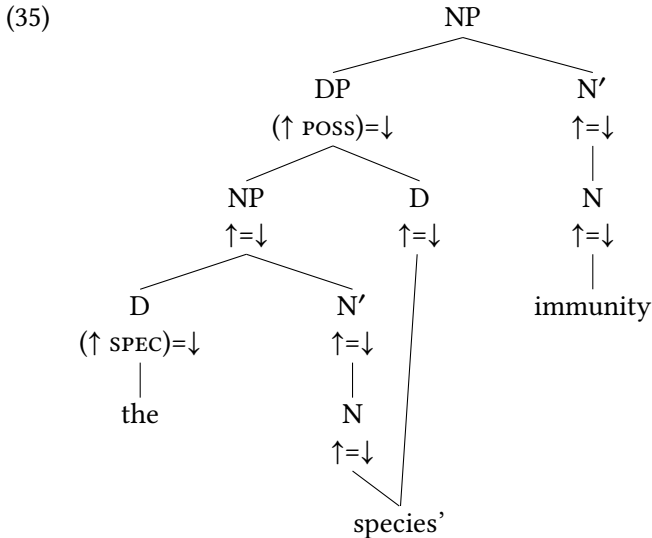(31)   the commission's discussion of the issue last week

(32)

```
                        DP
                  ┌──────────┐
                 DP          D′
            (↑ POSS)=↓       ↑=↓
           ┌───────────┐      │
        the commission's     NP
                             ↑=↓
                     ┌────────────────┐
                    NP                DP
                    ↑=↓          ↓ ∈ (↑ADJ)
              ┌──────────┐      ┌──────────┐
             N          PP       last week
             ↑=↓    (↑ OBL_θ)=↓
              │       ┌──────────┐
         discussion   of the issue
```

(33)
$$
\begin{bmatrix}
\text{PRED} & \text{`DISCUSSION}\langle(\text{POSS}), \text{OBL}_{\text{OF}}\rangle\text{'} \\
\text{OBL}_{\text{OF}} & \begin{bmatrix} \text{PRED `ISSUE'} \end{bmatrix} \\
\text{POSS} & \begin{bmatrix} \text{PRED `COMMISSION'} \\ \text{DEF} & + \end{bmatrix} \\
\text{ADJ} & \left\{ \begin{bmatrix} \text{PRED `LAST WEEK'} \end{bmatrix} \right\}
\end{bmatrix}
$$

In (32) and (33) we have opted to use the functions poss and obl$_\theta$ for the primary and secondary arguments, respectively, and assumed that these are optional arguments of *discussion*. With respect to c-structure, we have assumed that a distinction in attachment can be made between the complement *of the issue* and the adjunct *last week*, though we recognise that the arguments for this distinction are by no means unambiguous. There is no determiner element present in this analysis and hence the head of the DP is eliminated by what is generally referred to as the Principle of Economy of Expression (see Belyaev 2023a [this volume] for a summary, for different versions, see Bresnan et al. 2016: 90–2 and Toivonen 2003, and for a critical discussion see Dalrymple et al. (2015)). An alternative, if *'s* is analysed as a clitic, is to assume that it fills the D position (cf. similar assumptions for the Amharic definiteness marker in (16)), and this could then also account for the complementary distribution between the determiner and the poss. However, Lowe (2016) provides arguments against this type of analysis and instead provides a lexical sharing analysis in which *'s* can be analysed as both an affix and a clitic. The lexical sharing analysis makes use of the dimension representing the string of words, the s-string, which is mapped to the hierarchical c-structure. Under certain circumstances, one element in the s-string can be associated with two nodes in the c-structure, and in this case *'s* is mapped both to the N and the D head of the possessor. In this analysis, though possessors are of category DP, non-possessor noun phrases are assumed to be of the category NP, where the specifier position can be filled either by a non-projecting D (represented as $\hat{\text{D}}$ in LFG) (Belyaev 2023a: Section 2.1 [this volume]), or by a possessor DP, thereby accounting for the complementarity of possessors and determiners. The analysis is best demonstrated with an example where there is evidence of affix status, for instance where the *'s* is unexpressed because some property of the final word of the phrase it attaches to, as in (34), where *species* has the irregular "possessive" form *species'*. The annotated tree capturing the lexical sharing analysis is found in (35).

(34)   the species' immunity

(35)

```
                              NP
                    ┌──────────┴──────────┐
                   DP                     N′
                (↑ POSS)=↓               ↑=↓
            ┌──────┴──────┐               │
           NP             D               N
           ↑=↓           ↑=↓             ↑=↓
       ┌────┴────┐        │               │
       D         N′       │           immunity
   (↑ SPEC)=↓   ↑=↓       │
       │         │        │
      the        N        │
               ↑=↓        │
                │         │
              species'
```

Sadler (2000) provides an LFG analysis of Welsh noun phrases that she contrasts with the head movement analysis proposed by Rouveret (1994). Sadler assumes an NP structure, with the function POSS found in the specifier of NP position.[21] This analysis captures the complementarity of a possessor and the definite determiner, which is a property also of Welsh, and it accounts for the definiteness of the noun phrase as a whole. The definiteness of a noun phrase containing a possessor is determined by the presence of the definite article *y(r)* within the possessor, and if there are nested possessors, within the most deeply embedded possessor. The complementarity is assumed to be a property of the definite article. The first equation in the lexical entry in (36) captures the complementarity and the second the definiteness feature.

(36)   y(r) *'the'*   ¬ (↑ POSS)
                     (↑ DEF) = +

Consider the noun phrase in (37), where we have three layered possessors (note that 'bank' in 'bank manager' is realized as a possessor in Welsh).

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[21]Note that Sadler (2000: 97, fn 17) points out that if one accepts the claim that discourse-oriented functions such as POSS are found in the specifier of a functional category, then a DP analysis of Welsh noun phrases would be appropriate, but states that the analysis developed in the paper can be recast in a DP structure.
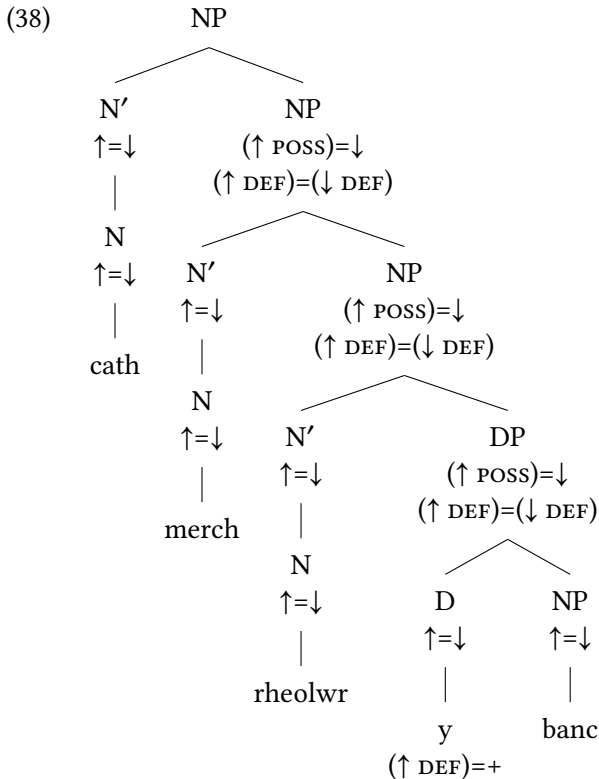
(37) Welsh

cath merch   rheolwr y   banc
cat   daughter manager the bank
'the bank manager's daughter's cat'

The annotated c-structure tree assumed by Sadler (2000: 101) and the associated f-structure can be found in (38) and (39). Here we see how a possessor is annotated as sharing its DEF feature with its daughter, ensuring that the definiteness of the most deeply embedded possessor determines the definiteness of the noun phrase as a whole. In (39), we also see illustrated the difference in argument status of POSS between common (*cat* and *manager*) and relational (*daughter*) nouns illustrated for common and deverbal nouns in (20).

(38)

```
                    NP
              ╱           ╲
          N'               NP
          ↑=↓           (↑ POSS)=↓
           │            (↑ DEF)=(↓ DEF)
          N            ╱           ╲
         ↑=↓        N'               NP
          │        ↑=↓           (↑ POSS)=↓
         cath       │            (↑ DEF)=(↓ DEF)
                   N            ╱           ╲
                  ↑=↓        N'               DP
                   │        ↑=↓           (↑ POSS)=↓
                 merch       │            (↑ DEF)=(↓ DEF)
                            N            ╱        ╲
                           ↑=↓         D            NP
                            │         ↑=↓          ↑=↓
                         rheolwr       │            │
                                       y           banc
                                  (↑ DEF)=+
```

(39)
$$
\begin{bmatrix}
\text{PRED} & \text{`CAT}\langle\ \rangle(\uparrow \text{POSS})\text{'} \\
\text{DEF} & + \\
\text{POSS} & \begin{bmatrix}
\text{PRED} & \text{`DAUGHTER}\langle(\uparrow \text{POSS})\rangle\text{'} \\
\text{DEF} & + \\
\text{POSS} & \begin{bmatrix}
\text{PRED} & \text{`MANAGER}\langle\ \rangle(\uparrow \text{POSS})\text{'} \\
\text{DEF} & + \\
\text{POSS} & \begin{bmatrix} \text{PRED} & \text{`BANK'} \\ \text{DEF} & + \end{bmatrix}
\end{bmatrix}
\end{bmatrix}
\end{bmatrix}
$$

4 Noun phrases and "discourse functions"

In Section 3, we referred to the principle of structure-function association, which states that the specifier of functional categories houses discourse functions. This does not, of course mean that this is the only position where DFs can occur (see for instance Laczkó 2014, who provides evidence for a DF in the specifier of VP for Hungarian). Though noun phrases are unlikely to allow the same range of grammatical discourse functions as clausal constituents, languages may have positions reserved for emphasis or contrastive focus within the noun phrase, and in what follows we will use DF in its broadest sense as any information-structurally marked position (Zaenen 2023 [this volume]).

Babungo (Grassfields, Benue-Congo) has radically head-initial noun phrases. The examples in (40) illustrate this for a range of elements.[22]

(40)   Babungo

   a. ká   wî
       money that
       'that money' (Schaub 1985: 73)

   b. yílwáŋ   têe
       hammers five
       'five hammers' (Schaub 1985: 74)

   c. ŋgá   kwàlə̀
       antelope big
       'a big antelope' (Schaub 1985: 72)

   d. tə́sàw tə́
       pipes your
       'your pipes' (Schaub 1985: 72)

---

[22]PST2 and PST4 refer to different past tense markers.

   e.   ghɨ́ ˈwée
       loaf child
       'the loaf of the child' (Schaub 1985: 76)

   f.   wěembwā fáŋ   tǐi   wi sɨ́   sáŋ   (ŋwə́)
       child   who father his PST2 beat.PFV him
       'a child whom his father had beaten' (Schaub 1985: 34)

   g.   shúu   ŋìi   wúumbǎ wī
       mouth house friend   his
       'the door of his friend's house' (Schaub 1985: 76)

Babungo has a number of elements indicating emphasis. The elements *ŋkèe* and *shè*ˈ, which can be associated with noun phrases as in (41), are described as emphasis adverbials. However, since these can also modify PPs, A(P)s and Adv(P)s, we can assume they are external to the noun phrase.

(41)   Babungo

   a. ŋkèe ŋkáw kāŋ
      very chair my
      'my own chair' (Schaub 1985: 74)

   b. shèˈ ŋkáw kə́bwə̄
      only chair bad
      'only a bad chair' (Schaub 1985: 74)

More relevant to our exploration of DFs within the noun phrase are the emphatic forms of possessors and demonstratives, which precede the noun, as illustrated in (42).[23]

(42)   Babungo

   a. yíŋkíi   tī
      that.EMPH tree
      'that particular tree' (Schaub 1985: 73)

   b. ntɨ̌ɨ   tə́sáw
      your.EMPH pipes
      'your own pipes' (Schaub 1985: 73)

There is also a negation focus element *tǔu*, which may precede the head noun as in (43).

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[23]Emphatic demonstratives may also follow the noun (Schaub 1985: 73).

(43) Babungo

    a. tǔu wɜ̀   mù' (nè kée lùu shɔ́ mē)
       even person one PST4 NEG be there NEG
       'Not even one person was there.' (Schaub 1985: 75)

    b. (ŋwɜ́ nɜ̀   kée kɜ̀)   tǔu fá   (shée mē)
       he   PST4 NEG give.PFV even thing to.me NEG
       'He didn't give me anything at all.' (Schaub 1985: 75)

As shown in (44), the emphasis adverbials, which we hypothesize occur outside the noun phrase, can co-occur with emphatic possessors and demonstratives.

(44) Babungo

    a. shè' yíŋkíi   ŋkáw
       only that.EMPH chair
       'only that particular chair' (Schaub 1985: 77)

    b. shè' ŋkǎŋ   ŋkáw kî
       only my.EMPH chair that
       'only that chair which is mine' (Schaub 1985: 77)

An unfocused demonstrative and an unfocused possessor can co-occur (45a), as can an focused possessive and an unfocused demonstrative (45b).

(45) Babungo

    a. ŋkáw kāŋ kî
       chair my that
       'that chair of mine' (Schaub 1985: 77)

    b. ŋkǎŋ   ŋkáw kî
       my.EMPH chair that
       'that chair which is mine' (Schaub 1985: 77)

However, an emphatic demonstrative and an emphatic possessive cannot co-occur.[24] Similarly, the emphatic negative *tǔu* cannot co-occur with either the emphatic demonstrative or the emphatic possessive. The examples in (44) indicate that there is no general restriction on two emphatic elements being associated with the same noun phrase, so we can assume that the constraint that rules

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[24]Emphatic demonstratives cannot co-occur with any possessor.

out the co-occurrence of the emphatic demonstrative and the emphatic possessive or *tŭu* is a noun phrase internal structural constraint. In other words, there appears to be one unique dedicated information-structurally privileged position within the noun phrase. By structure-function mapping, we might expect this to be the specifier of a functional projection, and hence for the tree in (2) or (4) to be appropriate. However, there is no other obvious evidence of a functional projection. There is no article in Babungo; there is what is described as an "anaphoric demonstrative adjective"(Schaub 1985: 97), but its position would not be taken as evidence of it being a projecting D. Babungo has a strict ordering within the noun phrase: Head noun > A > Poss > Nom > Dem > Q > PP > RelC (Schaub 1985: 77), but no evidence of a hierarchical structure.[25] Since freedom of word order is generally taken as one piece of evidence in favour of a flat structure, in Section 2.2 we referred to the possibility of using the criterion conversely, to assume that strict word may indicate a hierarchical structure. However, the interpretation of the Babungo data that we have argued for here indicates that word order can be strict even when there is no other evidence of hierarchical structure. Such non-hierarchical ordering restrictions can be accounted for within LFG by means of LINEAR PRECEDENCE RULES (Dalrymple et al. 2019: 144–145). However, this is not something that has been extensively explored in the LFG literature. Interestingly, in contrast to Babungo, which is head-initial and can be argued to have an initial information-structurally priviliged position, Ingush (Northeast Caucasian) has consistently head-final noun phrases and has an information-structurally privileged post-nominal position (Nichols 2011), so in a sense provides a mirror image of Babungo.

We see evidence, then, that noun phrases in different languages may include positions specifically associated with discourse-function marking. However, such positions need not be specifiers of functional projections, but may instead be specifiers of lexical projections (parallel to Laczkó's DF specifier of VP in Hungarian). Relatively little work has been done on discourse-function marking within the noun phrase, however, and more work is needed to establish the patterns and constraints on this cross-linguistically.[26]

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[25]The only exceptions involve obligatory possession (inalienable and kinship), which occur between the head noun and the A .

[26]Authors who do consider the dimension of discourse structure within the noun phrase include Charters (2014) and Chisarik & Payne (2001, 2003).

5 Conclusion

In this chapter, we have explored aspects of the analysis of noun phrases in LFG. Relatively little work has been done within LFG on the c-structure of noun phrases, though there are some notable exceptions, to which we have referred in this chapter. Degrees of configurationality at clause level and how to analyse them has, however, been a focus of much LFG work. Therefore, in Section 2, we considered how these analyses could be transferred to noun phrases. We argued that examples can be found of strictly configurational, partly configurational and non-configurational noun phrases, so that the c-structure analyses of the three global levels of configurationality developed at clause level can be carried over to noun phrases. In Section 2.2 we also considered the use of functional categories in the noun phrase in light of the restricted approach generally taken to such categories within LFG.

The role of argument structure and grammatical functions within noun phrases is, on the other hand, well-studied within LFG. However, there is no consensus on which GFs are relevant within noun phrases, or how the arguments of nouns relate to those of verbs. In Section 3, we reviewed and evaluated a number of proposals from the literature. We also considered how principles of endocentric structure-function association (Bresnan et al. 2016: 105, 117) apply to the relation between grammatical functions and structure in noun phrases.

Though noun phrases are unlikely to involve the same range of information structural notions as clauses do, basic notions such as emphasis and contrast do apply. In Section 4, we argued that there are languages that have a position for a basic grammaticalized discourse function within the noun phrase. In the languages we considered, this is a position at the edge of the noun phrase, preceding the head in a head-initial language (Babungo) and following the head in a head-final language (Ingush). However, our consideration has been relatively superficial and the noun phrases of these languages deserve further consideration.

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