Two issues in the syntax of Welsh noun phrases: an LFG approach*

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Abstract

Sadler (1997)a presents a partial description of Welsh noun phrases within the framework of Lexical–Function Grammar (LFG), focusing on the behavior of pronominal clitics and pronominal possessors. Sadler's analysis involves chains of modifiers adjoined to both N and N′, which exhibit internal ordering restrictions that are not accounted for. The first part of this paper addresses the question of ordering adjuncts in the noun phrase, proposing a TAG–like analysis of syntactic adjunction via the unification of syntactic features. This account enforces linear precedence orderings on chains of adjuncts by essentially extending the feature– and unification–based principles governing f–structure to an aspect of c–structure.

The second part of this paper examines the Welsh possessor construction, which is intimately connected with determiners and the marking of definiteness. I argue that in order to cleanly capture the competitive interaction between possessors and determiner heads, these elements must reference the same grammatical function in f–structure. This function, SPEC, effectively replaces the functions DEF and POSS in encoding information regarding definiteness and the posessor, reflecting a deeper semantic generalization regarding elements

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that restrict the reference of the head noun. The SPEC analysis also accounts for the occurrence of demonstrative elements in a straightforward way, though it forces a reanalysis of definiteness as an emergent property of f–structures, instead of a property that is feature–coded directly.

1 Introduction

The noun phrase in Welsh exhibits a number of complex co–occurrence and ordering constraints that span the head noun.[1] Sadler (1997)a explores several of these constraints, directing her attention to the analysis of pronominal clitics within LFG.

LFG seems like the ideal formalism for capturing the Welsh facts elegantly, through locality mismatches between c–structure and f–structure. Elements located on opposite ends of the noun phrase can still share information directly via f–structure, affording a precise characterization of long–distance interactions with the elements remaining *in situ*. In contrast, the most extended analysis of the Welsh noun phrase to date, (Rouveret 1994:III), is framed in terms of GB/Minimalist syntactic assumptions. As a result, cross-nominal phenomena are explained in terms of c–structure localities that are obscured in surface structure by the movement of the noun head and other elements.[2]

This paper is concerned with modeling two sets of issues in Welsh noun phrases using LFG, building on the analysis of Sadler (1997)a. The structure of the paper is as follows: Section 2 reviews the relevant aspects of Sadler's analysis of noun phrases in LFG. Section 3 addresses the question of how multiple adjuncts may be ordered relative to each other, a question made relevant by Sadler's rather adjunct–rich approach to modeling pre–nominal elements. Section 4 is an investigation into co-occurrence restrictions involving possessors and determiner heads, which are left out of Sadler's account. Section 5 briefly summarizes the proposals made and concludes the work.

[1]Throughout this paper, the term "noun phrase" will be used as a descriptive cover term for the maximal constituent consisting of a noun and its modifiers, complements, and determiner. No specific syntactic analysis (e.g. NP vs. DP) is intended by this terminology. Rouveret (1994) uses the term *groupe nominal* for the same purpose.

[2]Rouveret's account resembles contemporary analyses of similar constructions in Irish, cf. (Duffield 1995, Duffield 1996).

I follow Sadler in using the version of LFG described in Bresnan (1995) as the basic framework of the analysis.[3] LFG models the constituency and functional relationships between linguistic objects in terms of linked parallel structures. Bresnan advances a theory of constituent structure (c–structure) in terms of a version of X' syntax. Both lexical and functional heads are assumed to project two bar levels of phrasal structure in the usual way. Default linkage between c–structure and f–structure is accomplished by the following principles of structure–function mapping:

(1) a. C–structure heads are f–structure heads.

b. Specifiers of functional categories are the syntacticized discourse functions or absent.

c. Complements of functional categories are f–structure co–heads.

d. Specifiers of lexical categories are a subclass of adjuncts or absent.

e. Complements of lexical categories are the non–discourse argument functions.

These principles will occasionally become relevant as the discussion proceeds.

2 Sadler's analysis of Welsh noun phrases

Sadler (1997)a focuses her discussion on the system of prefixed pronouns in Welsh, which are listed in the table in (2).[4] Previous treatments of Welsh syntax have assumed that these elements are pronominal clitics without proving the point. Sadler adduces several arguments in favor of this analysis, which I will adopt without further comment.

[3]Actually, Sadler cites a 1997 draft of the manuscript, but I do not happen to have access to this version at the moment. As far as I have been able to deduce, the 1995 and 1997 manuscripts largely agree on issues of general theoretical architecture. So, the version mismatch, while unfortunate, does not appear to be pernicious.

[4]Note that a condensed version of Sadler (1997)a is scheduled to appear as Sadler (1997)b.

(2)

PNG	clitic	mutation
1S	fy	nasal mutation
2S	dy	soft mutation
3SM	ei	soft mutation
3SF	ei	aspirate mutation
1PL	ein	
2PL	eich	
3PL	eu	

Among other uses, these pronouns are employed to indicate possession in noun phrases. A prenominal possessive can be doubled optionally by an agreeing postnominal pronoun, as in (3a). However, a postnominal possessor cannot usually appear without an agreeing pronominal clitic, as in (3b). Clitic pronouns cannot appear with nominal possessors, as seen in (3c,d)

(3) a. ei mam (hi)
CL.3SG.F mother (PRO.3SG.F)
'her mother'

b. *(ei) mam hi
(CL.3SG.F) mother PRO.3SG.F
'her mother'

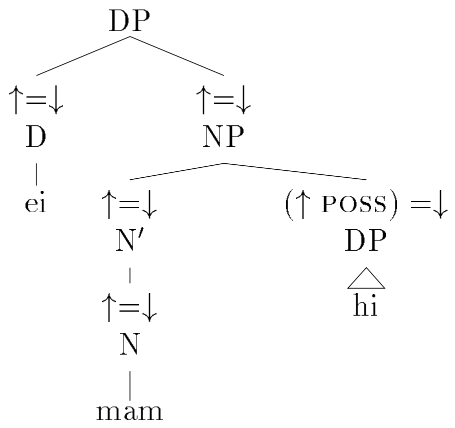
c. (*ei) mam y ferch
(*CL.3SG.F) mother the girl
'the girl's mother'

d. (*ei) mam Eleri
(*CL.3SG.F) mother Eleri
'Eleri's mother'

From the pronominal nature of these clitics, Sadler infers that they are likely members of the functional category D. This identification immediately suggests that the clitic may serve as the D head of its matrix noun phrase, presumably a DP. Such an analysis of the noun phrase in (3b) is seen in (4).[5]

[5]This is essentially the traditional analysis of pronominal clitics, maintained from (Jones and Thomas 1977) to (Rouveret 1994).

(4)



However, this analysis has problems. Sadler points out that pronominal clitics are also obligatorily used to express pronominal objects of non-finite transitive verbs (verb-nouns) and pronominal subjects of the non-finite copula *bod*. Relevant examples of these constructions are given in (5) and (6).[6]

(5) a. Mae Mair wedi gweld yr athro
be-PRES Mair PERF see the teacher
'Mair has seen the teacher'

b. Mae Mair wedi ei weld (e).
be-PRES Mair PERF CL.3SG.M see (PRO.3SG.M)
'Mair has seen him'

(6) a. Dyweddodd Gwyn fod Emrys yn ddiog
say-PAST.3 Gwyn be Emrys PT lazy
'Gwyn said Emrys is lazy'

b. Dyweddodd Gwyn ei fod fe yn ddiog
say-PAST.3 Gwyn CL.3SG.M be PRO.3SG.M PT lazy
'Gwyn said he is lazy'

These data are troublesome for the analysis in (4). If we analyze the clitic as a D head of a DP, then in sentence (5b.) the cliticized VP is actually a DP. Likewise, the cliticized IP in (6b.) is a DP, whereas the uncliticized version

[6]The examples in (6) are taken from Sadler (1997)a, her examples (9) and (10).

in (6a.) remains an IP. In both cases, there are major categorial crossings due to the extension of verbal projections by a determiner, which is otherwise unmotivated.

Considering the mapping from c– to f–structure, Sadler also notes that a clitic bears the grammatical function corresponding to a possessor, an object, or a subject depending on the construction in which it appears. Since a zero-level D node projecting to DP carries only the functional annotation $\uparrow=\downarrow$, the specification of grammatical function must be carried by the clitic itself. This necessity results in an ungainly disjunctive specification in the lexical entry for the clitic:

(7) **ei:**
$(\downarrow \text{PRED})=\text{`pro'}$
$(\uparrow \text{SUBJ}) =\downarrow \vee (\uparrow \text{OBJ}) =\downarrow \vee (\uparrow \text{POSS}) =\downarrow$
...

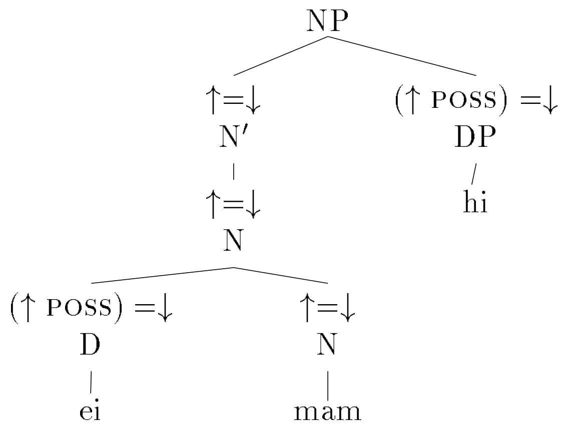
In light of these problems, Sadler rejects the more traditional noun phrase structure of (4) and instead proposes an analysis in which the pronominal clitic is adjoined directly to the head. She extends the principles of structure–function mapping in (1) with the principle in (8) in order to obtain the correct grammatical function assignment for the clitics.

(8) A language may make use of a lexical adjunction structure to express argument functions. The argument functions which can be so expressed are limited to those which the c-head normally projects as DP's in phrasal structure.

In noun phrases, the only possible argument function that the N head could project as a DP is the one corresponding to the possessor, which she takes to be POSS. It then follows from (8) that a clitic adjoined to N carries the annotation $(\uparrow \text{POSS}) =\downarrow$.[7] An annotated c–structure for (3a), *ei mam hi*, is shown in (9).

[7]Throughout her discussion, Sadler assumes that POSS is an argument function just like OBJ or SUBJ. However, the possessor function does not seem to be a typical argument function, since it is also associated with the specifier position of NP, as seen in (9). According to the structure–function mapping principles in (1), an association of an argument function with the specifier position of a lexical head is anomalous. However, Bresnan entirely omits consideration of the possessor from her typology of functions, so it is little wonder that the structure–function association principles are problematic as stated. Remedying this deficit is important, but further consideration of the matter will lead us too far afield from the matter at hand.

(9)



This structure, while unusual, has several strengths. The analysis of clitic accidence in terms of a small construction offers a straightforward explanation of the clitics' intermediate status between incorporated and independent pronouns. If the principle of morphological blocking is extended to such lexical constructions, then the clitic's pre-emption of the bare pronoun in the ungrammatical version of (3b) is nicely accounted for.

In addition, the availability of a process of adjoining directly to N^0 goes some way to explaining the restricted nature of prenominal modification in Welsh. Usually, N-modifying adjectives and adjective phrases appear postnominally, in accordance with the language's general tendency toward head-initial phrases. However, there is a small closed class of adjectives (e.g. *hen*, old and *gwahanol*, different) which can appear before the head noun, although full adjective phrases are barred in this position. Relevant examples of adjectival modification are listed in (10).

(10) a. teledu [drud iawn] Mair
television expensive very Mary
'Mary's quite expensive television'

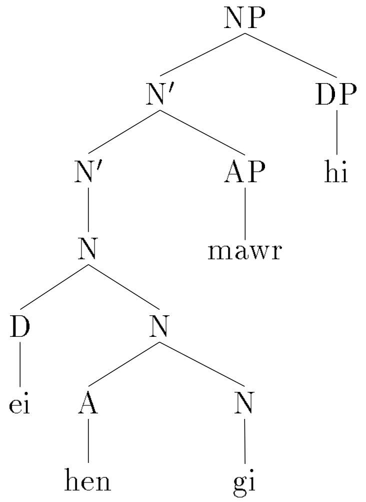
b. eu lwc [ddrwg iawn]
CL.3PL luck bad very
'their extremely bad luck'

c. ei hen gi mawr hi
CL.3SG.F old dog big PRO.3SG.F
'her big, old dog'

d. *ei [hen iawn] gi mawr hi
CL.3SG.F old very dog big PRO.3SG.F
'her big, very old dog'

Classifying pronominal clitics as direct adjuncts to N^0 forces the analysis of prenominal adjectives as similar adjuncts. Since these adjectives do not project phrasal structure, prenominal multiword AP's such as that in (10d.) are correctly excluded. Sadler analyzes postnominal adjectives (even bare adjectives) as full AP's adjoined to N'. So, the c–structure of (10c.) would be something like (11).

(11)



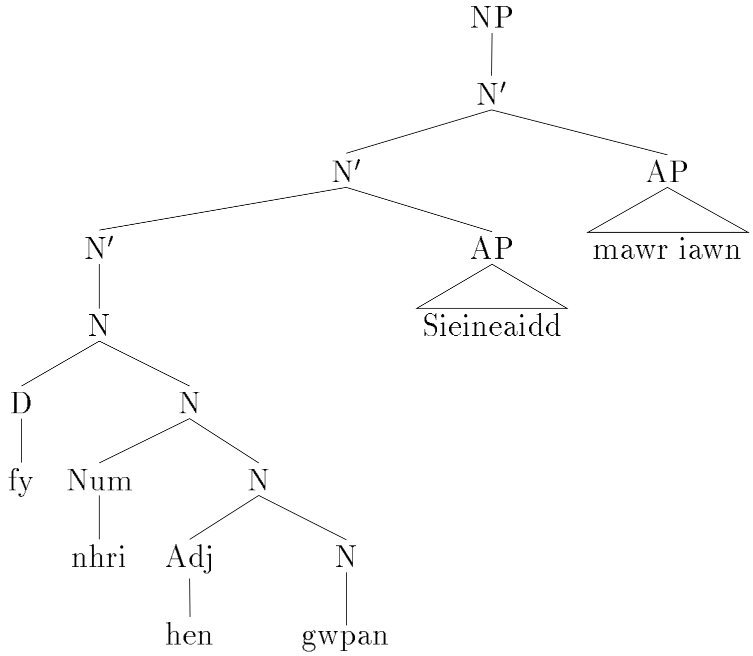
Notice that Sadler's analysis establishes two domains of iterative adjunction in the noun phrase: one at the level of N^0 and the other at the level of N'. As it stands, the analysis implies that the order of adjunction at either level is essentially free, since there is no principle operative to enforce ordering between adjuncts. This implicit prediction is falsified by the facts of noun modification in Welsh, which we will investigate in the next section.

3 Modifiers, adjuncts, and the enforcement of linear precedence

Multiple modifiers can occur both before and after the noun in Welsh, as seen in (12). As was noted in section 2, Sadler analyzes all such modifiers in terms of two classes of adjuncts: leftward adjuncts to N^0 and rightward adjuncts to N'. The c–structure for (12), after Sadler, is given in (13).

(12) fy nhri hen gwpan Sieineaidd mawr iawn
CL.1SG three old cup Chinese big very
'my three old very large Chinese cups'

(13)



This structure establishes an attractive symmetry between pre– and postnominal modification, but it glosses over the question of licit orderings of modifiers. Adjunction is a fairly unconstrained operation in LFG— there is no standard theory of adjuncts that governs what may attach to what. From a purely theoretical standpoint, we would expect to be able to permute the prenominal and postnominal sets of adjuncts and preserve grammaticality, but in fact the ordering in (12) is the only acceptable one. If we are to maintain the analysis of modifiers as adjuncts, then a new set of principles must be added to the LFG toolkit in order to enforce linear precedence orderings. It seems unlikely that a single principle can explain all of the Welsh facts, since there is strong evidence that modifiers in each domain obey distinct ordering constraints.

In this section, the relevant generalizations regarding the ordering of pre– and postnominal modifiers will be discussed in turn. Then, I will advance an augmented version of c–structure which captures these ordering phenomena through a more explicit account of adjunction in terms of syntactic features and unification. The inspiration for the proposed model of adjuncts is taken from work on tree–adjoining grammar (TAG), a general mathematical formalism for building hierarchical structures via the operation of adjunction.

3.1 Prenominal modifiers

In addition to pronominal clitics and the rare adjective, Welsh nouns can be preceded by simple (one–word) numerals and ordinals.[8] It is difficult to tell whether ordinals should be considered separately from other prenominal adjectives, since examples including both elements seem forced. However, I analyze numerals as a distinct class of modifiers, since they can co–occur with prenominal adjectives, as in (14b).

(14) a. ei thrydedd gi
CL.3SG.F third dog
'her third dog'

b. ei phump hen gi
CL.3SG.F five old dog
'her five old dogs'

The linear precedence ordering of clitic $<$ numeral $<$ adjective $<$ head attested in (14b) is invariant. Permuted orderings, such as the following, are ungrammatical:[9]

(15) a. *pump ei hen gi (Num $<$ CL $<$ Adj $<$ N)
five CL.3SG.F old dog
'her five old dogs'

b. *ei hen bump gi (CL $<$ Adj $<$ Num $<$ N)
CL.3SG.F old five dog
'her five old dogs'

[8] Complex numerals and ordinals are split into prenominal and postnominal portions in the literary language, and they are rendered by other constructions in colloquial Welsh.

[9] Note that the variation in word–forms between examples is somewhat hypothetical, but based on the established mutation effects of clitics and prenominal adjectives. The feminine singular possessive clitic triggers aspirate mutation in the following word; prenominal adjectives like *hen* trigger soft mutation (lenition).

d. *hen bump ei chi (Adj < Num < CL < N)
old five CL.3SG.F dog
'her five old dogs'

In addition, there can be at most one pronominal clitic, one numeral, and one prenominal adjective. Although it is easy to imagine how multiple clitics and numerals are ruled out on f–structure grounds, it is less clear why noun phrases such as (16) are unacceptable.[10]

(16) *gwahanol brif reswm
different chief reason
'a different main reason'

We can begin to explain the accidence of prenominal modifiers in terms of the following two generalizations:

(17) i. Pronominal clitics take widest possible scope.

ii. Prenominal adjectives must adjoin directly to the head noun.

The first generalization is motivated by the analysis of pronominal clitics as D elements. Determiners in canonical position have scope over the entire NP, and so it seems reasonable that a D in a small construction should take scope over the entire construction, by virtue of being the topmost adjunct. The second generalization captures a feeling that the prenominal adjective almost occupies a small construction within the small construction that Sadler proposes: only one of these adjectives may appear at a time, and if appearing the adjective must be adjacent to the head noun. These adjectives may be thought of as being exceptionally marked for attraction to the head noun. A precise proposal for the type of marking involved will be presented in section 3.3.

[10]The explanation for why there can at most one possessive clitic and at most one numeral modifying the head noun is fairly straightforward. The clitic specifies the value for the grammatical function corresponding to the possessor (POSS, in Sadler's view) in f–structure. By convention, each instance of a pronominal has a unique value of the PRED function, such that even two copies of the same pronoun cannot unify. So, if there were more than one pronominal clitic assigning a value to POSS, there would be a multiple specification for (POSS PRED), violating the condition of functional uniqueness on f–structures.

In a similar way, the numeral could establish a scalar value for the grammatical function NUM in f–structure, such that there would be a functional uniqueness violation if more than one numeral were present. This is admittedly an awkward means for ruling out multiple numerals, but it seems to be on the right track.

3.2 Postnominal modifiers

At least two ordering effects are seen with adjectival modifiers following the head noun, but only one of these is strictly amenable to syntactic analysis. First, as Rouveret (1994) notes, the adjective strings in the noun phrases in (18) cannot be permuted while retaining acceptability.

(18) a. cwpan mawr gwyrdd Sieineaidd
cup big green Chinese
'a large green Chinese cup'

b. buwch ddu gorniog
cow black horned
'a black horned cow'

(19) a. ??cwpan Sieineaidd gwyrdd mawr
cup Chinese green big
?? 'a Chinese green large cup'

b. ??cwpan gwyrdd mawr Sieineaidd
cup green big Chinese
?? 'a green large Chinese cup'

c. ??cwpan gwyrdd Sieineaidd mawr
cup green Chinese big
?? 'a green Chinese large cup'

As can be seen from the glosses in (19), a similar effect applies to the order of descriptive adjectives in English. Rouveret assumes that the order of descriptive adjectives is constant cross-linguistically, obeying a general semantic constraint.[11] For the purposes of the present discussion, I will follow Rouveret in attributing this ordering to semantic considerations, but

[11]Rouveret introduces this data in order to bolster his position that the head noun actually appears to the right of all adjective modifiers in deep structure, subsequently moving leftward from N^0 to D. The gist of his argument is thus based on the following comparison:

(20) a. A_1 A_2 A_3 N (English canonical order)

b. N A_1 A_2 A_3 (Welsh canonical order)

I will return to the question of how such preferences might be implemented in section 3.3.

The second ordering effect among postnominal modifiers is a tendency for bare adjectives to appear closer to the noun head than multi–word adjective phrases. This constraint overrides the preferred orders of descriptive adjectives seen in (18). For example, if any of the adjectives in (18a) are modified by the intensifier *iawn*, that adjective will preferentially occur at the end of the adjective chain:

(22) a. cwpan gwyrdd Sieineaidd [mawr iawn]
cup green Chinese big very
'a very large green Chinese cup'

b. ??cwpan [mawr iawn] gwyrdd Sieineaidd
cup big very green Chinese
'a very large green Chinese cup'

These data suggest that there is a syntactic linear precedence ordering among postnominal modifiers, such that heavier modifiers fall toward the right margin of N′. In cases where this syntactic constraint conflicts with the semantic constraints on descriptive adjective order, the syntax wins.

One other possible analysis of this phenomenon does not rely at all on establishing an ordering between adjuncts at the N′ level. Recall that Sadler simply assumes that bare adjectives following the noun are adjoined to N′, rather than N. There is reason for doubting this assumption. Returning to

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Assuming that universal semantic constraints govern the relative position of each A_i relative to the noun head, Rouveret concludes that the head must have been displaced in Welsh from an underlying position to the right of the adjectives. This move preserves the assumption that descriptive adjectives uniformly adjoin to the left of heads.

One might also interpret the uniformity of linear adjective order between the two languages in terms of some sort of constraints on the preferential processing of descriptors. On this analysis, the actual position of the head relative to the adjective chain is immaterial: the constraints operate directly on the linear sequencing of the adjectives. What would be ruled out by this hypothesis is a language in which descriptive adjectives occur in reverse order, as follows:

(21) cup Chinese green large ($N\ A_3\ A_2\ A_1$)

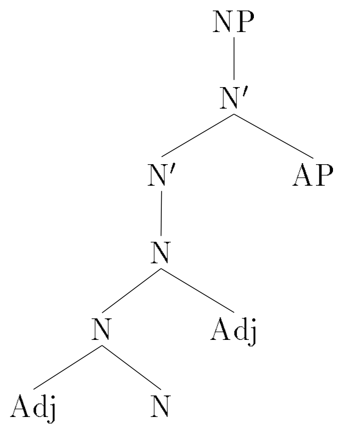
However, such an ordering would be permitted by constraints which govern the relative proximity of descriptors to the head, since the relative positions in this ordering are the same as in the English canonical order in (20a).

the complex example in (12), one can derive the following schema for nominal modification:

(23) (D^0) (Num^0) (A^0) N^0 (A^0) (AdjP)

If all bare head modifiers adjoin to N^0 , while phrasal modifiers adjoin to N', we can straightforwardly capture a general ordering preference for $X^0 <$ XP, which subsumes the preference for N < A < AP. Under this analysis, a noun phrase containing all three types of adjectival adjuncts (prenominal, postnominal bare adjective, postnominal AP) would be schematized as follows:

(24)



However, there is a trade–off, since this revised analysis extends the scope of the N^0–level small construction to include postnominal elements as well. From the perspective of Sadler's analysis, this might be seen as a major disadvantage: The small construction in noun phrases is already quite large compared to the analogous constructions proposed for verb phrases and IP's. If its scope is further increased, maintaining a special lexical status for the construction could seem increasingly implausible, while revoking such status would jeopardize Sadler's account of pronominal pre-emption via morphological blocking.

These are valid concerns, but I will side–step them in the interest of presenting a simpler analysis of how adjuncts may be ordered.[12] For the purposes of the present analysis, I will adopt the following revised division

[12] I think that it is possible to make an analysis work based Sadler's assumptions, but at the price of complicating the picture for adjuncts.

between phrasal modifiers adjoining to N′ and all other modifiers attaching to N^0:[13]

(26) a. **N^0 adjuncts:** D^0, Num^0, A^0

b. **N′ adjuncts:** AP

3.3 Enforcing precedence orderings on adjuncts

In LFG questions of constituent ordering are handled by the c–structure component of the theory. As it currently stands, c–structure affords a means to specify the linear ordering of specifiers, heads, and complements in endocentric constructions, and the order of the daughters of exocentric S. However, the linear ordering of adjuncts remains unconstrained, so we must move beyond the standard c–structure model in order to account for the phenomena described above.

I suggest that the solution to adjunct ordering lies in developing a more explicit notion of the process of adjunction. The inspiration for the account presented below comes from the characterization of TAG's with local constraints on adjoining in (Vijay-Shanker and Joshi 1985). However, I do not advocate anything as radical as replacing the c–structure component of LFG with a TAG. Rather, I propose a TAG–flavored analysis of syntactic adjunction, which nevertheless differs formally from the core TAG notion of adjunction.

I assume that each lexical item that can serve as an adjunct projects an adjunction structure which can carry certain syntactic features. For example, the adjunction structures of the prenominal adjective *hen* and and the postnominal adjective *mawr* are as follows (modulo any feature markings):

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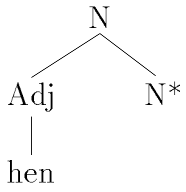
[13] Note that prepositional phrases in Welsh do not pattern with AP's in adjoining to N′. Prepositional phrases occur to the right of the possessor, as shown in this example taken from Awbery (1976:188):

(25) disgrifiad y gyrrwr o 'r ddamwain
description the driver of the accident
'the driver's description of the accident'

Since Sadler analyzes the possessor as occupying the specifier of NP, the PP *o'r ddamwain* must be adjoined to NP, not N′.

(27)



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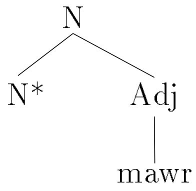


The starred node in an adjunction structure indicates the node which is identified with the adjunction site, and I will refer to such a node as a foot node of an adjunction structure. The mother node of an adjunction structure will be referred to as the apex node of the structure. Note that foot and apex nodes of the same adjunction structure share the same syntactic category, since we are implementing Chomsky adjunction.

The process of adjunction is nothing more than the identification of an adjunction structure's foot node with an adjunction site, accompanied by the unification of the bundles of syntactic features carried on both nodes. Adjunction is barred if the feature bundles do not unify. These feature bundles are presumed to contain the categorial features that labels such as 'N' and 'Adj' abbreviate, obviating the need for a separate requirement of categorial harmony between foot nodes and adjunction sites. For example, the adjunction structure in (27) cannot be adjoined to a V node, since the syntactic features of the foot node, an N, will not unify with those of carried by a V. In order to block adjunction to the incorrect bar level (e.g. adjoining (27) to N′ instead of N), nodes are assumed to carry a feature encoding the level of projection.

Precedence ordering among adjuncts is established via the lexical specification of syntactic features carried by the apex and foot nodes of adjunction structures. I propose that two features in particular are available for controlling adjunction: TOP and TERM. TOP is an feature that refers to the topmost terminus of an adjunction chain. TERM is a feature that intuitively references whether a node immediately dominates a lexical item, i.e. that it is the potential root of an adjunction chain. These features thus enable reference to both termini of a chain of adjuncts to X^0 in a straightforward way.

Given these features, the following value assignments capture the generalizations of prenominal modifier ordering stated in (17):

(29) **default:** All preterminal nodes are assigned [+TERM].

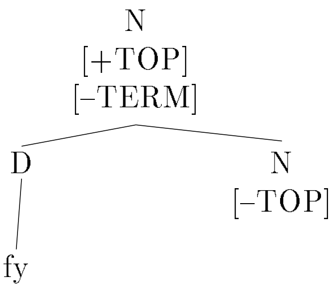
default: All apex nodes in adjunction structures are assigned [–TERM], all feet nodes are assigned [–TOP].

pronominal clitics: Apex node assigned [+TOP].

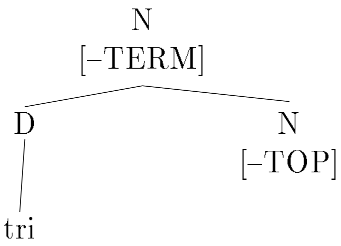
prenominal adjectives: Foot node assigned [+TERM].

Pronominal clitics demand widest scope, so the apices of their adjunction structures are marked as off–limits for further adjunction, via [+TOP]. The annotated adjunction structures for a clitic and a numeral are given below:[14]

(30)



(31)



Notice that the numeral *tri* 'three' is marked only with default values of TOP and TERM. The pronominal clitic *fy* 'my' has a special marking on its apex node, and the default feature values on its foot node.

Prenominal adjectives can only adjoin directly to head nouns, so the feet of their adjunction structures require adjunction to preterminal nodes, via a

[14] Feature specifications are only shown for apex and foot nodes.

marking of [+TERM].[15] This marking also ensures that only one prenominal adjective can appear, since adjunction to any node except a preterminal will result in a unification failure and there is only one preterminal node (at most) in a given chain of adjuncts. The annotated adjunction structure for a prenominal adjective is as follows:

(32)

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            N
         [–TERM]
   Adj               N
                  [+TERM]
                   [–TOP]
   hen
```

This adjunction structure has the default feature assignment on its apex node, and a special assignment of TERM on its foot node.[16]

In order to see how this analysis of adjunction works out in practice, let us consider the following examples:

(33) a. fy nhri hen gwpan
CL.1SG three old cup
'my three old cups'

b. *tri fy hen gwpan

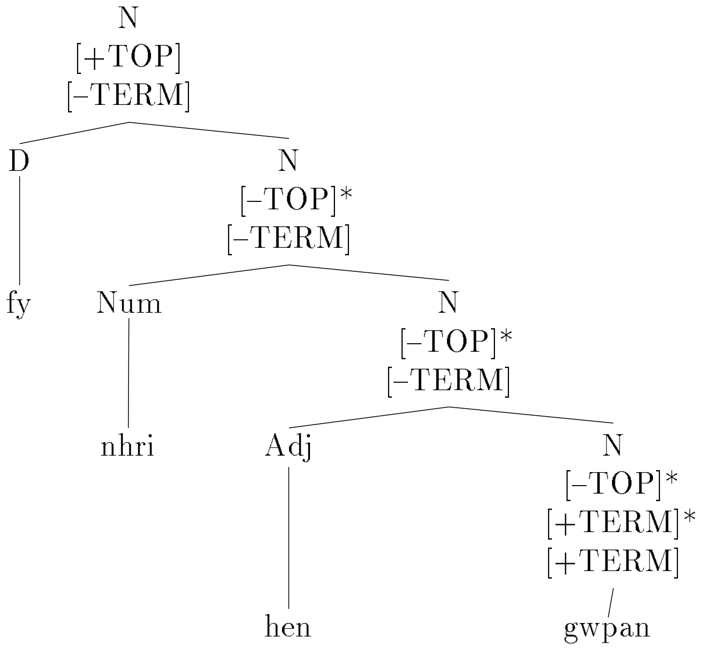
c. *hen fy nhri cwpan

The c–structures corresponding to the noun phrases in (33) are depicted below as they would be before the unification of apex and foot node features takes place. Features from foot nodes are labeled with a trailing asterisk.

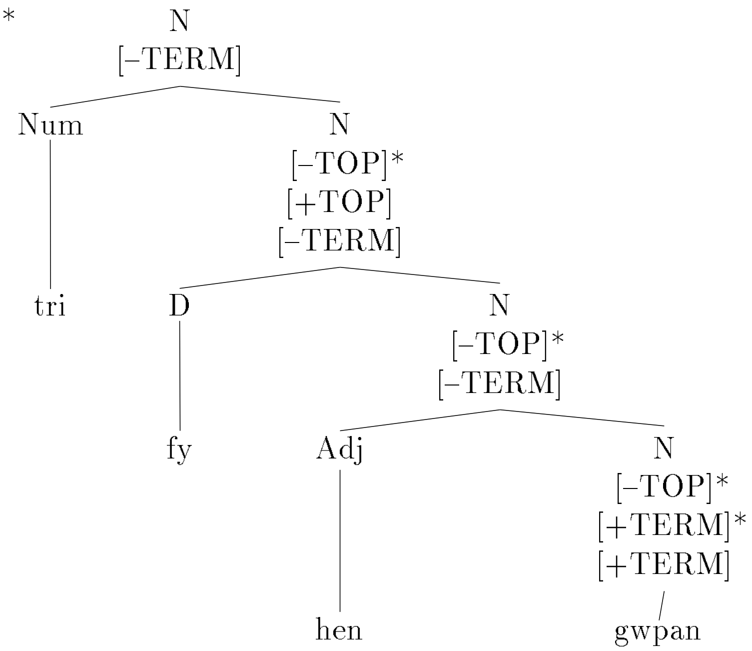
[15] This analysis of prenominal adjectives as non-heads that select for heads is reminiscent of the approach to sub-phrasal constructions in Korean advanced in Sells (1994).

[16] In some sense the marking of [–TOP] on the foot node is redundant, since under most circumstances [+TERM] entails [–TOP].

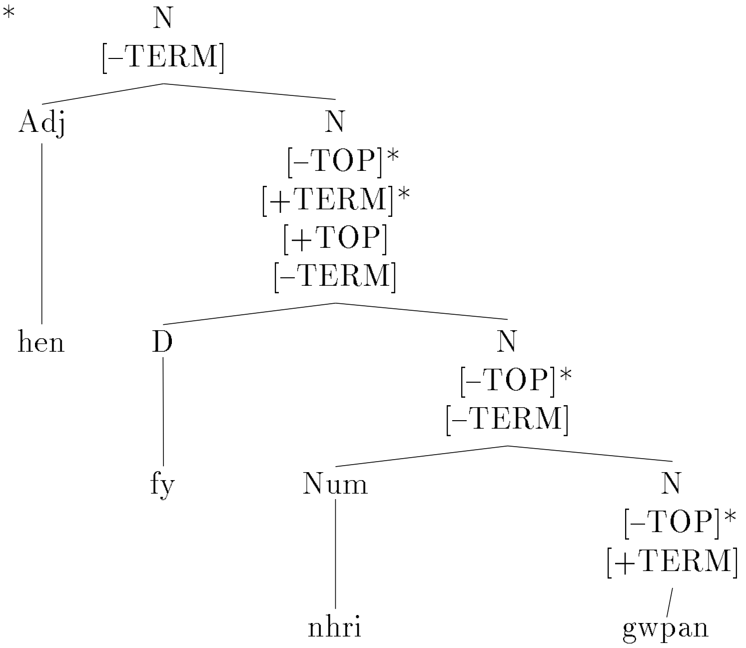
(34) a.


N
[+TOP]
[–TERM]
D
N
[–TOP]*
[–TERM]
fy
Num
N
[–TOP]*
[–TERM]
nhri
Adj
N
[–TOP]*
[+TERM]*
[+TERM]
hen
gwpan

b. *


N
[–TERM]
Num
N
[–TOP]*
[+TOP]
[–TERM]
tri
D
N
[–TOP]*
[–TERM]
fy
Adj
N
[–TOP]*
[+TERM]*
[+TERM]
hen
gwpan

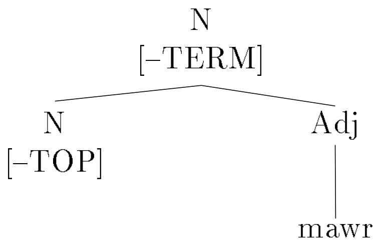
c. *



The structure in (34a) works because there are no obstacles to feature unification: The prenominal adjective has adjoined to a pre–terminal node, and nothing has adjoined to the determiner. In (34b), the [–TOP] feature carried by the foot node of the numeral clashes with the [+TOP] feature on the apex of the determiner. As a result, unification fails and the structure is barred. Otherwise, there are no problems. (34c) is barred by clashing features from the foot node of the adjective and the apex node of the determiner: they disagree on the values of both TERM and TOP.

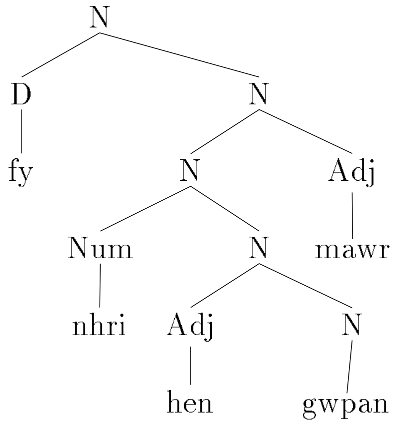
Turning now to the ordering phenomena discussed in section 3.2, postnominal bare adjectives are assigned adjunction structures just like numerals, except that they are left–headed:

(35)

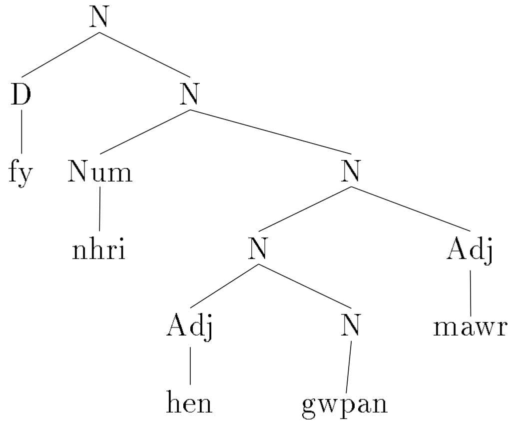


These adjectives are assumed to adjoin to N like the prenominal modifiers, obeying the same constraints on feature unification. Note that there is a great deal of flexibility in the placement of postnominal adjectives, since their position in the output string does not depend on the exact adjunction site. For example, both of the structures in (36) are valid derivations of the string *fy nhri hen gwpan mawr* 'my three old large cups':

(36) a.



b.



I assume that structural ambiguities introduced in this way are harmless, although they do detract from the elegance of the analysis.[17] It may be possible to further constrain the adjunction of postnominal descriptive adjectives if one assumes that the process of adjunction can be sensitive to semantic as well as syntactic features. Such features could further constrain the accidence of left–headed adjuncts, as well as enforcing the preferred order

[17]As pointed out by Thomas Wasow, the existence of such structural ambiguities could be confirmed by evidence of corresponding scope ambiguities between adjectives. Further investigation is required to settle this question.

of descriptive adjectives described in section 3.2. I have no definite proposals to discuss along these lines, so this question is left for future work.

This is, of course, something of a disappointment. Returning briefy to the examples in (22), we have only managed to explain why it is forbidden for AP's to precede bare adjectives in the postnominal domain. Since we assumed that AP's adjoin to N′ while A^0's adjoin to N, the reason for the unacceptability of (22b) is clear: the bare adjectives *gwyrdd* and *Sieineaidd* cannot adjoin to N′. This restriction is enforced via the syntactic category features in the foot nodes of the adjunction structures for the bare adjectives, which we assumed contained bar–level information.

In summary, an analysis of the adjunction operation in terms of adjunction structures and the unification of syntactic features affords a straightforward means for establishing linear precedence orderings between adjuncts in the Welsh noun phrase. Classical LFG offers no direct means for constraining relative adjunct placement, and this TAG–like account of adjunction is suggested as a way to handle adjuncts without introducing new principles wholesale. Unification and feature–matching are core aspects of the architecture of f–structure, and the proposed analysis is an extension of the scope of these theoretical devices to c–structure as well.

4 Determiners, definiteness, and the possessor

We now turn from the consideration of noun modifiers to larger issues in the syntax of the noun phrase. Welsh has a possessive construction in which a possessor noun phrase simply follows the head and its modifiers.[18] Possessors in Welsh show a number of interesting interactions with determiners such as the definite article *y*. The article cannot appear in a noun phrase containing a possessor, and possessors are able to establish definiteness for their matrix phrases by themselves. These phenomena suggest that possessors and determiners are in some sort of competition, even though they appear on opposite sides of the noun head.

[18]This construction is reminiscent of construct state nominals in Semitic languages, but this comparison will not be pursued in the present work. See (Duffield 1996) for a general discussion of construct state nominals and the possessive construction in modern Irish, which is similar to the Welsh possessive.

The first parts of this section present the starting analyses of the Welsh possessive construction and of determiners, especially the definite article. This exposition is followed by two analyses of the interaction between possessors and determiners: the first a conventional analysis in terms of the grammatical function POSS, and the second an improved analysis in terms of a new grammatical function SPEC that encodes information about both definiteness and nominal possessors. It is argued that SPEC captures a deep functional connection between determiners and possessors, accounting for the Welsh facts more elegantly than the factorization of definiteness and possessor information into two grammatical functions.

4.1 The possessive construction

Possessors in Welsh are expressed by a noun phrase following the head noun and its adjectival modifiers. There are no intervening prepositions, nor is there any distinctive genitive morphology.[19] Typical examples of this construction are seen in the sentences in (38).[20]

(38) a. Mae Mair wedi gweld car yr athro
be-PRES Mair PERF see car the teacher
'Mair has seen the teacher's car'

b. Mae John wedi dwyn het merch
be-PRES John PERF steal hat girl
'John has stolen a girl's hat'

[19] Possesssors can also be expressed periphrastically in Welsh by means of prepositional phrases, analogous to "of"–phrases in English:

(37) a. mab y brenin
son the king
'the king's son'

b. y mab i 'r brenin
the son to the king
'the son of the king'

Consideration of these constructions falls outside of the scope of the present work.

[20] The first three examples, also cited by Rouveret (1994), are taken from Jones and Thomas (1977:192-3), their examples (133), (134), and (135). I differ from Jones and Thomas in following Sproat (1985) analysis of as *yn* as a progressive particle in these sentences, rather than identifying it with the preposition *yn (in)*.

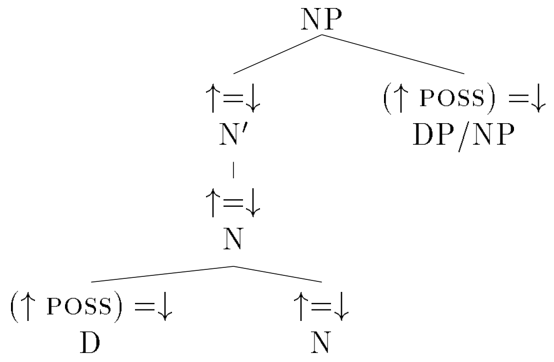
c. Mae pawb yn licio brawd Gwil
be-PRES everyone PROG like brother Gwil
'Everyone likes Gwil's brother.'

d. Mae Huw yn hoffi ei mam hi
be-PRES Huw PROG like CL.3SG.F mother PRO.3SG.F
'Huw likes her mother.'

This construction is employed for encoding several different kinds of relations between entities, beyond simple possession. For example, the phrase *llyfr Dewi* 'Dewi's book' can be used to refer either to a book that Dewi owns or one he has written. As with English possessives, the precise meaning evoked depends on the context of utterance.

A preliminary analysis of the possessive construction is provided by (Sadler 1997a). Sadler proposes the following annotated c–structure for Welsh noun phrases:[21]

(39)



In this picture, the postnominal possessor is analyzed as the specifier of NP, branching to the right. Since Welsh possessors carry no additional morphology, the grammatical function corresponding to the possessor is assigned configurationally, by annotation on the specifier position itself. The grammatical function POSS is used to capture the information contributed by possessors to the overall f–structure of the noun phrase. Note that since a pronominal clitic also contributes information about the possesor, there are two positions that are are labeled with POSS. Sadler shows how this distribution of the same information structure over the c–structure explains the mutual exclusion of

[21]For the purposes of the present discussion, the numerals and adjectival modifiers discussed in section 3 are ignored.

of pronominal clitics and and non-pronominal possessors and contributes to the pre–emption of possessors in Spec by pronominal clitics.[22]

This analysis of the possessive will serve as a jumping–off point for deeper investigations into the relationship between possessors and determiners. However, before such interactions can be examined, we must first establish a basic analysis for determiners in Welsh noun phrases.

4.2 Determiners and the article

Welsh has no indefinite article, but it does have a definite article *y*.

(40) a. beic
bicycle
'a bicycle'

b. y beic
the bicycle
'the bicycle'

I adopt the conventional analysis that the article is a D. The operative question is what position it occupies in c–structure. Either the article serves as the functional head of the whole noun phrase, which would then be analyzed as a DP, or the article occupies the same D slot that is available to pronominal clitics in Sadler's small construction. Brief reflection on the grammatical function of the article reveals that it must be the head of DP, since it is incompatible with the functional annotations on the position adjoined to N^0.

Let us provisionally analyze the article as contributing a value for the grammatical function DEF, a binary definiteness feature. Under this analysis, the lexical entry for *y* would be as follows:

(41) **y:**
$(\uparrow \text{DEF}) = +$

In Sadler's analysis, D's in small constructions are marked as contributing the value for the function POSS in f–structure. So, if the article is a D adjunct to N, then the noun phrase in (40b) has the f–structure in (42) below:

[22] Clitic/possessor mutual exclusion is discussed more explicitly in section 4.4. Pre–emption of pronominal possessors was touched on in section 2, but properly falls beyond the scope of the present discussion— see (Sadler 1997b) for details of the analysis.

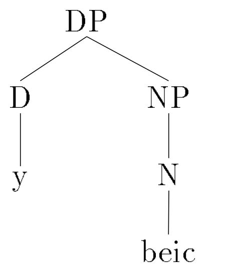
(42) $\begin{bmatrix} \text{POSS} & \begin{bmatrix}\text{DEF} & + \end{bmatrix} \\ \text{PRED} & \text{‘BICYCLE’} \\ \text{NUM} & \text{SG} \\ \text{PERS} & 3 \\ \text{GEND} & \text{MASC} \end{bmatrix}$

However, it is clear that this is not the f–structure that we want for *y beic*. In the first place, this noun phrase gives no evidence of containing a possessor, so it seems strange to be defining the POSS function in f–structure at all. Beyond this, it is unacceptable to place the definiteness specification in a subsidiary f–structure, since it is the bicycle itself that is definite. The correct f–structure for this example is the one in (43), where DEF is defined at the topmost level:

(43) $\begin{bmatrix} \text{DEF} & + \\ \text{PRED} & \text{‘BICYCLE’} \\ \text{NUM} & \text{SG} \\ \text{PERS} & 3 \\ \text{GEND} & \text{MASC} \end{bmatrix}$

But this is exactly the f–structure that we get if we analyze the article as the head of DP, taking NP as its complement. According to Bresnan's (1995) principles of structure–function association, functional heads are f–structure co–heads with their complements. So, the article is effectively an f-structure co–head with the noun, resulting in the desired pooling of infomation at the topmost level of f–structure. Adopting this analysis, the noun phrase in *y beic* is assigned the following c–structure:[23]

(44)



[23]Intermediate bar levels that do not branch are not shown.

Note that up until this point, all of the noun phrases under consideration have turned out to be NP's, even those containing pronominal clitics. If a categorically uniform analysis of all noun phrases were desirable, then we would be forced to make the somewhat dubious claim that even (40a) is a DP with an empty head. Empty heads are not in and of themselves problematic in LFG, but there is little empirical motivation to suppose that (40a) is more than an NP. I will therefore maintain a mixed analysis of Welsh noun phrases, in terms of both NP's and DP's.

Although we will be concentrating most of our attention on the behavior of the article, it should be noted that *y* is not the only element that serves as head of DP. There are a number of quantifiers which are also typically analyzed as head determiners, such as *pob* 'every' and *rhyw* 'some':

(45) a. pob car newydd
every car new
'every new car'

b. rhyw gar newydd
some car new
'some new car'

c. unrhyw car newydd
any car new
'any new car'

d. dim car newydd
no car new
'no new car'

The traditional grouping of these elements with *y* rests on two facts: First, quantifiers like *pob 'every'* occur in mutual exclusion with possessors, just as the article does.[24] Second, in the absence of a possessor, either a single quantifier or the article can appear, but not both.[25]

(47) a. *y pob gar newydd

[24]This aspect of determiner/possessor interaction is the focus of section 4.3.

[25]Thorne (1993:§247) reports that the quantifiers *rhyw* 'some' and *cyfryw* 'such' often follow *pob* 'all' in expressions such as those in (46), suggesting that multiple quantification may be possible.

b. *pob y car newydd

c *rhyw ei gar newydd

d. *ei bob car newydd

Adopting the analysis of these quantifiers as competing candidates for the head of DP explains why only one quantifier can be present at a time, and mutual exclusion with the article is also guaranteed.

Now that we have established the existence of a head of DP position which is occupied by the article (among other elements), we will move on to consider the interaction of this position with the possessive construction.

4.3 Determiners and possessors: a first attempt

Determiners and possessors seem to be in competition with each other in the Welsh noun phrase, even though these elements occupy different syntactic positions. A given noun phrase may contain a determiner head or a possessor, but not both, and a possessor can establish definiteness for its matrix noun phrase in the absence of the article. The purpose of this section is to work out an (ultimately unsatisfactory) analysis of these two phenomena based on our current f–structure analyses of the possessive construction and the article. The problems encountered in doing so will motivate the revised analysis in section 4.4. The final part of this section introduces some particularly

---

(46) a. pob rhyw beth
every some thing
'every kind of thing'

b. pob cyfryw beth
every such thing
'every such thing'

Even if these expressions are not literary artifacts, they still need not jeopardize the conclusion that quantifiers occupy the head of DP. It may be that the apparent doubling of the determiner is due to a small construction, adjoining bare D to D, or the second determiner may be attached to the head noun. The noun *peth* 'thing' seems to have an affinity for quantifiers, for the compound *rhywbeth* 'something' has entered the language as a separate lexical item. Although there does not appear to be a corresponding standard compound *cyfrywbeth*, meaning 'such a thing', I suggest that a process of compounding may be at work here, rather than a multiplication of discrete determiners. Whatever the exact analysis, there appears to be no other evidence of multiple quantifiers in Welsh.

problematic data involving the accidence of demonstrative elements in the noun phrase.

4.3.1 Mutual exclusion of possessors and determiners

In Welsh, neither the definite article nor quantifiers can head a noun phrase that contains any type of possessor:

(48) a. (*y) beic bachgen
(*the) bicycle boy
'(*the) a boy's bicycle'

b. (*y) beic y bachgen
(*the) bicycle the boy
'(*the) the boy's bicycle'

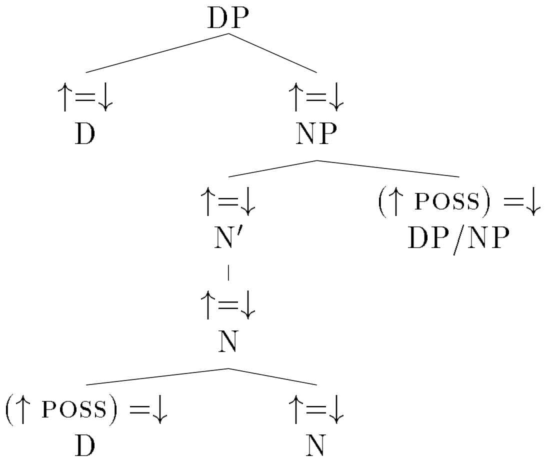
c. (*y) beic Siôn
the bicycle John
'(*the) John's bicycle'

d. (*yr) ei beic e
the CL.3SG.M bicycle PRO.3SG.M
'(*the) his bicycle'

e. *pob feic y bachgen
all bicycle the boy
'all the boy's bicycles'

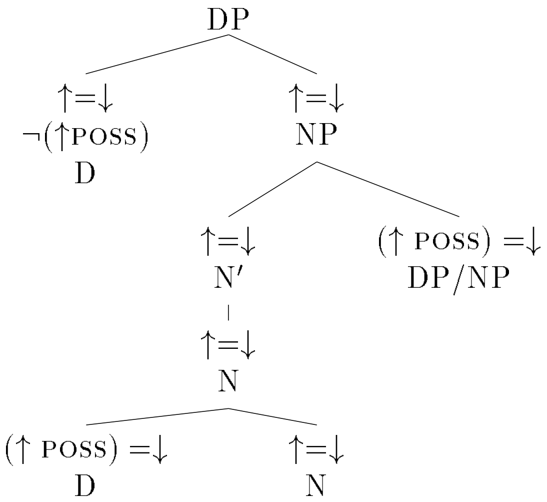
In section 4.2, we established the syntactic position of the article or quantifier as the head of DP. As a first step in modeling mutual exclusion, let us extend Sadler's noun phrase schema in (39) with a DP projection, resulting in the following picture:

(49)



Since the possessor and the head of DP do not configurationally block each other, their mutual exclusion must be captured by reference to f–structure. Given the resources of LFG, we can model the exclusion by annotating the head node of DP with a negative existential constraint barring the specification of POSS.[26] Such constraining specifications are available as part of the basic theoretical apparatus in (Bresnan 1995). Adding these modifications to the structure in (49), we arrive at the following:

(50)



[26]An alternative would be to postulate features carried by the article and quantifiers, rather than exceptionally annotate a syntactic position. Given the lexical entry for the article assumed in (41), such an approach is no more explanatory than the current approach, requiring the introduction of special features to build a lexical class of entities that can appear as head of DP.

The effect of the negative constraint is to block any f–structure that contains a POSS function along with information from a D-head of DP. That is, the f–structure is blocked just in case the noun phrase contains a posessor and the head of DP is filled. This annotated c–structure technically captures the phenomenon of possessor/determiner mututal exclusion, but in a less than enlightening fashion. There seems to be a strong opposition between possessors on the one hand, and full determiners on the other, which is not captured by the proposed bookkeeping constraint.

4.3.2 Possessors and definiteness

In addition to blocking the occurrence of the article, a possessor also seems to assume its function, establishing a definiteness value for its matrix noun phrase. If a noun phrase contains a possessor which is itself definite, then the entire noun phrase is considered definite:

(51) a. Gwelais i fab brenin.
see.PRET.1SG PRO.1SG son king
'I saw a son of a king.'

b. Gwelais i fab y brenin.
see.PRET.1SG PRO.1SG son the king
'I saw the son of the king.'

c. Gwelais i fab ei frawd.
see.PRET.1SG PRO.1SG son CL.3SG.M brother
'I saw the son of his brother.'

Pronominal clitics and proper nouns are assumed to be definite for these purposes, as in (51c) above. Note that in order to combine a definite possessor with an indefinite possessum, one must employ a periphrastic construction:

(52) Gwelais i fab i 'r brenin.
see.PRET.1SG PRO.1SG son to the king
'I saw a son of the king.'

The semantic fact of definiteness can be verified syntactically. Predicative copula sentences headed by a form of the verb *bod* 'to be' show an interesting selectivity in what noun phrases are allowed to be predicates. For example, if a noun phrase is headed by the definite article, it cannot appear in the construction:[27]

(53) a. Mae Mair yn athrawes.
be.PRES Mair PT teacher
'Mair is a teacher.'

b. *Mae Mair yn yr athrawes.
be.PRES Mair PT the teacher
'Mair is the teacher.'

If this were the extent of the restriction, then one might suppose that the construction is selecting for NP's instead of DP's. However, NP's containing definite possessors are also barred from appearing, while NP's with indefinite possessors are allowed:[28]

(54) a. Y mae Arthur yn fab brenin.
PT be.PRES Arthur PT son king
'Arthur is a son of a king.'

b. Mae hwn yn lyfr bachgen.
be.PRES DEM.PROX.SG.M PT book boy
'This is a book of a boy.'

(55) a. *Y Mae Arthur yn fab y brenin.
PT be.PRES Arthur PT son the king
'Arthur is the son of the king.'

[27]These examples are taken from Jones and Thomas (1977), chapter III, their examples (138) and (145).

[28]Examples taken from Rouveret (1994:11), his (23) and (24). Note that Rouveret glosses (54b) as 'C'est le livre d'un garcon', while maintaining that *llyfr bachgen* is syntactically indefinite. I have chosen to clearly gloss the noun phrase as indefinite, viz. 'a book of a boy', which is an acceptable reading. However, it would also be possible to gloss the noun phrase as 'the book of a boy' if one wished to emphasize the reading in which the book is a representative element of the class of boy's books. The ambiguity of interpretation introduced by an indefinite possessor is probably better evoked by employing the English possessive, e.g. 'a boy's book', but it is more difficult to read the syntactic indefiniteness of the entire noun phrase off of such a gloss.

b. *Mae hwn yn lyfr y bachgen.
be.PRES DEM.PROX.SG.M PT book the boy
'This is the book of the boy.'

The only thing that distinguishes noun phrases with articles and definite possessors and noun phrases with indefinite possessors is the overall definiteness of the noun phrase. Thus, the proper charactertization of the *bod· · ·yn* construction is that definite noun phrases are barred from appearing as predicates, syntactically confirming our glosses.[29]

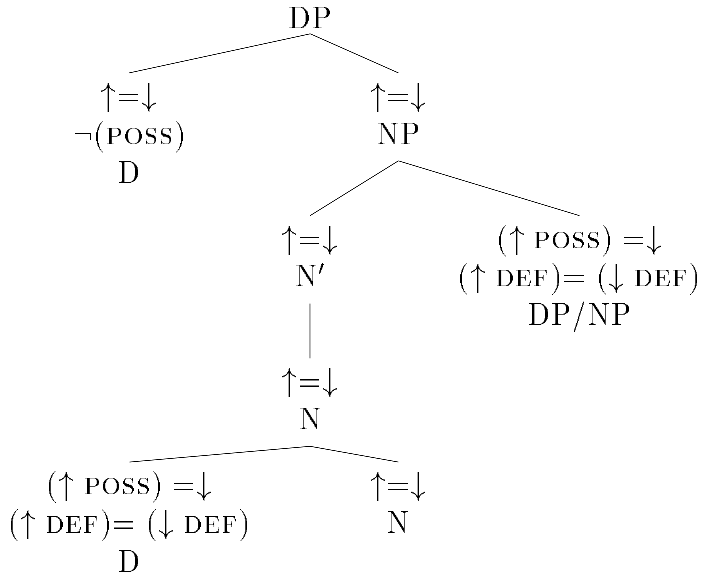
The observed concord between the definiteness of the noun phrase and the definiteness of possessors can only be captured via further c–structure annotations. The desired effect is achieved if the annotation (↑ DEF)=(↓ DEF) is associated with positions assigning POSS:

[29]This characterization of copula sentences is accepted by many authors, but not all. In discussing this construction, Jones and Thomas (1977:45–6) argue that a distinction must be made between definite head nouns (i.e. nouns preceded by an article) and definite possessor noun phrases. They claim that the fundamental requirement of the predicative construction is that the predicate phrase must be *generic*, which precludes any markers of definiteness (like the article) on the head noun. However, they assert that the predicate phrase may be still be *specific*, containing a definite possessor, as in (56) below.

(56) Mae Mair yn nwrs y pentre'.
be.PRES Mair PT nurse the village
'Mair is the village nurse.'

Unfortunately, Jones and Thomas do not further develop this nice distinction between specificity and definiteness, nor do they comment on the productivity of sentence patterns such as that in (56). My limited investigations in this area suggest that the phrase *nwrs y pentre'* is a frozen expression, at best. My informant did not even accept (56) as well-formed, though the same sentence without the definite article on *pentre'* was judged acceptable.

(57)



The article *y* is assumed to be lexically marked DEF + (cf. the lexical entry in (41)), as are all pronouns, pronominal clitics, and proper nouns. Other nominals are unspecified for definiteness. As a result, if a noun phrase contains a possessor that is a proper noun, a pronominal (including pronominal clitics), or a definite noun phrase, the matrix noun phrase itself will be marked as definite, as desired.

As before, the proposed annotations technically capture the facts, but not the reasons behind them. The deficiencies become even more obvious upon consideration of the accidence of demonstrative elements in the noun phrase.

4.3.3 Demonstratives and definiteness

Welsh employs two sets of demonstratives, one pronominal in origin e.g. *hwn*, *hon*, *hynny*) and one adverbial (*yma*, *yna*, and *acw*). The adverbial system is used predominantly in Colloquial Welsh, while *hwn*, etc. remain the standard in the literary language. A demonstrative element can occur in a noun phrase just in case the phrase is headed by the definite article. Demonstratives are never found in the absence of the article, even if the noun phrase is headed by another determiner or if it contains a definite possessor:[30]

[30] The first three examples in (58) are taken from (Rouveret 1994), his (75a) and (77a–b).

(58) a. y llyfrau rhagorol hyn
the books excellent these
'these excellent books'

b. *mab hwn y brenin
son this the king
'this son of the king'

c. *y mab hwn y brenin
the son this the king
'this the son of the king(?)'

d. *pob gar yma
all car this
'all these cars'

So, the demonstrative neither appears generally in all definite noun phrases nor in all DP's. It is licensed only in definite DP's, i.e. in noun phrases headed by the article. Within our current framework of assumptions, we cannot capture this fact except by postulation of additional features, further cluttering the analysis.

4.4 Determiners and possessors: a unified analysis

A more satisfactory account of possessor/determiner interactions can be devised if we are willing to revise our implicit assumption that the informational contributions of determiners and possessors are essentially distinct. Taylor (1996) notes that there is a great deal of similarity between possessives and determiners in terms of their semantic function. He observes (p. 184) that "... the possessor phrase [NP POSS] can be regarded as a kind of determiner to the possessee noun" in English. Both possessors and determiners serve to specify the reference of a noun phrase by picking out certain instances of the kind or class of entities denoted by the head noun and its modifiers. A definite article, such as the Welsh *y*, establishes reference by indicating that the class instance(s) in question are uniquely salient in the discourse context. A possessive construction establishes reference by relating the class instance(s) intended to another entity or set of entities. The relationship intended depends on context— it could be ownership, authorship, parenthood, or any number of other relations. The key observation is that both determiners and possessors are performing the same semantic function, and this kinship should be reflected in the f–structural abstraction of their informational contributions.

I propose that the root of our difficulties in capturing the relationships between determiners, possessors, and demonstratives in the Welsh noun phrase lies in the implicit factorization of reference specification into the two functions DEF and POSS. DEF is canonically associated with articles, although the possessor can directly impinge on its value, as seen in Welsh. POSS is presumably the sole responsibility of possessors, and at first glance it seems puzzling why a D head should be sensitive to its value. If both of these functions are seen properly as aspects of the same grammatical function, responsible for establishing specific reference, then such puzzles begin to resolve.

The substance of my proposal is the abolition of DEF and POSS in favor of a new grammatical function, SPEC. This function encodes information for establishing the reference of a noun phrase, and it has two canonical associations: a lexical association with determiners and a configurational association with the specifier of the lexical head N. SPEC's key characteristic is that its value ranges over both constants and f–structures, allowing it to emulate both DEF and POSS individually and capture their interactions. For example, the lexical entry of a definite article like the Welsh *y* would be revised as follows:[31]

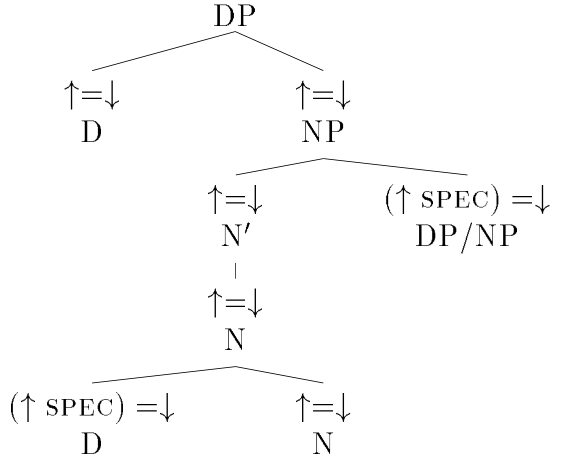
(59) **y:**
$(\uparrow \text{SPEC}) = \text{SALIENT}$

Instead of specifying that the matrix f–structure has the feature-value pair DEF $+$, the article specifies that the SPEC function of the current f–structure has the constant value SALIENT, indicating that the referent is salient in context.

Moving on to the configuration of the noun phrase, we can strip the c–structure schema in (57) of annotations in terms of DEF and POSS and replace them with simpler annotations in terms of SPEC:

[31] The remainder of the analysis focuses on the article to the exclusion of other determiners. An explicit analysis of quantificational determiners such as *pob* 'all', while desirable, involves issues that go far beyond the scope of this paper. As a result, a detailed account of these elements is left for future work.

(60)

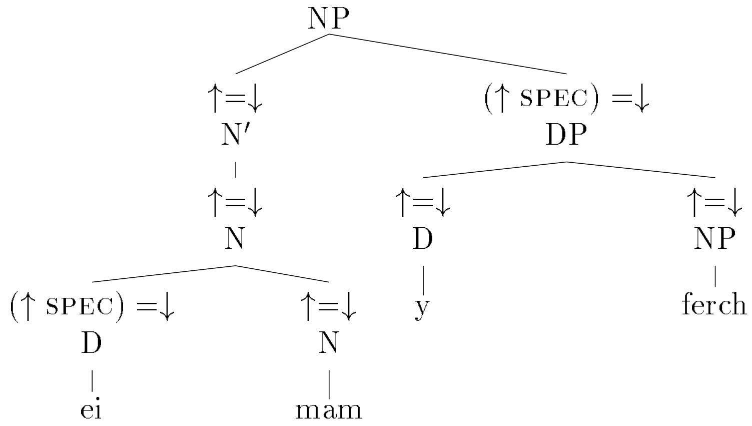


SPEC works just as well as POSS to block the co-occurrence of pronominal clitics and possessors: if the f–structures contributed by the two possessor positions do not unify, then the derivation will violate the functional uniqueness condition on f–structures and crash. Consider the noun phrase in (3c), reproduced below in (61):

(61) *ei mam y ferch
CL.3SG.F mother the girl
'the girl's mother'

Both the possessive clitic *ei* and the possessor *y ferch* contribute values for the grammatical function SPEC:

(62)



Partial lexical entries are listed for *ei* and *merch* in (63) and (64):[32]

ei:

(63) $(\uparrow \text{PRED})=\text{`pro'}$
$(\uparrow \text{NUM}) = \text{SG}\ (\uparrow \text{GEND}) = \text{FEM} \cdots$

merch:

(64) $(\uparrow \text{PRED})=\text{`girl'}$
$\ldots$

Notice that the possessive clitic and the possessor noun specify different values for the PRED function of SPEC: 'pro' and 'girl'. Since these values cannot unify, functional uniqueness is violated in the f–structure corresponding to (62), described below as function f_1:

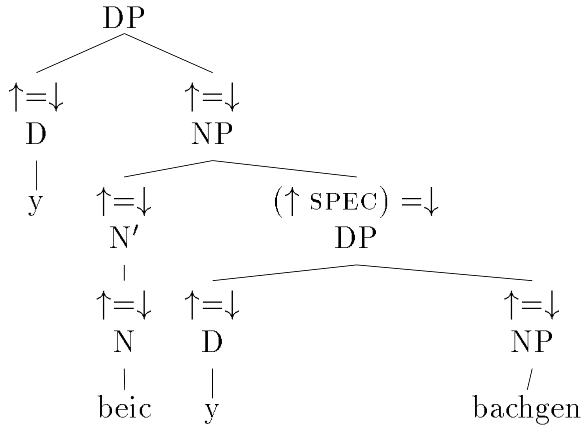
$$
\begin{array}{ll}
 & (f_1\ \text{PRED}) = \text{`mother'} \\
 & (f_1\ \text{SPEC}) = f_2 \\
 & (f_2\ \text{NUM}) = \text{SG} \\
 & (f_2\ \text{GEND}) = \text{FEM} \\
(65) & (f_2\ \text{PERS}) = 3 \\
 & (f_2\ \text{PRED}) = \text{`pro'} \qquad \Longleftarrow \\
 & (f_2\ \text{PRED}) = \text{`girl'} \qquad \Longleftarrow \\
 & (f_2\ \text{SPEC}) = \text{SALIENT}
\end{array}
$$

f_1 is ill–formed because it contains an ill–formed f–structure f_2 that assigns two values to the attribute PRED. Hence, derivation of the noun phrase in (61) is blocked.

The condition on functional uniqueness also guarantees that an explicit determiner and a possessor will not co-occur. If the article is present, then it contributes the constant SALIENT as the value of SPEC. However, a possessor contributes a full f–structure as the value of SPEC, which cannot be made to unify with a constant. For example, consider the following c–structure for the ungrammatical version of (48b):

[32]The noun em merch, like other Welsh feminine nouns, undergoes soft mutation following the article. Hence, we have *y ferch* in (61) rather than **y merch*.

(66)



As indicated in (59), the lexical entry for the determiner head of the matrix DP contributes the constant value SALIENT for the attribute SPEC. But the embedded DP also contributes its entire corresponding f–structure as the value of SPEC, yielding the following f–structure f_3 for the entire DP:

$$(67)\quad \begin{array}{ll} (f_3 \text{ PRED}) = \text{`bicycle'} & \\ (f_3 \text{ SPEC}) = \text{SALIENT} & \Longleftarrow \\ (f_3 \text{ SPEC}) = \text{f}_4 & \Longleftarrow \\ (f_4 \text{ PERS}) = 3 & \\ (f_4 \text{ PRED}) = \text{`boy'} & \\ (f_4 \text{ SPEC}) = \text{SALIENT} & \end{array}$$

f_3 is ill–formed because the values for the attribute SPEC contributed by the head determiner and the possessor DP cannot unify, resulting in a violation of uniqueness. The same problem would occur if the possessor were indefinite, as in **y beic bachgen*, since the conflict occurs at the assignment of values to SPEC in the matrix f–structure. Changing the value of SPEC in the embedded f–structure corresponding to the possessor noun phrase cannot resolve the problem, and so the f–structure of any noun phrase containing a determiner head and a possessor is ill–formed.

The proposed grammatical function SPEC also affords a simple characterization of the behavior of the Welsh demonstratives. A sample lexical entry for a demonstrative pronoun would be as follows:

hwn:

(68) $(\uparrow \text{SPEC}) =_c \text{SALIENT}$
$(\uparrow \text{NUM}) = \text{SG}$
$(\uparrow \text{GEND}) = \text{MASC}$
$(\uparrow \text{DEIXIS}) = \text{PROXIMAL}$

Via a constraint equation, each demonstrative element requires that the SPEC of its matrix f–structure have the constant value SALIENT, which is only the case if the definite article heads the noun phrase. The intuition is that demonstrative elements are not licensed in Welsh unless the referent is salient in the current discourse context, which seems to be a reasonable restriction on deixis.[33]

The move to SPEC does introduce some complexity in the analysis of overall noun phrase definiteness. Recall the data in (53), (54), and (55) above, which indicated that the *yn* construction in Welsh copula sentences is sensitive to the definiteness of its argument. On the basis of this and other evidence, we concluded that the possessor of the noun phrase in Welsh controls the definiteness of its matrix noun phrase, and this control was modeled via functional annotations to possessor positions that passed the value of DEF up to the highest f–structure for the noun phrase. Now that DEF has been replaced by SPEC, such annotations are no longer available. As a result, all definite noun phrases can no longer be characterized in terms of a shared feature, namely the feature DEF + in the matrix f–structure of the noun phrase.

However, the information that was encoded in the DEF attribute has not been lost. A noun phrase in Welsh is definite if it a) is headed by the article *y* or b) contains a possessor that is itself definite. Under the SPEC analysis, this generalization translates to the following:

(69) The f–structure f_1 is interpreted as *definite* if either (i) or (ii) is true:

i. $(f_1\ \text{SPEC}) = \text{SALIENT}$

ii. $(f_1\ \text{SPEC}) = f_2$, where f_2 is interpreted as definite

[33] The question of where the demonstrative resides in the noun phrase is open to question. Given the endocentric structure in (60), a likely possibility is that the demonstrative appears as the topmost adjunct to N′. Such an ordering is guaranteed if we assume the adjunction structure of the demonstrative carries a [+TOP] specification on its apex node, cf. the discussion of pronominal clitics as the topmost adjuncts to N in section 3.3.

Definiteness is now seen as a property that emerges from the interpretation of f–structures. The principles in (69) establish sufficient conditions for this interpretation. I suggest that definiteness in Welsh at least is better modeled as an interpreted property than as a binary feature that is coded into the system. For example, there is evidence that noun phrases which contain indefinite possessors can still have definite reference. As Morris-Jones (1931) notes in §12(ii),

> When the noun in the genitive is indefinite, the first noun is definite or indefinite according to the sense, as *llywodraeth gwlad* 'the government of a country', *dalen llyfr* 'a leaf of a book'.

This observation suggests that definiteness can be ascribed on the basis of semantic interpretation in context, a process entirely consistent with the formulation in (69). If definiteness were taken to be explicitly marked by a feature, one would be forced to draw a distinction between the "syntactic" definiteness of *y beic* 'the bike' and the "semantic" definiteness of *drws ty* 'the door of a house', which is assigned by entirely different means. Such analytic fragmentation is better avoided.[34]

---

[34]As pointed out by Peter Sells, the move to definiteness–by–interpretation does undercut the argument advanced in section 4.2 for the existence of DP's in Welsh. The principle of interpretation in (69) guarantees that the revised versions of the candidate f–structures for (40b) are indistinguishable on the basis of overall definiteness:

(70) $$\begin{bmatrix} \textsc{spec} & \begin{bmatrix} \textsc{spec} & \textsc{salient} \end{bmatrix} \\ \textsc{pred} & \text{`}\textsc{bicycle}\text{'} \\ \textsc{num} & \textsc{sg} \\ \textsc{pers} & 3 \\ \textsc{gend} & \textsc{masc} \end{bmatrix}$$

(71) $$\begin{bmatrix} \textsc{spec} & \textsc{salient} \\ \textsc{pred} & \text{`}\textsc{bicycle}\text{'} \\ \textsc{num} & \textsc{sg} \\ \textsc{pers} & 3 \\ \textsc{gend} & \textsc{masc} \end{bmatrix}$$

(71) is definite by (69i), and (70) is definite by (69ii). Since interpretation yields the same result for the entire f–structure in each case, there is no grounds for preferring one structure over the other on the basis of definiteness.

For an additional argument in favor of definiteness–by–interpretation, consider the coordination data from (Rouveret 1994:III,p. 12) in (73) and (75). Rouveret reports that it is impossible to coordinate two genitive noun phrases with different definiteness specifications:

(73) a. *Clywais gân blentyn a 'r athrawes.
hear.PRET.1SG song child and the female.teacher
'I heard the song of a child and the teacher.'

b. *Gwrandawodd y brenin ar adroddiad ysgrifennydd a 'r trysorydd.
listen.PRET the king on report secretary and the treasurer
'The king listened to the report of a secretary and the treasurer.'

However, it is perfectly acceptable to have a coordinate possessor if both conjuncts agree in definiteness:[35]

(75) cân Deborah a Barac
song Deborah and Barac
'the song of Deborah and Barac'

I think that the argument could be salvaged by appealing to the quantificational determiners like *pob* 'all' rather than the determiner. Assume the following lexical entry for *pob*:

(72) **pob:**
($\uparrow$ SPEC)= $\forall$

Given this analysis, one can construct an argument for the DP status of noun phrases such as *pob gar* 'every car' on the basis of the scope of the quantifier in f–structure. This argument is formally analogous to the argument given in section 4.2 on the basis of the scope of definiteness. However, since the exact position of determiners in c–structure is an ancillary issue to the proposed account of determiner–possessor interactions, I will not pursue this line of argument further.

[35] Rouveret also cites the following example of a licit coordinate possessor:

(74) dy waith di a Siôn
CL.2SG work PRO.2SG and John
'your and John's work'

This example is problematic, in that if there were a single coordinate possessor in this sentence, one would expect feature clashing in SPEC between the specifications carried by the pronominal clitic and the specifications carried by the possessor. This consideration suggests that perhaps the second conjunct is an elliptical NP in which the possessum has been omitted. However, a uniform analysis of all such conjunctions in terms of ellipsis does not explain the unacceptability of the sentences in (73). I will defer further consideration of this example to future work.

Suppose that we returned to using the attribute DEF to model definiteness. It is difficult to see how we will then model the definiteness restriction on coordination in possessor position seen in (73). The functional annotations on the possessor position should be indifferent to whether the slot is filled by a conjunct or a single NP/DP, so we will maintain the ($\uparrow$ DEF)= ($\downarrow$ DEF) annotation as–is. Neither one of the conjoined noun phrases is sensitive to the fact that it is in a conjunction, so the standard annotations will suffice for them. That leaves the syntactic node associated with the conjunction *a* itself as the only possible site for annotations enforcing definiteness agreement between the conjuncts. Since *a* is a general–purpose conjunction in Welsh, we would have to build a special version of this construction just for noun phrases in order to implement the definiteness restrictions.

Although appealing to a special rule of noun phrase coordination would not be in itself an unusual move to make, it is an unecessary one if definiteness is treated as an emergent property of f–structures. Faced with a conjunction of noun phrases, the operative heuristic is to interpret the conjunction as definite if both conjuncts are definite and as indefinite if both conjuncts are indefinite. If only one conjunct is definite, then the conjunction is not interpretable and is rejected. To specify this more concretely, I propose the following general condition on interpretation of conjunctions:

(76) If f–structure f_1 is a conjunction of the f–structures f_2 and f_3, then interpretation of f_1 with regard to any property α is constrained as follows:

i. f_1 is interpreted as α iff f_2 and f_3 are both interpreted as α.

ii. f_1 is not interpreted as α iff f_2 and f_3 are each not interpreted as α.

iii. Otherwise, f_1 is uninterpretable.

These constraints, in addition to the condition on definiteness interpretation proposed in (69), yield the desired results. I suspect that a more thorough investigation into the behavior of conjunctions would refine the principles in (76) further, but a general analysis of conjunction within LFG would deserve a paper unto itself.

4.5 Summary

In this section, we have developed an analysis of Welsh possessors and determiners (the article, in particular) that nicely captures features of their competitive interaction in the noun phrase, including mutual exclusion. Although these elements occupy distinct syntactic positions, their behavior falls into place if they are taken to reference the same grammatical function, SPEC, in f–structure. SPEC is proposed as a general feature for encoding information regarding the specificity of reference of nouns, thus emphasizing the common semantic function served by determiners and possessors. Analysis in terms of SPEC also affords an easy characterization of the placement of demonstrative elements in the noun phrase, and it suggests a new view of definiteness as a property that emerges from the interpretation of f–structures, rather than one which is directly encoded in them. This account of definiteness seems to work for Welsh, though it is unclear how applicable it may be to other languages.

5 Conclusion

This paper has explored two rather different issues raised by noun phrases in Welsh. Resolution of both issues has required the modification of the analytical toolkit provided by LFG, but in each case the proposed changes are consistent with the motivating principles of the formalism. The ordering of prenominal and postnominal modifiers in the Welsh noun phrase amply demonstrates the need for a mechanism to constrain the ordering of syntactic adjuncts. The proposed analysis of adjunction in terms of adjunction structures and the unification of syntactic features constitutes a wholesale extension of LFG c–structure, but one which is consistent with the principles already governing f–structure. Accounting for the interaction of possessors and determiner heads requires postulating a new grammatical function SPEC whose value ranges over both f–structures and constants such as SALIENT. This move is unusual, but within the formal specification of LFG, and its utility emphasizes one of the formalism's strengths: the explanation of interactions between syntactically distant elements via locality in f–structure. Determiners and possessors occupy locations on opposite sides of the noun head, but they both crucially reference the SPEC feature in f–structure, resulting in conflicting value assigments that enforce their mutual exclusion in the noun phrase.

In order to develop a complete analysis of the Welsh noun phrase, one would have to devote more attention to issues that were raised in the discussion and then set aside, including the semantic control of adjunct order and the modeling of quantificational determiners. The analysis of definiteness in section 4.4 raises several issues by itself, including the question of whether f–structures should be treated as strictly static objects by the syntax, or whether data from interpretation is available as well. I suggested that syntactic constructions could be sensitive to issues of interpretation, but more work is clearly needed to establish this claim.

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