ATTRIBUTIVE ADJECTIVES
AND THE NOMINALS THEY MODIFY

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Abstract

This thesis investigates the basis of frequently observed restrictions on possible orders of multiple attributive adjectives in English and French. A central claim is that theories deriving adjective orders from an extended functional sequence (Cinque 1994) are empirically inadequate and theoretically unwieldy. Indeed, there are basic conflicts between the observable basis of adjective ordering restrictions and the independent evidence concerning the nominal functional sequence (discussed in Borer 2001), and so the nominal functional sequence cannot be used to motivate adjective ordering restrictions.

With regard to the semantics of attributive adjectives, it is noted that accounts in terms of set intersection or 'θ-identification' (Higginbotham 1985) cannot account for scope effects in the interpretation of multiple attributive adjectives, as the associativity of set intersection means that scope (or, in syntactic terms, hierarchical dominance) will have no effect on interpretation. A return to the Montagovian notion of attributive adjectives as second-order functions is instead proposed. This permits a reunification of the semantics of attributive adjectives, after Higginbotham (1985) introduced a three-way division in the semantics of attributive adjectives, and straightforwardly represents scope relations in the semantics.

It is also claimed that the differences between English and French adjective orders are best accounted for by a transformational account, and the assumption of a non-uniform basis of adjectival modification within the DP. To this end, sketches of analyses of non-restrictive, focused, and "attributive–predicative" interpretations of adjectives are presented.

Contents

Chapter 1
Introduction

1.1 Structure of the thesis

The primary purpose of this thesis is to investigate the relationship between the functional structure of noun phrases and the positions of different attributive adjectives. While the nominal syntactic structure proposed should responsibly represent the semantics of noun phrases (following Abney 1987, Longobardi 1994, Zamparelli 2000, Borer 2001, Baker 2003, etc.), the particular focus of this paper is the interactions of this structure with cross-linguistically robust adjective ordering restrictions, as described in Hetzron (1978), Dixon (1982), etc, when such restrictions are considered together with well-motivated assumptions about the compositional semantics of adjectives, and about general principles of phrase structure.

The thesis is structured as follows: in the rest of the introduction, I will outline some basic facts about the patterns in which attributive adjectives occur in English and French. Chapter 2 gives some formalisations of these data within standard Principles and Parameters theory, and proposes a theory of phrase structure and of the structure of noun phrases as a starting point for an examination of adjective orders. Chapter 3 deals with English adjective orders in the light of this theory, before turning to the arguably more complex case of French in chapter 4.

Of course, a vast amount is beyond the scope of this paper. The overall conception of attributive adjective orders which I would envisage is one of a number of independent but interacting syntactic and semantic factors which constrain essentially free adjective merger[1], as opposed to past views which have sought to motivate all ordering restrictions on the basis of a view of AdjPs as specifiers of rigidly ordered functional heads. Cinque (2003) discusses many such factors, and finds intriguing correlations between the pre- or post-nominal position of an adjective in English and Romance, and the adjectival semantics which are potentially available in these positions. This thesis will, however, largely be restricted to general discussion of factors affecting the relative order of intersective, subsective and modal adjectives, in mass and count noun phrases, along with some remarks concerning more marked adjectival constructions. The discussion is restricted to object-denoting nouns, to attributive adjectives, and to English and French. Of course, the hope is that this conception of adjectival modification will be more widely applicable. How far this can be extended to other uses of adjectives (e.g. predicative uses), to other types of nominal (such

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[1]Or perhaps, as was proposed for clausal adjuncts in Frey (2003), adjunction which is partially syntactically constrained, with further semantic constraints on ordering and interpretation.

as event nominals) or to other languages (where much typological literature claims a great variety in the number, and function, of adjectives), remains, however, very much a matter for future research.

I turn now to a presentation of the basic facts concerning attributive adjectives which I hope to explain in this thesis.

1.2 This much we know

1.2.1 Attributive adjectives are optional

This is, in many ways, a hallmark of adjunction. By "optional", I mean that an Adj–N structure will have exactly the same distribution as the noun on its own. The syntactic properties of a noun, however we may formulate them, are essentially unchanged by merging an adjective, so (1a) is just as admissible as (1b):

(1) a. '[The [sky]] fell on his head.'

    b. '[The [cloudless [sky]]] fell on his head.'

1.2.2 Attributive adjectives can be merged recursively

This follows largely from section 1.2.1 above. As merging an adjective has no discernible effect on the syntactic properties of the noun, there is nothing about merging an attributive adjective which should have any bearing, syntactically, on whether or not a further attributive adjective is then merged. Attributive adjectives can then be merged, successively, within the same noun phrase, *ad infinitum* (at least theoretically). The following examples support this position:

(2) a. 'Rip-offs'

    b. 'Childish rip-offs'

    c. 'Blotchy childish rip-offs'

    d. 'Obvious blotchy childish rip-offs'
       Etc...

1.2.3 Relative adjective order is not entirely rigid

This can be seen from searches on www.google.com, where acceptable DPs can often be found which include a given pair of attributive adjectives in either order. I give an illustration below:

(3) a. 'red circular': 3,870 hits on google
       e.g. 'a red circular collector's seal'.

    b. 'circular red': 2,140 hits on google
       e.g. 'a circular red light'.[2]

Both of these examples are utterly innocuous, and the frequencies of the two adjective orders are close enough to assume that ordering of these two adjectives is, to all intents and purposes, free.

1.2.4 Relative adjective order is not entirely free

If there is a significant amount of variation in relative orders of multiple attributive adjectives, these orderings are clearly not entirely free. I give below the relevant frequencies for 'big' and 'circular':

(4) a. 'big circular': 2,870 hits on google
      e.g. 'a big circular drum'.

   b. 'circular big': 108 hits on google
      e.g. ? 'a circular big pillow on a wall'.[3]

When one order is at least 25 times as frequent as the other on google, and the less frequent order may not have any acceptable examples, we must conclude that ordering of these two adjectives is, to all intents and purposes, fixed.

1.2.5 Scope is relevant to attributive adjective interpretation

Svenonius (1994) discusses the examples in (5) below:

(5) a. '[Chopped [frozen [chicken]]]'

   b. '[Frozen [chopped [chicken]]]'

Although the relevance of scope to attributive adjective interpretation may usually be obscured, the use of adjectives with salient associated events clearly shows the influence of scope. Specifically, in (5a), we interpret the phrase as chicken that has been frozen, and then subsequently chopped, while the opposite order of events is inferred from (5b).

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[2]Of course, not every occurrence on google of an Adj–Adj sequence will represent an admissible piece of English, and not every occurrence will represent a series of attributive adjectives modifying a noun. Google does, however, give us a broad idea of admissibility and relative frequency of specific adjective orders.

[3]This really is the most readily acceptable example on google, of only around 5 actual occurrences of 'Circular big N' DPs.

1.2.6   French and English show related, but different, patterns of attributive adjective ordering

The clearest divergence between French and English, in terms of attributive adjectives, is that French allows post-nominal attributive adjectives much more freely than English. While there are cases of post-nominal adjectives in English, post-nominal position is generally related to the structure of the AdjP (an Adj with a PP complement will obligatorily occur post-nominally, as in (6)) or to a "predicative" interpretation of the Adj in question (as in (7), for now treating the notion of "predicative" as intuitively given by the accompanying paraphrases):

(6) a. 'A [proud] father'

   b. * 'A [proud [of his sons]] father'

   c. 'A father [proud [of his sons]]'

   d. ?? 'A father [proud]'

(7) a. 'The [present] members' — 'The people who are presently members'

   b. 'The members [present]' — 'The members who are present'

In French, the post-nominal position is available in these two contexts, but this is also the usual position for many classes of attributive adjectives without PP complements, as seen below:

(8) a. Colour: 'Un chou   blanc'
                'A   cabbage white'
                'A white cabbage'

   b. Nationality: 'Des   touristes allemands'
                'Some tourists   German'
                'German tourists'

   c. Shape: 'La   maison carrée'
                'The house   square'
                'The square house'

For Waugh (1977), these patterns can be captured, somewhat pre-theoretically, as follows:

> 'An adjective in [post-nominal] position (minimally and invariantly) modifies the substantive *qua* substantive, i.e., as a part of speech. . . [But] whenever an adjective occurs in pre-position, it modifies the substantive not simply as a part of speech, but as a substantive with a specific lexical meaning as well' (Waugh 1977, pp.94-95).

Furthermore, a post-nominal adjective is felt to have a 'predicative nuance', because 'predication *implies* "independence" of the adjective from the substantive' (Waugh 1977, fn.191, p.121).

I will assume that this semantic difference is related to the traditional distinction between "intersective" and "non-intersective" adjectives. The major difference between English and French adjective orders is that those French post-nominal adjectives which cannot appear post-nominally in English are interpreted "intersectively", or in some way more "absolutely" than their pre-nominal counterparts[4]. On the other hand, only non-intersective readings (subsective, modal, non-restrictive, etc.) are available pre-nominally in French. I will return repeatedly to this matter, concerning both English and French, below, and raise some qualifications concerning the intersective–subsective distinction, but, as a first approximation, I will claim that the difference between English and French post-nominal adjectives resides in the fact that, in addition to the post-nominal possibilities in English, French places an adjective with an intersective, or in some sense more absolute, interpretation, post-nominally.

A second distinction is that scope applies in a mirror order in French post-nominal adjectives, compared to English pre-nominal adjectives. This is shown in the following pair, from Bouchard (2002):

(9) 'Des   [[[mesures] techniques] brutales]'
    Some measures   technical   brutal'
    [Brutal [technical [measures]]]

This concludes a brief exposition of some of the more important facts concerning English and French attributive adjectives. I turn now to setting up a theoretical framework within which to discuss these facts.

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[4]In other words, they are closer to being 'extensional' adjectives, in the sense of Kamp (1975).

Chapter 2
DP structure and adjective syntax and semantics

Although further relevant data will be introduced in the course of this paper, the data in the preceding sections broadly define the area in need of explanation. Already, within a Principles and Parameters framework, some initial generalisations concerning adjectives spring from the data. The first three sections in this chapter will outline some of these, while the following two sections spell out my assumptions concerning the functional structure of DP.

2.1 Syntactic subclasses of attributive adjectives are not determined on narrowly conceptual grounds

Below are some further data from google. These data point to the existence of two subtypes of adjective, corresponding to the traditional categories "intersective" and "subsective", which are rigidly ordered relative to each other, but freely ordered within each category. A third subtype, "modal" adjectives, are not so rigidly ordered but show preferences for certain orders relative to the other classes. These adjectival classes are all recognised as significant within the generative literature since at least Vendler (1968). I will now describe the intuitive basis of the distinctions between them.

Firstly, modal adjectives are distinguished from the subsective and intersective classes in that we cannot infer that the property denoted by the noun holds of the Adj–N group. Examples are in (10):

(10) a. 'The alleged spy'

  b. 'A future president'

  c. 'A fake gun'

  d. 'A non-starter'

(10a) shows a simple case in which the 'alleged' spy may or may not be a spy. (10b) arguably denotes someone who is not currently a president, but will be in the future. (10c) perhaps shows an Adj–N cluster which *cannot* refer to the same thing as the N alone, as does (10d), if 'non-' can be analysed as a modal adjunct, as I would argue.

Turning to subsective adjectives, it is traditionally thought that this class requires interpretation relative to a comparison class, in some sense, in order to be meaningful. So 'big' is clearly recalibrated between (11a) and (11b), as is 'old' between (12a) and (12b):

(11) a. 'A big hamster'

b. 'A big planet'

(12) a. 'An old hamster'

b. 'An old planet'

A 'big hamster' is big for a hamster, but probably quite small for a planet, while a 'big planet' is big for a planet.

As for intersective adjectives, these are traditionally considered to be in some sense more "absolute" than subsective adjectives. So, unlike the examples in (11–12) above, the adjectives in the following examples arguably do not recalibrate to the same extent[5]:

(13) a. 'A blue hamster'

b. 'A blue planet'

(14) a. 'A circular hamster'

b. 'A circular planet'

(15) a. 'An iron hamster'

b. 'An iron planet'

If these distinctions are widely recognised in the literature, we must immediately note, following Bouchard (2002), that the intersective / subsective distinction, as presented above, is not watertight. Firstly, it is clear that the interpretation of 'red' in (16) is relativised to the noun it modifies, as a red face is not the same colour as a red bus. Secondly, the existence of completely natural predicative uses of subsective adjectives, devoid of any overt source of a comparison class, as in (17), suggests that these adjectives are capable of being interpreted in a way which is, in some sense, more absolute:

(16) a. 'A red face'

b. 'A red double-decker bus'

(17) 'That is big.'

I will now show how these classes of adjective are ordered relative to each other. I will illustrate this with several examples of each of these types of adjective. Representing intersective adjectives, I will consider typical examples of material ('wooden'),

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[5]See Vendler (1968) for an early transformational account of these differences, or Kamp (1975) for a more formal semantic treatment of the distinctions.

origin ('French'), colour ('red'), "similarity" ('feline')[6] and shape ('circular') adjectives. It seems that any of these classes can be found preceding or following any other (all examples from www.google.com):

(18) a. 'Wooden French wine crates' — 'French wooden carriage clock'

b. 'Wooden red clock' — 'red wooden shoes'[7]

c. 'Wooden feline effigy' — 'canine wooden cutouts'

d. 'Wooden circular pedestal' — 'Circular wooden platform'

e. 'French red wine' — 'dark green French marble'

f. 'French feline press' — 'feline French road movie'

g. 'French circular occasional table' — 'circular French desk'

h. 'Green feline eyes' — 'feline green eyes'

i. 'Circular red patch' — 'red circular collector's seal'

j. 'Grotesque circular feline mask' — 'feline oval pupils'

Although there is occasionally a numerical preference for one order over the other (in particular, 'French green' generated 22,500 hits, compared to only 2,380 for 'green French'), generally the two orders are somewhere near equally frequent, and it is clear that in any case, either order can be found at least occasionally in quite natural examples. On the view that the grammar should determine all and only grammatical expressions, and as we are dealing with statistical preferences rather than clear prohibition of one order, it is sounder to assume that the factors at work favouring one order over the other are not strictly grammatical in nature. The conclusion from 18, then, is that among these five classes of intersective adjective, any order is possible, at least sometimes, with at least a reasonably natural result.

Above these, certain classes of prototypically subsective adjectives regularly appear further from the noun than the intersective adjectives. The classic subsective adjective is 'big', and in addition, I will consider 'new'. In each of these cases, and with all of the above intersective adjectives, it is easy to find examples of subsective > intersective order:

(19) a. 'Big wooden bird' — 'New wooden floors'

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[6]One of the classes proposed in Vendler (1968), with rather less clear results here than the others, perhaps because of its relative rarity and the polysemy of 'feline'.

[7]Note also an advert for 'Handcrafted wooden red oak hutch furniture', with a material adjective either side of the colour adjective.

   b. 'Big French bronze sculpture' — 'New French strikes'

   c. 'Big red dog' — 'New red dress'

   d. 'Big feline corpse' — 'New feline tracks'

   e. 'Big circular barbells' — 'New circular platform'

The inverted orders, however, although not unattested, are decidedly marked, or even altogether bad:

(20) a. ? 'Wooden big office desks' — 'Wooden new doll's house accessory'

   b. ? 'The French big bazaar' — ?? 'French new ambassador'

   c. * 'Red big N'? — 'Red new potatoes'[8]

   d. 'The canine big leagues'[9]— 'Feline new breeds'

   e. ?? 'Circular big window' — ?? 'Circular new procedures'

On the other hand, ordering of 'new' and 'big' is relatively free (105,000 hits for 'new big', as opposed to 82,800 for 'big new'), as shown by the following examples:

(21) New big idea — Big new world

This shows that at least adjectives referring to properties of shape, colour, origin / nationality and material are freely ordered among themselves, as are size and novelty adjectives among themselves[10]. However, these two classes are rigidly ordered relative to each other, with the latter regularly dominating the former. If size does not pattern with shape, with which it would appear to have clear conceptual links, but does pattern with apparently conceptually unrelated novelty adjectives, it is highly unlikely that strictly conceptual (as opposed to formal or structural) properties could be solely responsible for determining adjective order.

A rather less simple pattern emerges with a third class of adjectives, the "modal" adjectives. Although there is a strong tendency for these adjectives to precede the

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[8]There were 8,760 hits for 'red big' but no acceptable DPs among the first 50, and there's a limit to my patience when it comes to trawling through google. Of course, it is quite easy to invent examples such as 'the red big top', but examples with non-idiomatic uses of 'big' are harder, if not impossible, to come by. Similarly, there were 28,400 hits for 'red new', but all acceptable ones involved idiomatic uses of 'new'.

[9]There were no examples of 'canine big' or 'feline big' which did not include 'big' as part of some more idiomatic construction.

[10]These categories of adjectives, with the exception of "novelty", are all suggested as structural classes of adjective by either Cinque (1994) or Scott (1998).

other classes discussed above (some examples are given in (22) below), there are also several examples, particularly from more technical or scientific sources, where the opposite order is quite naturally used (see (23) below):

(22) a. '12,000 apparent red rice seeds'

   b. 'Obvious childish rip-offs'

   c. 'Possible red flag'

(23) a. 'Eight childish obvious forgeries'

   b. '320 tonnes of red possible volcanic ash'

These facts can mainly be accommodated within the hierarchy of adjective types in (24). More clearly needs to be said about the examples in (22–23) above, to which I return in section 3.3 below, but this is an approximate description of the ordering facts exemplified in (18–23) above:

(24) $\text{Det}> (\text{Adj}_{modal}) >\text{Adj}_{subsective} > (\text{Adj}_{modal}) >\text{Adj}_{intersective} > (\text{Adj}_{modal}) >\text{Noun}$

The model developed below will show that a cluster of factors are responsible for these approximate ordering restrictions, and this thesis will also consider some other factors influencing adjective orders.[11]

The challenge here, then, is to find a principled basis for the intersective–subsective distinction (because the ordering facts are more than robust enough to require one), and to motivate the approximate description in (24).

2.2   Adjectives are not specifiers in a Cinquean hierarchy

Cinque's (1994, 1999) influential work on adjective and adverb orders proposed a conception of many adjuncts as specifiers of unique functional heads. In particular, he proposed the following hierarchies for attributive adjective positions within DP:

> '*Serialisation of adjectives in event nominals*:
> poss > cardinal > ordinal > speaker-or. > subj.-or. > manner > thematic
> *Serialisation of adjectives in object-denoting nominals*:
> poss > cardinal > ordinal > quality > size > shape > colour > nation.'
> (Cinque 1994, p.96)

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[11]However, many other factors relevant to adjective ordering restrictions will be outside the scope of this thesis, such as those discussed in Larson (1999) and Cinque (2003). Cinque and Larson show that the Individual-Level / Stage-Level distinction constrains possible adjective orders and interpretations. Cinque also correlates this with a large amount of other distinctions in the syntax and semantics of adjectives. Furthermore, it appears that Ernst's (2002) adverbial Fact-Event Object Calculus is also active to some extent in the DP, although it has a much more limited effect on potential adjective orders than on adverb orders.

The object-denoting hierarchy was subsequently vastly elaborated by Scott (1998), to give the following:

> 'Determiner > ordinal number > cardinal number > subjective comment > ? evidential > size > length > height > speed > ? depth > width > weight > temperature > ? wetness > age > shape > colour > nationality/ origin > material > compound element > NP' (Scott 1998, p.86).

It is not entirely clear from Cinque (1994) whether we should conceive of the heads which intervene between each category as being heads directly related to size, subject-orientation, and so on, or whether we are to take these categories to be reflexes of some more abstract, undiscovered, functional heads. The issue is, however, largely irrelevant here, as either option clearly undergenerates adjective orders, if compared to data from google. Concentrating on object-denoting nominals, the data in section 2.1 shows that any order of the lowest three categories, shape, colour and nationality, is routinely possible, and this finding is corroborated by the data in Malouf (2000), which shows, on the basis of a study of the British National Corpus, that ordering relations among pairs of adjectives are not strictly transitive.

Of course, such data can be accommodated within a model of adjectives as specifiers of a rigid hierarchy of functional heads. If we assume that shape adjectives are specifiers of functional head A, colour adjectives of functional head B, and nationality adjectives of functional head C, then we can either conceive of a recursion of these three heads, as in (25a), or a more extended series of functional heads, as in (25b), with absolute (and apparently coincidental) homophony and synonymy between potential specifiers of A, D and G; B, E and H; and C, F and I:

(25) a.

```
A
(shape)    B
        (colour)    C
                (nation.)    A
                        (shape)    B
                                (colour)    C
                                        (nation.)    A
                                                (shape)    B
                                                        (colour)    C
                                                                (nation.)    NP
```

b.

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A
(shape)    B
        (colour)    C
                (nation.)    D
                        (shape)    E
                                (colour)    F
                                        (nation.)    G
                                                (shape)    H
                                                        (colour)    I
                                                                (nation.)    NP
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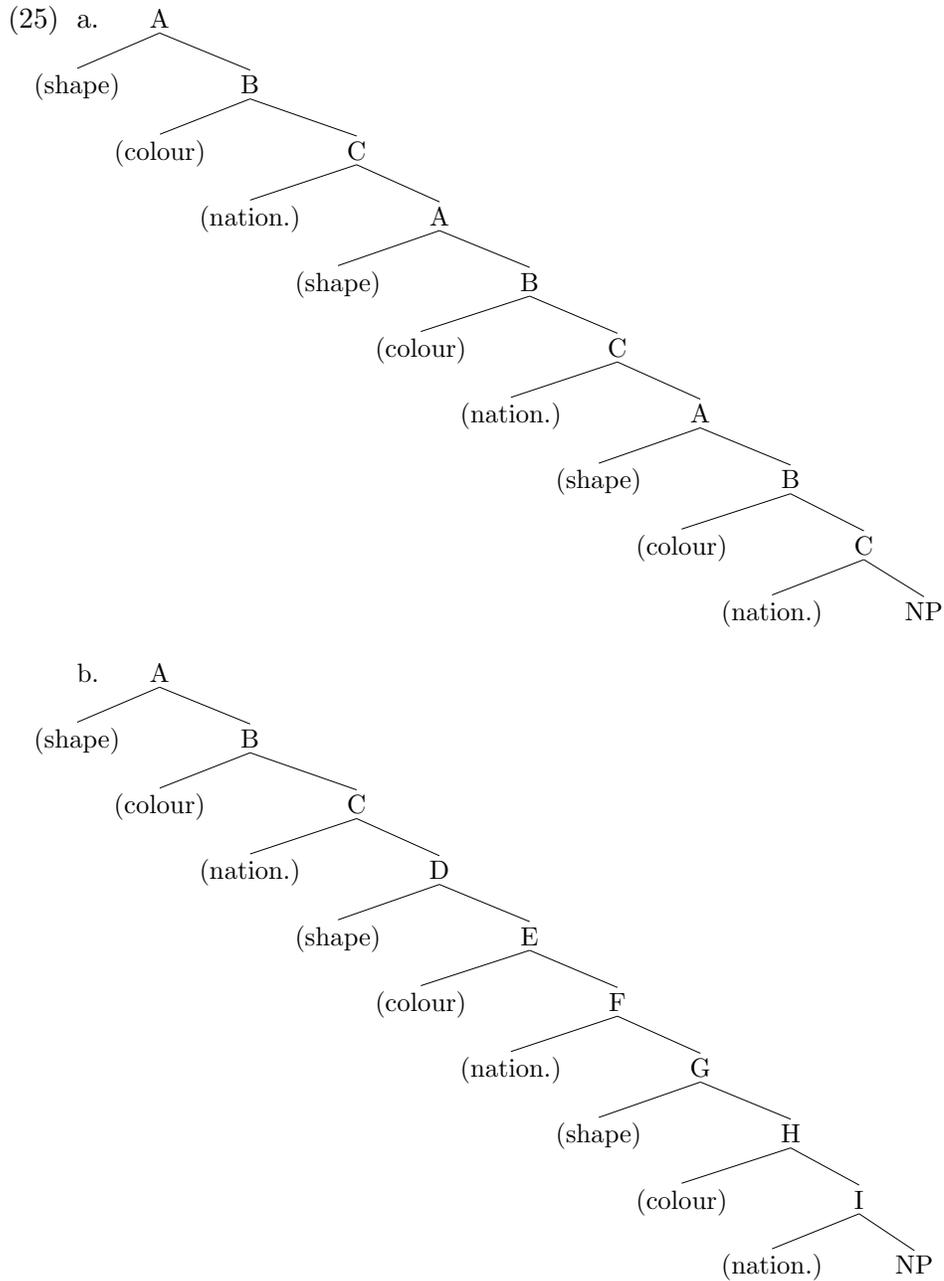
By this point, however, there is already massive redundancy in the representation. We should expect such redundancy to grow further in the case of Scott (1998), where similarly free relative ordering of many of the categories is found in google searches. Furthermore, the nature of all these extra functional heads raises several questions. The two most obvious are: how could we account for the multiple identical functional heads in (24); or how can we account for the homophony and synonymy between members of the classes of potential specifiers for distinct functional heads in (25). Both of these are critical questions, and I believe there is no satisfactory answer to
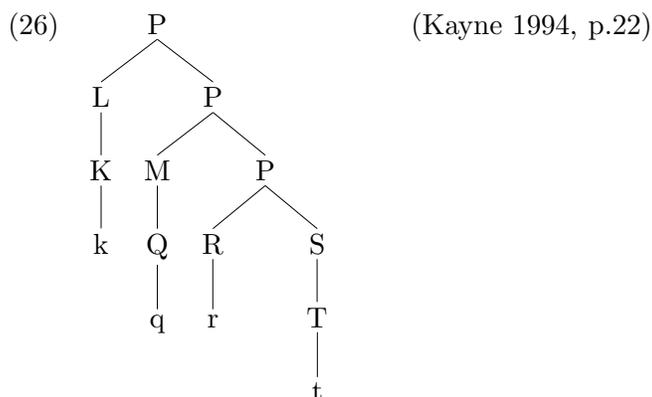
either. In that case, adjectives are at least not generally specifiers ordered by their relationship to a fixed sequence of different functional heads, as Cinque and Scott, among others, would propose.

Consideration of Cinque (1994) and Scott (1998) also offers further support to the move away from conceptually based classifications of adjectives. Cinque's hierarchy is one third of the size of Scott's, primarily because it includes what appears to be a "dustbin" category, 'Quality'. Scott's exclusion of this category leads to a massive expansion in the size of his functional hierarchy, but also in the heterogeneity and apparent arbitrariness of that hierarchy. Despite his decomposition of Cinque's 'size' into four or five categories (split either side of 'speed' with no explanation), the superordinate term 'size' still has to be included, in order to allow for more general adjectives such as 'big'. Similarly, several categories are only tentatively included, for example, 'evidential', in order to deal with cases with two apparent 'subjective comment' adjectives ('a really {famous boring / boring famous} book') — although, as Scott acknowledges, this is not a problem restricted to the 'subjective comment' category (other examples include 'a {thick fat / fat thick} book' — both 'width' — and 'a {modern new / new modern} kitchen' — both 'age'). 'Wetness' and 'depth' appear to be only tentatively included because they seem quite anomalous as heads of quasi-functional projections (Scott notes that 'The problem with proposing new categories is, of course, where does one stop?. . . Does this really mean one should even go so far as to posit a "WetnessP" for example (!!!) ?' [Scott 1998, fn. 21]). Other proposed adjectival categories are excluded from the hierarchy, for no clear reason ('difficulty', as proposed by Dixon 1982, or 'physical defect', after Hetzron 1978). Of course, as Scott acknowledges, it is verging on the ridiculous to propose to include such categories in a hierarchy, because it makes obvious the very bitty nature of the proposal, but leaving them out drastically weakens the empirical coverage of his system. Such problems appear to be inevitable in a system which bases its adjectival classes on conceptual criteria.

If attributive adjectives are not specifiers in a Cinquean model, then there are three major possibilities under standard conceptions of phrase structure: either they are specifiers in an NP-shell structure[12], they are heads taking NP complements, following Abney (1987), or they are adjuncts, in the sense of, for example, Chomsky (1995, 1998), where adjuncts have a distinct structural relationship with their

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[12]I distinguish specifiers in shell structures from specifiers of a Cinquean functional hierarchy, because specifiers in shell structures are all in a Spec–head relationship to the *same* functional head, and so the nature of this head cannot be used directly to motivate ordering restrictions, as it is in Cinque's model.

sisters from that of non-adjuncts. This latter proposal is, in itself, controversial in the current syntactic climate. The Linear Correspondence Axiom of Kayne (1994) provides a highly restrictive theory of phrase structure, in which a specifier is an adjoined position. However, multiple adjuncts in the same projection would lead to the following configuration:

(26)   P   (Kayne 1994, p.22)

```
(26)              P
               /     \
              L       P
              |      /  \
              K     M    P
              |     |   /  \
              k     Q  R    S
                    |  |    |
                    q  r    T
                            |
                            t
```

This configuration is illegal under the LCA, because the two adjoined phrases, L and M, asymmetrically c-command Q and K respectively, under Kayne's definition of c-command, and so there is no way to determine the relative order of the terminals k and q, and the representation is illegal.

Moreover, in Brody's (2000) Mirror Theory, there is simply no way to express an adjunction relationship: there is only one primitive relation, which is specifier-head, and this relationship is biunique.

All three analyses, of attributive adjectives as true adjuncts, as heads, or as specifiers in an NP-shell structure, have their adherents, and there are also many hybrid proposals. This is unsurprising, given the diversity of theoretical standpoints concerning the syntactic and semantic nature of a specifier, head, complement and adjunct. I will argue below for a hybrid analysis, with potentially better empirical coverage than any one of these three analyses alone.

It should also be noted that considering other types of analysis does not entail walking away from the notion of a highly articulated functional sequence in the DP. It is quite possible to conceive of attributive adjectives merging within one of a number of functional projections, which would restrict potential adjective orders, while the nature of these structures would remove the restriction on one phrasal slot per functional head. As well as the structural nature of attributive adjectives, then, this thesis will examine the influence, or lack thereof, of a nominal functional
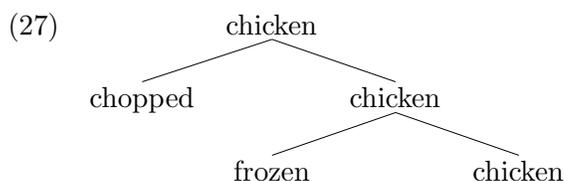
sequence on adjective orders. I will return to these endeavours below, having first detailed some further basic assumptions about attributive adjectives.

2.3 The semantic basis of attributive adjectival modification is not set intersection

A common view of the semantics of intersective adjectives is that, like nouns, they are of property-denoting type $\langle e,t \rangle$[13]. So, as the word 'car', in isolation, denotes the set of entities that have the property of being cars, so 'red' denotes the set of entities that have the property of being red. An intuitive way of capturing the semantics of the Adj–N group 'red car', then, is as the intersection of these two sets (hence the name "intersective" adjectives).

We now have two reasons to be sceptical about this claim. Firstly, we saw in section 2.1 that there is no clear divide between adjectives which are interpreted absolutely and adjectives which are interpreted relative to the noun they modify (subsectively). It is not clear that the model of set intersection is particularly well suited to subsective modification, as subsective modifiers are only really meaningful relative to a comparison class, and so don't independently denote a set which can intersect with the set denoted by the property expressed in the noun. This is even more clearly true in the case of modal adjectives, because, as we saw above, not everything denoted by an Adj_{modal}–noun compound is in the denotation of the noun in isolation.

Secondly, set intersection is an associative function, and as such, there is no clear way to represent the scope effects discussed in section 1.2.5. If, simplifying, the syntax for (5a) were as in (27), and adjectival modification were set intersection, we might expect the semantics of the Adj–Adj–N group to be as in (28):

(27)
```
              chicken
             /       \
       chopped       chicken
                    /       \
               frozen       chicken
```

(28) $\lambda x.[\text{chopped}(x) \,\&\, [\text{frozen}(x) \,\&\, [\text{chicken}(x)]]]$

Given the associativity of set intersection, however, this semantics is identical to the bracketing in (29), which bears no relation to the c-command relations among

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[13]Here, and throughout this thesis, I ignore issues of intensionality and extensionality, for clarity of exposition.

the constituents, or even, essentially, the unbracketed (30), in that the order in which the elements are conjoined is irrelevant to the eventual denotation of those elements:

(29) $\lambda x.[[[\text{chopped}(x)] \,\&\, \text{frozen}(x)] \,\&\, \text{chicken}(x)]$

(30) $\lambda x.\text{chopped}(x) \,\&\, \text{frozen}(x) \,\&\, \text{chicken}(x)$

As set intersection is associative, any bracketing of conjoined elements representing c-command relations among constituents is inadequate as a representation of the scope relations among these elements that we saw in (5), as the order in which the adjectives are merged affects the interpretation, but the order in which set intersections are performed has no effect on the eventual set denoted.

We have, then, two good reasons to reject set intersection as a basis of adjectival modification[14]. Instead, I propose to generalise a standard representation of modal adjectives (in (31)) to cover all attributive uses (as in (32), for example):

(31) a.   problem
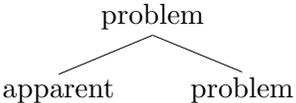
          apparent   problem

   b. $\lambda x.[\text{apparent}\,[\text{problem}(x)]]$

(32) a.   car
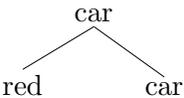
         red   car

   b. $\lambda x.[\text{red}\,[\text{car}(x)]]$

This semantic representation, already present in Kamp (1975) and other works in the categorial grammar tradition but frequently ignored by more recent authors, following e.g. Higginbotham (1985), straightforwardly reflects scope effects. However, a primary reason why such a representation is often adopted for modal adjectives only is that it disrupts traditional patterns of inference: we cannot infer 'apparent' or 'problem' from 'apparent problem', yet we arguably want to be able to infer 'red' and 'car' from 'red car'.

We must, however, note that these two inferences are rather different from each other. I propose, given the suggestion in section 2.1 above that even the semantics of "intersective" adjectives is relativised to the noun group it modifies, that an

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[14]Others are discussed in Kamp (1975).

automatic inference from $\lambda x.[\text{Adj}[\text{N}(x)]]$ to $\text{Adj}(x)$ is undesirable, and that such an inference is inductive / abductive in nature. No-one is seriously going to suggest that 'white wine' is white, for example.

This is even more clearly the case in the following French examples from Waugh (1977):

(33) Un mangeur furieux — Un menteur furieux
      An eater   furious — A   liar   furious
      'An angry eater' — 'An angry liar'

(34) Un furieux mangeur — Un furieux menteur
      A   furious eater   — A   furious liar
      'A manic / compulsive eater' — 'A manic / compulsive liar'

(35) Ce   mangeur / menteur est furieux
      This eater   / liar   is   furious
      'This eater / liar is angry' $\neq$ 'This eater / liar is manic / compulsive'

These examples show that 'furieux' can occur with 'mangeur' and 'menteur' in either pre- or post-nominal position. However, when used predicatively, for example in a copular construction as in (35), it only has the meaning associated with the post-nominal position. This, then, is a clear (and quite productive) case where the semantics of an adjective used predicatively or attributively differ significantly: we apparently can't deduce 'Il est furieux' from 'Il est un furieux mangeur', and so any model of such inferences as automatic is problematic.

As for the fact that we must not be able to infer 'problem' from 'apparent problem' (not even inductively / abductively), we must note a difference in the denotations of modal and non-modal adjectives. This is that, while non-modal adjectives modifying a noun always return a subset of the denotation of that noun[15], this is not the case with modal adjectives, which return a subset of a superset constructed on the basis of the intension of the (Adj–)N group they modify (as a step towards a generalisation over the different types of modal adjective discussed in (10)). The impossibility of inferring 'problem' from 'apparent problem' then follows straightforwardly from the semantics of 'apparent', while nothing in the semantics of non-modal adjectives prevents such an inference.

I therefore suggest that neither of these problems with patterns of inference presents a serious threat to the representation in (31–32), which I adopt. I will

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[15]Though not necessarily a proper subset, given the possibility of non-restrictive interpretations of adjectives, as discussed in Cinque (2003) and in section 4.4.2 below.

return later to a formalisation of exactly what this representation means, but, first, I will turn my attention towards the structure of noun phrases.

2.4   Noun phrases contain referential indices (but these are not fixed at the level of the noun)

Baker (2003) argued convincingly for a fundamental difference between verbs, nouns and adjectives, in that only verbs license specifiers, only nouns bear a referential index, and adjectives do neither. I adopt a modified version of his proposed referential index here, to distinguish between common nouns and other elements of type $\langle$e,t$\rangle$.

The bipartite referential index consists of a unique index for each nominal, plus an index shared with another element of the discourse (a verbal argument position, or an antecedent nominal, for example), as a guarantee of a certain discourse coherence and an enabler of referent tracking through the discourse. It is argued, convincingly, that the semantic correlate of the referential index, a 'criterion of identity, whereby [nouns and only nouns] can serve as standards of sameness' (Baker 2003, p.95), makes nouns uniquely suited among the lexical categories to being used for referent tracking through a discourse, as this essentially involves presupposing that two expressions refer to the same element, which is only possible if there is some 'standard of sameness'.

Baker presents the referential index as an inherent part of the N^0, but acknowledges in a footnote that it is possible for his proposal to accommodate Marantz's (1997, 2001) postulated category-neutral lexical layer: 'My work can. . . be harmonised with. . . Marantz's by saying that I have given the theory of the grammar of *n*, *a* and *v*, rather than N, A and V' (Baker 2003, fn.2, p.269). It is a position more along those lines that I intend to adopt here, in the sense that I propose a structurally-based definition of the referential index, partially equivalent to Marantz's *n*. The convincing arguments in Marantz (1997, 2001) for a category-free lexical root should make us wary of associating any specifically nominal features (such as the referential index) with the lexical root.

More importantly, though, it is clear that the referential index, as presented by Baker, is not only a property of the noun root. This is seen most clearly in the case of modal adjectives, as discussed in section 2.3. Here, any referential index fixed at the level of the N^0 root will clearly run into problems, as not everything which can be referred to by an Adj_{modal}–N structure is in the denotation of the noun alone (as discussed with reference to (10) above).

In this case, we must divorce the notion of the referential index from the lexical item, and move towards a more dynamic notion of reference. Specifically, the model of attributive adjective modification I want to present is one whereby merging an adjective is, in most cases, equivalent to creating a new nominal property by combination of the AdjP and its sister phrase. I will sketch the mechanisms behind this combination below, after presenting a modification to Baker's version of the referential index.

2.4.1 The referential index is not atomic

As things stand, there is something dubious about a structural reworking of the referential index, precisely because it is bipartite, introducing two indices, and these two indices have quite different (perhaps complementary) functions. One index is uniquely assigned to each nominal, and defines a standard of sameness on the basis of the lexical semantics of the nominal; and one index is shared with some other index elsewhere in the discourse, and must not, therefore, be unique.

As well as the semantic distinctions between these two indices, there is the syntactic oddity of associating two variables with a single functional head. There is, as far as I am aware, nothing forbidding this in principle, but a biunique relationship between variables and functional heads appears to be at least an emergent generalisation, both in the DP and in the clause. This is explicit in Borer (2001), and is also becoming familiar from more mainstream articulated clausal phrase structure theories, where it may be proposed, for example, that merging a "verbalising" head provides a slot for a PATIENT argument, and merging a "causativising" head provides a slot for an AGENT argument, while higher heads may be related to tense, aspectual or modal variables, for example. It seems that a one-to-one relation between functional heads and variables is a plausible and restrictive working hypothesis, and one which I will develop in the appendix.

In that case, we should consider separating the atomic referential-index-bearing n suggested above into two separate heads. Specifically, I propose the following provisional DP structure:

(36)

```
          Det
         /   \
        /     \
      Ref      \
         \      \
          Same    NP
```
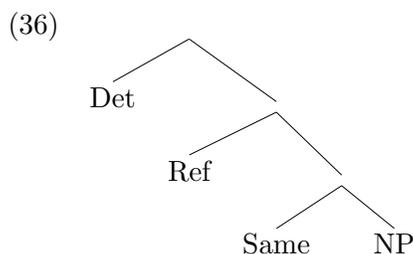
Here, between the determiner layer and the lexical layer, we have two functional heads. Firstly, there is Same[0]. This is closest, functionally, to Marantz's n. It immediately dominates, and closes off, the lexical layer; and it is uniquely nominal. In terms of Baker's conception, this head assigns a unique index to its sister that determines a standard of sameness.

Secondly, there is Ref[0]. This is the second element of Baker's referential index, and operates as a regulator of discourse coherence by allowing referent tracking through the discourse. This head is close, in other respects, to the KI[0] of Zamparelli (2000): it is the point at which modification of the nominal property ends, and so arguably the lowest level at which we can plausibly introduce the notion of a Kind, in the sense of Carlson (1977). This amounts to equating the possibility that a constituent can serve as a referent to be tracked through the discourse, with Carlson's intuition that a bare plural is 'the proper name of a kind of thing' (Carlson 1977, p.iii). This seems correct, given that a noun alone can serve as a Kind, in Carlson's terms, as can an Adj–N group. In an Adj–N group, the noun alone would have been admissible as the proper name of a Kind, but instead, the proper name of the Kind in question was not fixed until after the adjective had merged. It therefore seems reasonable to associate the notion of a Kind with a distinct syntactic position, and to note that what is new at that level is the "naming" function: if naming is a way of bringing something into the discourse, then it is reasonable that the level at which a Kind is named should also be the level at which referent tracking at the discourse level becomes possible.

Ref[0] is not, however, uniquely nominal, as there are elements, such as pronouns and CPs, which can be readily enter into the type of anaphoric relation which is key to the notion of referent tracking, but which do not have any nominal structure[16].

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[16]The structure of a pronoun could then be, perhaps, as follows:
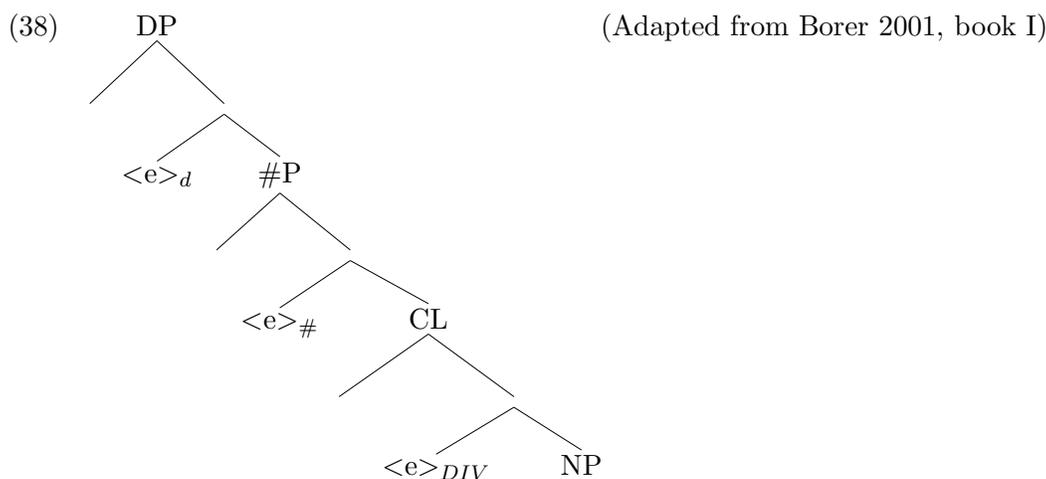
(37)

```
      /\
     /  \
   Det   Ref
```

Alternatively, we may not wish to claim that pronouns have their own referential index, and instead

Before turning to the interaction of this structure with adjectives, I will first adopt a further proposed articulation of the structure of noun phrases.

2.5 Further DP-internal functional structure

Since Abney (1987) proposed that noun phrases are actually DPs, increasing the apparent similarity between nominal and clausal functional structure, standard conceptions of the clause have involved an increasingly articulated functional sequence. Similarly, within the DP, several papers have proposed that the $D > N$ proposal is not empirically sufficient. Many papers have proposed a split DP layer[17], but relatively few have paid much attention to the functional structure of the lower DP. At least in English and French, this lower field is where any direct (in the sense of Sproat and Shih 1991) attributive adjectival modification presumably occurs, and so this is where the DP-internal functional structure has most interest for this paper.

One detailed and plausible proposal for this lower functional structure is found in Borer (2001). The structure she proposes is as follows:

(38)   DP   (Adapted from Borer 2001, book I)

$$
\begin{array}{c}
\text{DP} \\
\diagup \quad \diagdown \\
<\!e\!>_d \quad \text{\#P} \\
\quad\quad \diagup \quad \diagdown \\
\quad\quad <\!e\!>_\# \quad \text{CL} \\
\quad\quad\quad\quad \diagup \quad \diagdown \\
\quad\quad\quad\quad <\!e\!>_{DIV} \quad \text{NP}
\end{array}
$$

Borer proposes that the NP layer, where all non-functional lexical items are intro-

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that they are interpretable solely through their definite determiner layer, with its presupposition of an antecedent with a Ref[0] layer, with which it could be anaphorically linked. There are clear links in such a sketch to Cardinaletti and Starke (1994), although my proposed noun phrase structure is opposed to theirs in other ways. I have no proposal for the relationship between Ref[0] and CP-related functional structure.

[17]Szabolcsi (1994) has Det dominating Num; Zamparelli (2000) has a Strong Determiner Phrase dominating a Predicative Determiner Phrase; Laenzlinger (2000) advocates an "inward-looking" and an "outward-looking" DP, paralleling Rizzi's (1997) FinP and ForceP respectively; and Borer (2001) has DP dominating #P, for example. On the other hand, Longobardi (1994) proposes a simpler syntax–semantics mapping, with only Det and N heads. See Zamparelli (2000) on incompatibilities between this approach and a type-shifting view of nominal semantics (following Partee 1987).

duced, may be dominated within the DP by up to three variables ($<e>_d$, $<e>_\#$ and $<e>_{DIV}$), syntactically heads, which can be bound, for instance by Spec-head agreement with an appropriate XP, by merger of a free functional morpheme in the head position, or, in the case of the higher variables, externally to the DP. These three variables have roughly the following functions: the range assigned to $<e>_{DIV}$ (e.g. by plural markers or classifiers) 'divid[es] mass' (Borer 2001, ch.3, p.14); the range assigned to $<e>_\#$ (e.g. by cardinals, quantifiers, 'a', etc.) 'assigns specific quantity to...mass divisions [such as those] created by the plural marker' (Borer 2001, ch.3, p.21) and the range assigned to $<e>_d$ (e.g. by determiners, quantifiers, or existential closure) determines 'the mapping of predicates onto objects and/or quantifiers' (Borer 2001, ch.2, p.7). In other words, bare lexical entries used as nouns have most of their properties in common with mass nouns, and more complex types of DP (plurals, phrases with classifiers, phrases with determiners, etc.) result directly from the functional structure in which these lexical items are embedded. Merging one of these functional heads could then be seen as adding a unary feature to the nominal semantics. So merging $<e>_{DIV}$ essentially adds the feature [count] to the noun, while the value of this [count] feature is determined by the range assigned to $<e>_{DIV}$.

I adopt Borer's proposals here in essence. For greater terminological clarity, I will rename $<e>_{DIV}$ as Div^0. As $<e>_d$ and $<e>_\#$ are more or less equivalent to the Determiner system, plus specification for singular or plural number, I adopt the more familiar terminology Det and Num. The overall DP-internal functional structure which I propose is then as follows:

(39)

Det

    Num

       Ref

          Div

             Same $\sqrt{\text{root}}$
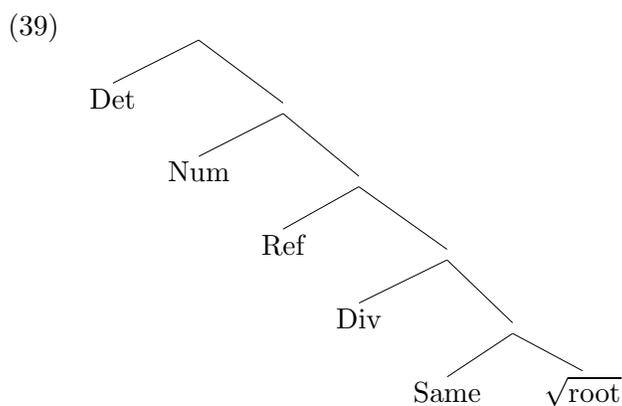
Note that Same^0 and Ref^0 cannot correspond regularly to any of Borer's functional positions, as, in her proposal, the minimal nominal functional structure (a

determinerless mass noun) has only $<e>_d$ and the NP layer. I argued in the section 2.4 that the referential index cannot be associated with the lexical layer, while a fundamental motivation behind Baker's postulation of the referential index was to move away from the traditional view that sub-determiner noun phrases denote properties, which can only be made to refer through the DP layer. If $Same^0$ is distinct from N and D, then, and if there are no other functional positions in determinerless mass nouns in Borer's proposed structure, and if $Same^0$ is indeed the defining feature of a noun phrase, then the syntactic locus of this standard of sameness must be independent of all of Borer's functional structure.

This doesn't directly force Ref^0 to be independent of all of Borer's functional structure, and it may appear tempting to integrate this notion into the determiner system, in some way. I keep it separate for two reasons, firstly, because it is instrumental in deriving the adjectival focus position to be discussed in section 3.2, and secondly because it provides an equivalent of sorts to the KIP of Zamparelli (2000).

In Zamparelli (2000), the KIP layer is the level which corresponds to the standard notion of "common nouns"[18], and which is instrumental in explaining a very wide range of phenomena, from pivotal constructions such as 'Cars of this kind' — 'This kind of car', through Italian pronominal 'ne', to the structure of Carlsonian Kinds and bare plurals. Adjectives are only briefly mentioned in his account, but it is assumed generally that 'Adjectives that appear between a noun and its complement are attached at the lowest possible position, that is, within KIP' (Zamparelli 2000, p.10). The combination of the requirement for a KIP layer below the determiner system (Zamparelli 2000), the arguments that referentiality isn't simply due to the determiner system (Baker 2003), and the splitting of the referential index into two heads, make Ref^0, independent of the other functional heads above, an attractive proposition.

2.5.1 Representation of the functional structure

As far as possible, I will ignore the determiner layer (i.e. Det and Num) in this paper, as it is worthy of, and receives, detailed scrutiny quite apart from the issues I hope to address here. It is worthwhile, however, to clarify exactly how I will represent the

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[18]This recalls the suggestion in a footnote in Baker (2003) that we treat Adj–N groups as 'internally complex common nouns' — which, in turn, recalls Carlson's (1977) proposal that common nouns were the names of kinds of things. I have nothing against these ideas in principle, in which case much of the point of this thesis is to flesh out exactly what is meant by this notion, and what the structure of this 'internal complexity' is.

workings of the four lower layers, starting at the bottom.

Following Marantz (1997, 2001), I take it that the lexical root in any extended projection is a category-neutral morpheme, whose phonetic form and combinatorial possibilities are largely determined by the functional structure in which it is embedded. For simplicity, however, I will represent this level in tree diagrams as a single word.

After $Same^0$ has merged, I take it that an index, a standard of sameness, is assigned to the root, nominalising it. I will represent this, and other indices, by subscript letters, e.g. 'Car_i'.

Following this is Div^0. Borer conceives of the function of this head in terms of:

> 'The superimposition, on a mass denotation, of an infinite set of webs, or reticules (including, potentially, a reticule without any divisions, reticules without complete cells, or reticules which create cells that do not correspond to a canonical singular)' (Borer 2001, ch.3, p.32).

For a sentence to be interpreted, it will presumably be necessary to select an appropriate member of the set of reticules, which will usually be the reticule corresponding to the divisions taken to be the 'canonical singular'. Values of Num^0 and contextual information may force it to be otherwise, however. How the member of this set is selected is a topic which is too far removed from adjectives to address at all here (I refer the reader to Borer 2001 for discussion). For concreteness, however, I represent the effect of Div^0 on its sister with another subscript letter, r, representing a member of the set of reticules.

Finally, Ref^0 adds a second index, representing the referent-tracking function of Baker's referential index. This means that, overall, I will represent the sub-determiner structure of a count DP[19] as follows:

(40) $chicken_{i,r,m}$

    Ref^0 $chicken_{i,r}$

           Div^0 $chicken_i$

                 $Same^0$ chicken
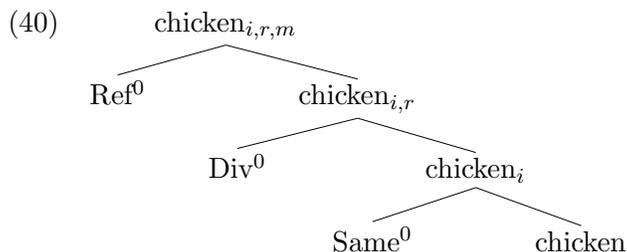
Of course, much of this structure will often be irrelevant to the issue at hand in the rest of this thesis, so much of it will often be omitted in trees and examples. It should be presumed that it is tacitly there, however.

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[19]A mass DP will be identical, but lacking Div^0 and its index.

The following two chapters are devoted to spelling out some fundamental considerations about attributive adjective modification, and then demonstrating some different types of adjective structure in English and French. I hope to show, in the following chapter, that it is *not* possible for the nominal functional structure adopted here, or any simple linear modification of it, to motivate the major adjective ordering restrictions observed in section 2.1.

Chapter 3
English adjective orders

3.1 Merging attributive adjectives within DP

Let's start at the beginning. An essential property of language is that it is a productive system for combining meaningful units into larger meaningful units, and the meaning of these larger meaningful units is generally predictable on the basis of the smaller units. This is much of what makes language such an efficient way of saying all sorts of things about all sorts of things.

Next, let's assume that the restriction to binary branching is well justified. This means that, at any one time, we are only combining two smaller meaningful units into one larger unit. There are several architectural reasons why this restriction is a useful one. Some concern the ease of determining the roles of these constituents relative to each other (as shown in the Linear Correspondence Axiom of Kayne 1994, for example), but the more immediately important ones involve the ease of implementation of a semantic model based on lambda calculus within generative syntax.

Within such a model, a functor combines with a dependent of an appropriate type, and a free variable in the head is bound by the value of the dependent. The workings of this are clearest with verbs and their arguments, so I will briefly divert my attention away from the DP to consider the clausal workings of the calculus. Abstracting away from 90% of clausal functional structure, we can represent the semantics of an intransitive verb like 'snore' as in (41):

(41) 'snore': $\lambda x.\text{snore}(x)$

The semantics of this simplified representation of an intransitive verb is, then, a function from entities to truth values: depending on what entity binds the variable x, and whether or not it is a snoring entity, the proposition will be either true or false.

Of course, not only intransitive verbs can be represented as functions from entities to truth values: so can nouns and adjectives. So, depending on whether or not x is bound by a 'car' in (42), the proposition (roughly that 'x is a car') will be either true or false, and the same in (43) depending on whether or not x is bound by a red thing:

(42) 'car': $\lambda x.\text{car}(x)$

(43) 'red': $\lambda x.\text{red}(x)$

This view of nominal and adjectival semantics suggests, counter-intuitively, that a primary feature of nouns and adjectives is forming propositions on the basis of them. The semantics above seems most intuitively linked to copular constructions: we could imagine, on the basis of (43), a representation of 'Charles is red' as in (44), for example.

(44) $\lambda x.\text{red}(x)[\text{Charles}]$
     $\equiv \text{red}(\text{Charles})$

However, we more frequently encounter nouns in DPs, as arguments to propositions formed around verbs, and adjectives are used attributively probably just as often as they are used predicatively. In these cases, with nouns and adjectives embedded within DP structure, clearly much more needs to be said, rather than broadly labelling all three categories as type $\langle e,t \rangle$.

Firstly, though, let's return to the verbs. Taking a regular transitive verb like 'kick', it is clear that this verb takes two arguments, the kicker and the kicked. It is also clear that, regardless of the values assigned to these two arguments, we are still dealing primarily with an event of kicking (albeit one which has one less free argument slot as a result of combining with a DP) and most proposals concerning clausal (in other words, DP-external) functional structure concern only functional heads specifying event-related parameters (tense and aspectual values, for example)[20]. We could, then, give a vastly simplified bare phrase structure-style syntax and lambda-based semantics for transitive 'kick' as in (45):

(45) a.
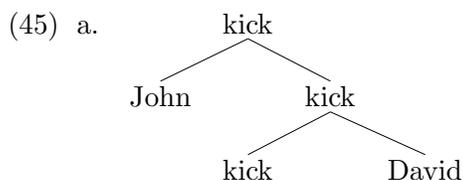
   b. $\lambda y \lambda x.\text{kick}(x, y)[\text{David}]$
       $\equiv \lambda x.\text{kick}(x, \text{David}).$
       $\lambda x.\text{kick}(x, \text{David})[\text{John}]$
       $\equiv \text{kick}(\text{John}, \text{David}).$

Here, the syntactic and semantic headedness clearly coincide. The arguments are binding free variables in the functor verb, and the resulting object is first and foremost an event of kicking.

---

[20]AgrP, a clear exception to this, is frequently invoked, for example in Cinque (1999), Koster (1999) and Brody (2000), despite the doubts expressed about its validity in Chomsky (1995), on the grounds that it is semantically empty. The issue of the status of AgrP is discussed further in the appendix.

There is another type of combination available within the VP. While the two arguments in (45) are generally essential, there are also adjuncts, such as adverbs or many PPs, which can be merged within the clause, and which have many more characteristics in common with adjectives. We therefore find sentences like the following:

(46) a. 'John gleefully kicked David.'

     b. 'John gleefully kicked David in the shins.'

     c. 'John gleefully kicked David in the shins in his garden.'

     d. 'John gleefully kicked David in the shins in his garden in the afternoon.'

Such elements clearly have a lot in common, syntactically and semantically, with attributive adjectives: they too are at least optional (section 1.2.1) and recursive (section 1.2.2), and may share the other properties listed in section 1.2 too. In these cases, the semantics of either of these classes of elements cannot be related to the syntax in the same way as with arguments, as we can happily have no adjuncts in a given phrase, but we conceivably also have four or six, as in (46) or (47). The same is transparently not true of arguments in verb phrases, as (48) shows:

(47) a. 'my roller skates'

     b. 'my first speedy little pointed red Italian roller skates'

(48) a. 'John snores'

     b. * 'John Paul George Ringo Pete Stuart snore(s)'

A desirable theory of adjuncts would then be one which motivates the distinction between these optional elements, and the syntax and semantics of more core elements such as verbal structure and arguments. A first approximation to the syntax of an Adv–V group, as in (49), or an Adj–N group, as in (50), looks similar to that of the verb in (45) above, in that something merges with the noun or verb, but it retains more or less the same label:

(49)

(50)

```
        car
       /    \
     red     car
```
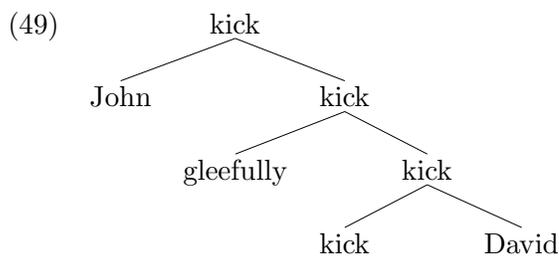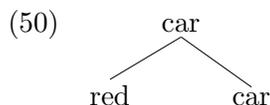
Regardless of any superficial structural similarities, however, it is clear that the details of the combination are quite different. Concentrating once more on attributive adjectives[21], their recursion and optionality demonstrate that they are clearly not binding free variables that are obligatorily present within the nominal semantics, in the same way that arguments are within the verbal semantics. Yet there is clearly some form of semantic combination going on. If we have ruled out the Cinquean view of adjectives as specifiers of rigidly ordered and distinct heads (section 2.2), and also any model based on set intersection (in section 2.3), then two remaining possibilities are either that the noun (and any adjuncts already merged lower down) is an argument of the adjective being merged, or that the argument structure of the nominal can somehow be expanded to provide a slot for an adjective. These approaches are roughly the semantic equivalents, respectively, of analyses with the adjective as a head taking an NP complement[22], and NP-shell analyses. Both of these analyses have many adherents within the literature. I will expand a little on how these approaches would proceed.

At this point, we should address the issue of the semantic type of adjectives. There are two main contenders: firstly, the evidence from copular and predicative constructions suggests that adjectives denote properties, of type $\langle e,t \rangle$: as Partee (1987) and Zamparelli (2000) show, they alternate with indefinite DPs, and can be co-ordinated with them, in copular constructions, for example:

(51) 'I consider the professor [[$_{Adj}$ intelligent], and [$_{DP}$ an authority in his field]].'

On the other hand, the evidence from attributive uses suggests that adjectives are functors, taking nominal properties as arguments. If an $\langle e,t \rangle$ element (the nominal) is going to function as an argument, then the functor must be of type $\langle \langle e,t \rangle, x \rangle$. A reasonable assumption, found in Montague-style grammars, is that x is also equal to $\langle e,t \rangle$. This makes sense as an Adj–N group has very much the same syntactic distribution as a noun alone, so if the output type is the same as that of a bare noun, we have largely explained the optionality (section 1.2.1) and recursion (section

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[21]Although similar arguments could be made for any of the other classes of adjunct mentioned above.

[22]Or perhaps an adjunction analysis, in the traditional sense.

1.2.2) of attributive adjective merger. This is the standard position in works in the Categorial Grammar tradition (see e.g. Lewis 1972 and Kamp 1975): adjectives are of type $\langle\langle e,t\rangle,\langle e,t\rangle\rangle$.

In either case, something must be said concerning the adjective's ability to fulfil the other function. For Kamp (1975), the use of adjectives in contexts where they don't modify an $\langle e,t\rangle$ element is explained by recourse to an implicit hyperonym: 'John is big' is roughly equivalent to something such as 'John is a big person / thing'. On the other hand, under the analysis of the fundamental type of adjectives as properties, the formation of Adj–N groups relies on the availability of an operator of type $\langle\langle e,t\rangle,\langle\langle e,t\rangle,\langle e,t\rangle\rangle\rangle$, that is, an operator which will take a property as its argument and output a higher-order function from properties to properties.

Although either explanation is feasible, I will assume that the basic type of adjectives is $\langle e,t\rangle$, and there is an operator which permits attributive modification, following e.g. Partee (1987)[23]. This is for two reasons: firstly, the details concerning the hyperonym in Kamp's analysis are too sketchy, and raise questions about the null elements which must be assumed. Secondly, assuming that adjectives are of type $\langle e,t\rangle$ in predicative constructions, but can be type-shifted to $\langle\langle e,t\rangle,\langle e,t\rangle\rangle$ permits explanation of several facts concerning the distribution of adjectives. For example, it allows us to suggest a semantic reformulation of the distinction in Bernstein (1993) and Alexiadou (2001) between a class of adjectives that are X^0s and a class that are XPs: in Bernstein's analysis, the A^0s are distinguished by never occurring in predicative constructions and by not taking modifiers such as 'very', for example:

(52) a. 'That car is big'

    b. 'A very big car'

    c. * 'That car is former'

    d. * 'A very former car'

Such facts permit a more structurally uniform explanation if we assume that, in fact, those adjectives which Bernstein labels as A^0s are in fact of basic type $\langle\langle e,t\rangle,\langle e,t\rangle\rangle$, while those that she labels as APs are in fact of type $\langle e,t\rangle$ and require a type-shifting operator to be used attributively. If, furthermore, degree modifiers take $\langle e,t\rangle$ arguments (which seems reasonable, as there is nothing wrong about a sentence

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[23]Although adjectives are not the focus of Partee's paper, she does comment that $\langle e,t\rangle$ adjectives can be converted to $\langle\langle e,t\rangle,\langle e,t\rangle\rangle$ by 'standard techniques' (Partee 1987, p.370).

such as 'That car is [very big]'), we have largely derived the restrictions on adjective distribution in (52).

The question then becomes one of the order in which this type-shifting operator selects its arguments: either it could select an adjective, outputting a function from nominals to nominals[24] (which would look syntactically like (53)), or it could select a nominal, outputting a function from adjectives to nominals, as in (54):

(53)

(54)
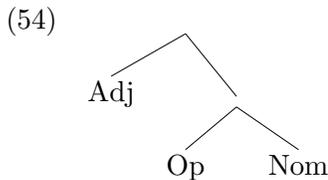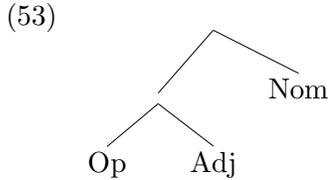
Ortmann (2003) claims to have found cross-linguistic evidence for the overt realisation of both of these possible operators, within a different theoretical framework, Lexical Decomposition Grammar[25]. It is not clear to me, however, that there is any difference between what is possible in the two options, given standard considerations, and so the only basis I can see for choosing between the two options is a theoretical one.

As an approximation of the content of these operators, I propose a formulation in the spirit of the JOIN operator, originally proposed in Chierchia and Turner (1988) and modified in Baker (2003), but further modified to avoid set intersection and permit representation of scope:

(55) Baker's JOIN:
   '$\lambda x^{\cup}(X' \cap Y')(x) = \lambda x \exists y [^{\cup}X'(y) \&^{\cup}Y'(x) \& \text{same}(Y)(x,y)]$' (Baker 2003, p.204)

(56) a. My JOIN, option 1: merging with adjective first:
   $\text{JOIN}(\lambda x.A(x)) = \lambda N \lambda x.(A(N_i(x)))_j$

   b. My JOIN, option 2: merging with nominal first:
   $\text{JOIN}(\lambda x.N_i(x)) = \lambda A \lambda x.(A(N_i(x)))_j$

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[24]By "nominal", I mean the noun, plus any adjuncts which may already have merged.

[25]The details of this framework are not spelt out in Ortmann's paper, but it appears that the history of a derivation is more transparently represented in the result of that derivation than is often taken to be the case.

Where:

A is the property denoted by the adjective;

N is the property denoted by the noun (or Adj–N group);

$A(N(x))=1$ iff $x \in$ the set constructed on the basis of N, determined by the property of A relativised to N;

i is the index assigned by Same^0 to NP (or the index assigned as result of merging an earlier adjective);

j is the index assigned by Same^0, but updated to reflect the updating of the property denoted by N through the merger of A.

Most of this is merely a formulation of what has gone before in this section and in section 2.3. I have not yet, however, said anything concerning the indices i and j. These representations of the standard of sameness are necessary to restrict attributive adjective modification to noun phrases, the only bearers of this standard. In Baker's version, this is achieved by the conjunct 'same$(Y)(x,y)$'. In a representation which had no mention of the standard of sameness, examples like (57), which are clearly ungrammatical, would be allowed:

(57) * 'The car was big red.'[26]

The requirement of a standard of sameness entails that adjectives may only be merged above Same^0, or rather that any adjectives merged lower in the tree should have the qualities of lexical compounding (idiosyncratic meanings, perhaps some degree of category-neutrality), rather than regular syntactic composition of adjective and noun.

The syntax and semantics of attributive adjectival modification under these proposals will be along the lines of one of the following:

(58) a. Option 1: merging with adjective first
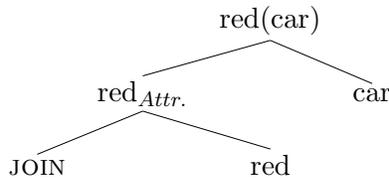
b. 'red'$=\lambda x.\text{red}(x)$
'car'$=\lambda x.\text{car}_i(x)$
JOIN$(\lambda x.\text{red}(x)) = \lambda P\lambda y.\text{red}(P_i(y))_j$
$\lambda P\lambda y.\text{red}(P_i(y))_j[\lambda x.\text{car}_i(x)] = \lambda y.\text{red}(\lambda x.\text{car}_i(x)[y])_j = \lambda y.\text{red}(\text{car}_i(y))_j$

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[26]If JOIN did not require a standard of sameness, this could be derived by applying JOIN to one $\langle$e,t$\rangle$ adjective, providing a slot to merge the second. We must clearly rule out such derivations.

(59) a. Option 2: merging with nominal first

$$\text{red(car)}$$

```
        red(car)
       /        \
     red       x(car)
              /      \
           JOIN      car
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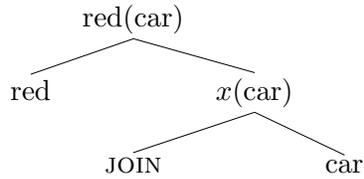
b. 'red'$=\lambda x.\text{red}(x)$
'car'$=\lambda x.\text{car}(x)$
JOIN$(\lambda x.\text{car}_i(x)) = \lambda A\lambda y.(A(\text{car}_i(y)))_j$
?? $\lambda A\lambda y.(A(\text{car}_i(y)))_j[\lambda x.\text{red}(x)] = \lambda y.(\lambda x.\text{red}(x)(\text{car}_i(y)))_j$
$= \lambda y.(\text{red}(\text{car}_i(y)))_j$

Given these two approximations of the syntax and semantics of the attributive adjective construction, it is clear that Option 1, in (58), is preferable. For Option 2, in (59), to work, we either have to move away from standard functional application within the lambda calculus, or we have to assume that the isomorphism between syntax and semantics is lost: we could claim, for example, that there is a productive lexical rule whereby adjectives come in two "flavours", an $\langle$e,t$\rangle$ flavour and an $\langle\langle$e,t$\rangle, \langle$e,t$\rangle\rangle$ flavour, and that it is the latter which is selected here. This is so close to Option 1, however, that we may as well just adopt Option 1. The representation in (58) will therefore be the representation I adopt for an attributive adjective[27,28].

This formulation of JOIN is very different from that in Baker (2003). Set intersection in Baker (2003) is replaced by functor–dependent relationships here. This is not, however, without precedent. Compare the definition of dynamic conjunction in Chierchia (1995) as 'A$\underline{\triangle}$B $= \lambda$p[A($^\wedge$B(p))]' (Chierchia 1995, p.87). There is a clear, and non-accidental, formal similarity between the two proposals. If we subscribe to the notion of a dynamic semantics formulated in terms of Context Change Potential then conjunction can be represented in terms of reducing the context c to a set c' of those worlds in c which are compatible with the new information in one conjunct, then reducing this new context c' to the set of worlds compatible with the information in the next conjunct, and so on. Although Chierchia (1995) (as well as other classic pieces of Context Change Potential literature such as Heim 1992) concentrate on units of discourse larger than the DP, the same argument must also hold true at

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[27]I am giving a syntactic reality to JOIN for concreteness. Whether or not this is the correct treatment of such covert type-shifting operators is very much an issue orthogonal to the point of this thesis.

[28]Peter Svenonius (p.c.) points out that the fact that attributive adjectives agree with nouns more regularly than predicative adjectives, but that nouns rarely (if ever) agree with attributive adjectives, could be taken as further morphosyntactic evidence that there is extra syntactic structure in attributive adjectives, and that this is attached to the adjective, rather than the noun.

this smaller level, as within the DP, we are dynamically building referents that are just as much part of the context as the propositions formed from them in the clause.

This representation captures the essential facts about attributive adjectives detailed above: the modification is potentially recursive (section 1.2.2) because the type of the noun is unchanged by merging an adjective; the modification is optional (section 1.2.1) because what is usually essential for a DP is that it provides an argument to the clause which contains it, and this is entirely unhindered because there is nothing in the nominal semantics which requires the merging of an adjective (the requirement coming instead from the semantics of JOIN, which requires an $\langle e,t \rangle$ element to modify); JOIN can only take nominals as complements, because only these nominals have a standard of sameness; and scope is represented (section 1.2.5) because the most recently merged adjective directly modifies the group consisting of the noun and any adjectives merged earlier, and this group is basically semantically opaque (i.e. an Adj-N group behaves exactly like a lone noun as far as any further syntax and compositional semantics is concerned)[29].

As for a syntactic representation of attributive adjectives in terms of the standard notions of specifiers, heads and complements, I will follow Abney (1987) in assuming that pre-nominal English adjectives are uniformly heads, selecting nominal complements. This is an attractive proposal as it generalises a representation often proposed for small classes of adjectives (modal adjectives in Higginbotham 2003, A^0s in Bernstein 1993) to the class of regular attributive adjectives as a whole, and in doing so, assimilates adjective–noun orders in this construction to head–complement orders, at least underlyingly, and suggests (again following Abney 1987) a solution to problems such as the restriction on adjectives with PP complements to post-nominal position[30].

If a pre-nominal adjective is in a head–complement relationship with its sister, then there is no space for a PP complement, but such complements are available with post-nominal adjectives:

(60)   a. * 'A [[$_{AP}$blinded [$_{PP}$by the headlights]] cyclist]'

     b. 'A cyclist [$_{AP}$blinded [$_{PP}$by the headlights]]'

Of course, the analysis of attributive adjectives as heads taking nominal comple-

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[29]Having said that, I will ignore JOIN in most of what follows because it makes no odds syntactically and simplifies the trees somewhat.

[30]There are many languages which have typically pre-nominal adjectives, but allow [Complement Adj] N order. I have no suggestion for how to accommodate such a structure.

ments raises many problems. Some concern the disruption by intervening AdjPs of the complement-selection process, or what we would perhaps now call the FSEQ, in the DP. So if an unlimited quantity of Adj heads can intervene between D and N, D must be able to select either Adj or N as its complement, as must Adj. I believe this could be relatively straightforwardly dealt with in terms of a notion such as the Extended Projections of Grimshaw (2003). A rather more serious problem concerns the fact that degree modifiers such as 'very' are quite regular with attributive adjectives, and such complex word-level internal structure is not normally associated with heads. I will sketch a treatment of these issues in terms of the function of the different elements in the appendix, but here, I will assume that such difficulties are surmountable and that a treatment of attributive adjectives as heads is workable. In the following section, I will describe a second possibility for adjective merger within the DP.

3.2   There is a DP-internal Focus position

The majority of cases of multiple attributive adjectives occur in the standard orders, such as those in (61) below. We must acknowledge, however, that the opposite order is also possible, with particular intonation, as in (62):

(61) a. 'A big red car'

   b. '10,000 apparent red rice seeds'

(62) a. 'A RED big car'

   b. 'At the horizon, the blue apparent sun is highest and the red apparent sun is the lowest' (from 'Scientific American, Ask the experts')

My claim is that these alternative orders in (62) are only possible within a focus–presupposition structure[31], in the sense of Rizzi (1997), where:

> 'The preposed element, bearing focal stress, introduces new information, whereas the open sentence expresses contextually given information, knowledge that the speaker presupposes to be shared with the hearer' (Rizzi 1997, p.285).

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[31]Adjectival focus may well be possible without the adjective appearing overtly in any focalisation position, being interpretable instead on the basis of distinct "focus" intonation alone. I believe that this could be accommodated straightforwardly within the account to follow, as all that is really necessary for this account to be feasible is for there to be some recognisable perceptive cue that a focus interpretation is intended. Discussing the focus-in-situ option would take me further into intonation than I want to go, though, so I concentrate on the overt syntactic focus position here.

Rizzi, of course, is concerned only with the structure of CP, and so his description is only partially relevant to the DP. The focus–presupposition structure in the DP has similarities in the new–old order, but is clearly different in that what is "new" and "old" is not any propositional or predicative structure, but rather referents and kinds.

Starting with the similarities, note that the DPs in (62) above are not felicitous in isolation. (62b) occurred in the context of an explanation of the difference between the 'apparent' sun, as we see it, and the 'actual' sun as it really is, and of refraction of light. At the point in the text where the above sentence is used, 'apparent sun' is a salient noun phrase in the text, but one which has not been modified previously by any colour adjective.

As for (62a), it is clear that (63) in isolation is infelicitous. This is because there is no earlier discourse in which 'big car' is given, and so the "presupposition" part of the focus–presupposition structure cannot be satisfied. Embed this sentence in an appropriate larger discourse, as in (64), however, and the problem disappears:

(63) # 'I drive a RED big car.'

(64) 'Lots of people drive big cars nowadays, but I drive a RED big car.'

Roberts (1998) builds a description of focus on the notion that both questions and answers (assertions) have sets of alternatives, the 'Q-alternatives' of questions and the focal alternatives of assertions. I give Roberts' definitions of these notions below:

> **'The Q-alternatives corresponding to the utterance of a clause α:**
> **Q-alt(α),** $= \{p : \exists u^{i-1}, \dots, u^{i-n} \in D[p = |\beta| (u^{i-1}) \dots (u^{i-n})]\}$, where α has the logical form $wh_{i-1}, \dots, wh_{i-n}(\beta)$ with $\{wh_{i-1}, \dots, wh_{i-n}\}$ the (possibly empty) set of *wh*-elements in α, and
> D is the domain of the model for the language, suitably sortally restricted (e.g. to humans for *who*, non-humans for *what*)' (Roberts 1998, p.7).

> 'The focus alternative set corresponding to a constituent β, $\| \beta \|$, is the set of all interpretations obtained by replacing all the F-marked (focused) and *wh*-constituents in β with variables, and then interpreting the result relative to each member of the set of all assignment functions which vary at most in the values they assign to those variables' (Roberts 1998, p.25).

β is defined as **congruent** to α if $\| \beta \| = $ Q-alt(α), which leads to the following claim concerning the presupposition of a focus construction:

Presupposition of prosodic focus in an utterance *β[32]:
β is congruent to the question under discussion at the time of utterance
(Roberts 1998, p.25).

Clausal focus, then, asserts an answer selected from a set congruent to the set of all possible answers to the question under discussion. The possibility of going against the usual adjective order within the DP suggests a DP-internal focus position, which should also be relatively straightforwardly accommodated within this model. Replacing the focused adjective with a variable in (64) above gives the following:

(65) 'Lots of people drive big cars nowadays, but I drive [a x big car].'

(66) 'What kind of big car?'

This suggests that the question under discussion to which (65) is congruent must be as in (66)[33]. DP-internal adjectival focus seems, then, to be a question of fixing a value for a variable ranging over subkinds of a kind already present in the discourse context.

As for a syntactic representation of this information structure, recall my earlier suggestion of assimilating Ref^0, after which nominal properties are no longer dynamically updated, to Zamparelli's KIP, a level at which the properties formed from nouns and non-focused adjectives are fixed as a kind. The requirement, from Rizzi (1997) or Roberts (1998), that the presupposed element be already present in the discourse necessitates, for referent tracking, that Ref^0 be present at this level in the noun phrase, yet, seeing as we are dealing with similarity of *kinds* (big cars, apparent suns), rather than individual entities, it is appropriate to envisage KIP and RefP as the same level.

Focalised adjectives must, then, be above Ref^0. I assume, following Cinque (2003) and Gutiérrez-Rexach and Mallen (2002), as well as Rizzi's original proposal for clausal focus, that adjectives are moved to this position, to enter into a feature-checking configuration with the Foc^0 head. This reflects the intuition that cases of adjectival focus and the corresponding focus-free noun phrases are capable of referring to the same elements, and the difference between the two positions is related only to the discourse function of the focus operator.

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[32]where * is a mood variable ranging over interrogative, assertive,...

[33]Note that (66) is a wh-DP, rather than a full wh-sentence. I take this to be appropriate for DP-internal focus. Of course, a lone wh-DP does seem to be presupposing that it is part of an implied wh-sentence, but the DP with focalised adjectives would never occur absolutely in isolation either.

I also assume, for now, that focalised adjectives occur below the bipartite determiner system which many modern syntactic analyses of DP structure assume, as noted in fn.17 above. Of course, if we wanted to play the game of maximising similarities between the DP and the clause, we should presume that the focus position is located between the two parts of the determiner, just as Rizzi (1997) located FocP between ForceP and FinP. I do not follow this possibility here, as Borer (2001) and Zamparelli (2000) propose structures for non-specific indefinites in which the indefinite article remains in the lower of the two determiner positions, and yet we do not find any pre-determiner focalised adjectives in this case[34]. Assuming, with Rizzi (1997), Spec-head agreement between the focused adjective and a Foc head, a simplified structure of a DP with focused adjective will then be as follows:

(67)
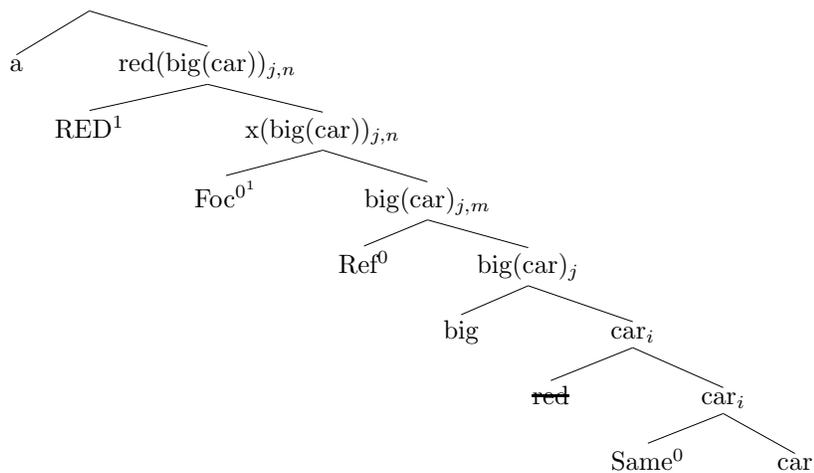
Superscript indices represent Spec-head agreement,
i and j represent dynamically updated standards of sameness, and
m and n represent dynamically updated kinds.

In English and French, proposing that focused adjectives are specifiers counts for little in terms of word order, as this will predict that they are linearised to the left of their sister, the same as if they are heads. It would, however, make a significant prediction in the case of head-final languages, where adjectives should be regularly post-nominal, but focused adjectives could be pre-nominal. This prediction remains to be verified.

If Ref^0 is the head which closes off any possible modification of the nominal property, then these higher, focalised adjectives cannot be straightforwardly updating

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[34]English is probably not the best language on the basis of which to determine this position, however, as we do not find pre-determiner *anything* in the DP. It would be interesting to see how the facts from Hungarian, for example, fit in, as Szabolcsi (1994) reports the possibility in that language of DP-internal constituents moving to pre-determiner position in certain cases.

this property in the same way as lower adjectives. I propose, instead, that they dynamically update the kind denoted by the (Adj–)N complex with which Ref^0 has merged. There may be some evidence for this. Note that when an entity is brought into the discourse by picking out that entity from the set of entities denoted by a particular kind, that kind can be referred to anaphorically by a plural pronoun. This pattern is illustrated in (68):

(68) 'I've got [a [labrador$_i$]]$_{[sg]}$. They$_{i[pl]}$'re wonderful, they're just so nondescript and doggy.'

In this light, consider the following utterance:

(69) 'All my friends drive [big cars]$_i$, but only very few of us drive a [JET BLACK [big car]$_i$]$_j$. I love them$_j$, they strike fear into the hearts of all that see them.'

To the extent that this is an acceptable string of sentences (and it sounds fine to me), there must be two kinds present in the DP 'a JET BLACK big car', as [big car] is presupposed as a kind by the focus–presupposition structure, and [JET BLACK big car] serves as an antecedent for anaphoric 'them'.

Adjectives merged between Same^0 and Ref^0, then, dynamically update the first part of the referential index (as assigned by Same^0), and adjectives merged above Ref^0 dynamically update the second part of this index. In keeping with the proposal given above from Roberts (1998) for the set of focal alternatives in a given sentence, it therefore seems appropriate to conceive of the function of Foc^0 as adding a variable ranging over possible subkinds of the kind fixed by Ref^0. I give a definition of KSK, the operator constructing subkinds from kinds in Zamparelli (2000), below[35]:

(71) **KSK**$(\|$ **KIP** $\| ^{M,g,w}) = \lambda x^k \forall z \Box [\mathbf{R}(z,x) \rightarrow \mathbf{R}(z, \| KIP \| ^{M,g,w})]$ (Zamparelli 2000, p.175), where:
$\| KIP \|$ is the denotation of KIP (equivalent to my RefP);
R is the 'realisation relation' through which stages realise individuals (objects or kinds).[36]

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[35]Zamparelli claims his operator is part of the meaning of his PD (largely equivalent to my Num^0), in order to capture the semantics of examples like the following:

(70) 'Nowadays, every computer is sold in at least two models' (Zamparelli 2000, p.175).

In this example, the preferred reading is one where the quantifier ranges over subkinds of 'computer', rather than objects instantiating 'computer'. If this is accurate, it may constitute evidence for a higher position for focalised adjectives, within the determiner layer, as discussed earlier. I leave the matter open for future cross-linguistic research.

[36]Adopting Zamparelli's KSK operator for the semantics of Foc^0 makes the prediction that modal adjectives are unavailable in focus position, as they would not fulfil the requirement that an entity realising a subkind also realises the super-kind. This seems *a priori* plausible to me, although I have no evidence to support this claim. I will briefly return to the matter in section 4.4.2.

Such a semantic representation is identical to that which Roberts' description of focus semantics would lead us to expect for Foc^0, and range would then be assigned to the variable x through Spec-head agreement with the focalised adjective.

The proposed focalisation mechanism within the DP is, then, one whereby Foc^0 operates on the kind denoted by its sister to give a variable ranging over potential subkinds of that kind, and attracts an adjective to its specifier position to give a feature-checking configuration. I turn in the following section to a more complete examination of the ordering restrictions affecting these two types of adjectival modification.

3.3 Regular adjectives dynamically modify the standard of sameness

Given the nominal functional sequence proposed in (39), and a view of regular attributive adjectives as heads (following section 3.1), there are multiple conceivable possible positions for adjectives to merge. In principle, adjectives could merge in any of the following positions:

(72)
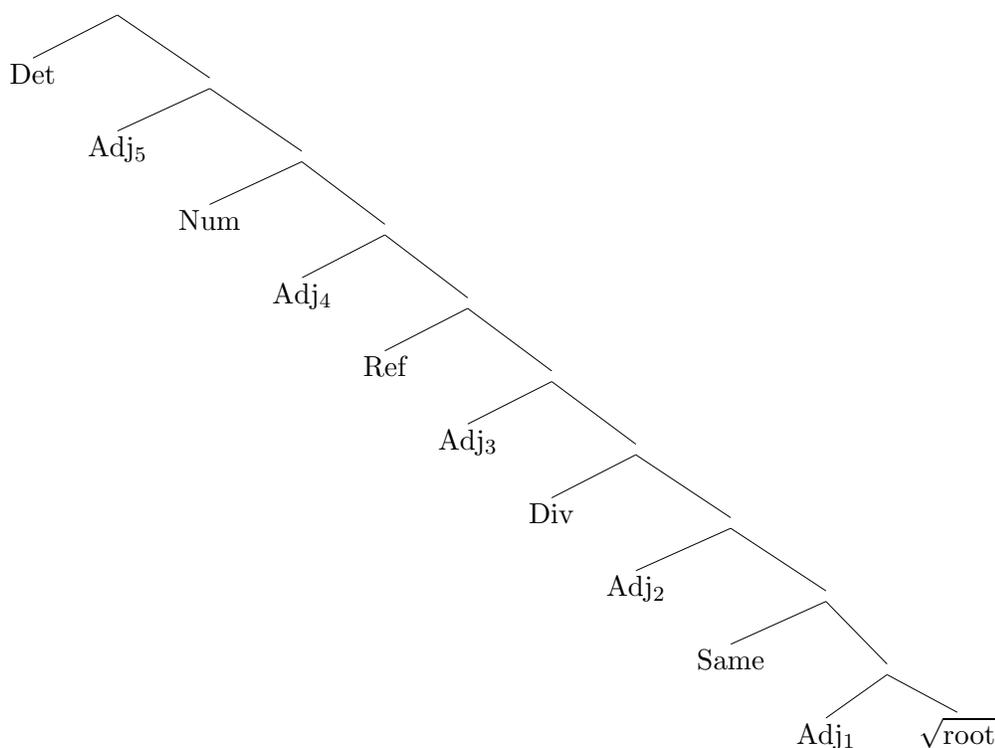
It appears that adjectives may, in fact, be merged in any of the positions except the highest, Adj_5 (i.e. they can be merged in any of the positions below Num^0).

The adjective will, however, be differently interpreted according to the position in which it is merged. The next highest position, Adj_4, is the locus of adjectives with focus–presupposition semantics, under the proposal in section 3.2 above. On the other hand, the lowest of the positions in the tree, Adj_1, is below the nominalising Same^0, and so is distinct from higher adjectival modification, under the proposals in Marantz (2001), in that merger in the sub-n(=Same^0) position gives apparently idiosyncratic meaning and 'apparent semi-productivity' (Marantz 2001, p.14), rather than predictable and productive higher merger.

It seems, then, that regular English attributive adjectives are merged somewhere above Same^0, but below Ref^0 (i.e. in the positions labelled Adj_2 and Adj_3 in (72)). Such adjectival modification essentially amounts to dynamically updating the property denoted by the noun phrase. In keeping with the adjectival semantics proposed in section 3.1 above, merging an adjective in this way is productive, operating on the sister argument of the adjective to create a new property relative to the property denoted by that argument. The question in this section is, to what extent is this independently motivated functional structure capable of accounting for the constraints on adjective orders noted in section 1.2 above, and to what extent must other factors be invoked?

3.3.1   Relative orders of modal and non-modal adjectives

As noted in section 2.3, the way in which modal adjectives modify the property denoted by their sister differs from the way in which non-modal adjectives do, in that the extension of a noun modified by a non-modal adjective is a straightforward subset of the extension of the noun alone, whereas the extension of a noun modified by a modal adjective is a subset of a *superset* of the noun.

As proposed in section 2.1, this semantic difference corresponds to an ordering preference, in that modal adjectives generally dominate non-modal adjectives. Certainly, multiple modal adjectives are grouped together within the DP, as we never find $\text{Adj}_{Modal} > \text{Adj}_{Non-modal} > \text{Adj}_{Modal}$ sequences, as in (73):

(73) ?? 'The possible big apparent new sports hall'

The question is, then, how to explain the choice of position of modal adjectives relative to other classes. Multiple modal adjectives themselves are not unheard of[37],

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[37]Their comparative rarity would be explicable because there is a relatively limited set of meanings associated with modal adjectives, and so the potential for either redundancy or contradiction is quite high. For example, co-occurrence of 'apparent' and 'obvious' will be limited because of the semantic

just multiple modal adjectives interspersed with non-modal adjectives, and the relative order of these adjectives among themselves is quite free, as the examples from google in (74) show, so a conception of modal adjectives as unique specifiers of functional heads is also inappropriate.

(74) a. 'The apparent possible explosion of life in the Cambrian period'

    b. 'Possible apparent improprieties'

    c. 'Possible fake evidence'

    d. 'That apparent fake arm'

It is possible to imagine modal adjectives being merged within a separate projection, higher than non-modal adjectives. If these adjectives modified a sister which was of a different type, in some sense, to the type modified by non-modal adjectives, or if the adjectives needed to be in a checking relationship with a certain feature, it would be plausible that each type of adjective were confined to its own projection. This would look, syntactically, like this (ignoring details orthogonal to this point):

(75)

```
            _____
           /           \
       10,000        rice-seeds[X]
                     /        \
               apparent    rice-seeds[X]
                           /        \
                          X       rice-seeds
                                  /        \
                                red      rice-seeds
```
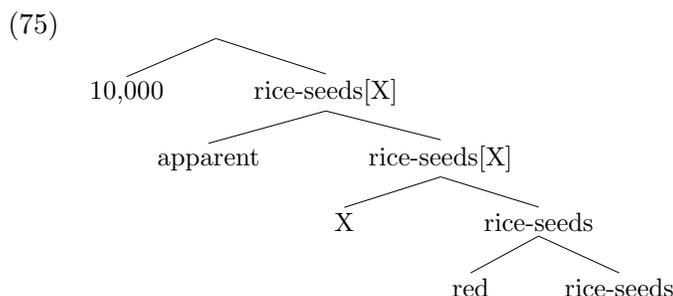
Here, 'rice seeds' projects syntactically, at least as far as the level at which '10,000' is merged, picking up formal and more conceptual features along the way, respectively from the heads and adjectives that merge with it. Only after head or formal feature X has been merged, causing some formal change in the type of the noun, can 'apparent' be merged, while the non-modal adjectives can only be merged below this position. This would give a reasonable approximation to the attested ordering facts. However, it is hard to imagine exactly what kind of head X could be, as it seems intuitively that 'apparent' and 'red' operate on the same type of object. One possibility which cannot be rejected quite as easily is that something in this head X permits the calculation of possible world-related semantics, which are arguably necessary for modal semantics to be feasible. We would probably envisage X as a variable ranging

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clash between the certainty of 'obvious' and the uncertainty of 'apparent', as well as competition from 'apparently obvious', with 'apparent' modifying the Adj 'obvious' rather than the NP.

over sets of possible worlds. The primary way of assigning range to this free variable which is of interest here would be by Spec–head agreement, and, again the existence of freely ordered multiple modal adjectives would militate against a specifier–based analysis, at least under phrase structure theories with a unique specifier position in each phrase. This makes a specifier-based analysis of modal adjectives somewhat unattractive.

There is another, less syntactic, argument, based more on what modal adjectives modify. If, as argued in section 2.3, a modal adjective requires the construction of a superset based on the property denoted by its sister, and then calculation of a subset of this superset, then they are clearly operating on intensions in a much more involved way than non-modal adjectives, which arguably do relatively little more than dynamically add another property to the intension, perhaps in a way related to the dynamic conjunction of Chierchia (1995), and so restrict the extension of the nominal. It would arguably be more informationally efficient for a modal adjective to operate on a more fully specified intension, with more properties, and this would be the default option. However, we do find some cases of non-modal adjectives which are arguably not focalised, but are above modal adjectives. These include the following:

(76)   a. 'A big potential problem is that I change my mind every five minutes.'

    b. 'He had a red fake gun.'

In both of these cases, it seems to me that there is no necessity for either the normal focus intonation or any presupposition of anything related to the sister of the first, non-modal, adjective. Instead, all that needs to be said here is that the highest non-modal adjective is outside the scope of the modal adjective, and so is unaffected by modal semantics. The denotations of the orders $\text{Adj}_{Non-modal} > \text{Adj}_{Modal} > \text{N}$ and $\text{Adj}_{Modal} > \text{Adj}_{Non-modal} > \text{N}$ will therefore be significantly different, and will not always both be appropriate. It is clearly the case in (76b) above that the redness of the gun is irrelevant to the fakeness of the gun, and the redness will usually be quite genuine, and therefore 'red' should be quite appropriate outside the scope of 'fake', for example.

In this case, the restriction noted in (73) above on $\text{Adj}_{Modal} > \text{Adj}_{Non-modal} > \text{Adj}_{Modal}$ order would be related to cognitive factors. Such an order would require the construction of a superset, then a subset, another subset, another superset and another subset, in that order, each on the basis of the previous set. You can almost feel your head aching just reading it. Arguably, such effort would have almost no communicative benefit, as noun phrases are generally only there to pick out and track

referents, which is almost never going to need such massive precision. These orders would then not be absolutely prohibited, so much as vanishingly rare for independent reasons.

Examples such as (76) above show that the $\text{Adj}_{Modal} > \text{Adj}_{Non-modal}$ order is not entirely watertight, and exceptions to it are not always explicable in terms of focus. It seems that an explanation along these semantic and cognitive lines may be able to capture the preferences for certain orders, without banning outright those orders which only occur very rarely. I propose, therefore, that this type of explanation is best suited to capturing relative orders of modal and non-modal adjectives. In that case, it appears that modal adjectives can appear in any position relative to other adjectives, and so I propose that they can appear in either of the positions labelled Adj_2 and Adj_3 in (72) above.

3.3.2 "Subsective" > "intersective" order

Under the semantics of Adj–N orders given above, the traditional conception of "intersective" and "subsective" adjectives no longer has any status, as noted in section 2.1. The presence of ordering restrictions which appear as though they may follow some intuitive intersective / subsective distinction appears, however, to be robust. So size and novelty adjectives, both of which are highly relativised to the semantics of what they modify, dominate adjectives relating to colour, nationality, etc.

One diagnostic seems to tease apart relatively reliably the two classes of adjective, namely the availability of degree markers like 'very', 'rather', comparatives, superlatives, etc. A frequently found claim (in e.g. Larson and Segal 1995) is that 'prototypical adjectives are **gradable** predicates' (Larson and Segal 1995, p.130). This is not always necessarily the case, however: the four main categories of "intersective" adjective discussed in section 2.1 all resist such degree markers to a greater or lesser extent[38]. This is absolutely the case for nationality and material adjectives: as the examples in (77) and (78) show, adding a degree modifier to such adjectives forces a different interpretation of the adjective. Degree markers are decidedly strange with shape adjectives, although more or less interpretable, as in (79). This is even more so in the case of colour adjectives (in (80)), where any oddity of standard degree markers may be due to competition from a set of colour-specific terms such as 'dark',

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[38]This is clearly related, although not identical, to the standard view that only subsective adjectives are dependent on their context for interpretation. See, for instance, the distinction between θ-identification and autonymous θ-marking in Higginbotham (1985).

'bright', 'pale', etc:

(77) a. ?? 'A very wooden floor'

  b. 'A very wooden actor'

(78) 'A very French man' = 'A man who displays many characteristics typically associated with French men' ≠ 'A man who comes from France to a high degree'

(79) ? 'A rather circular table'[39]

(80) ? 'A very red dress'[40]

Kamp (1975) notes that the problems with (77–78) may be due to the derived nature of the adjective, and the fact that nouns do not admit such degree modifiers. However, he continues: '*Blue*, though apparently not derived from a noun, also gives rise to rather strained comparatives. *This is bluer than that* is sometimes a meaningful statement, but would fail to be more often than not.' (Kamp 1975, p.153).

I will assume that the subsective–intersective distinction corresponds to the availability or otherwise of such degree modifiers, in other words that intersective adjectives are distinguished by falling into one of a few classes of more or less "absolute" adjectives, where we could perhaps interpret "absolute" along the lines of Kamp's definition of an 'extensional' adjective:

> 'An adjective $[F]$ is *extensional*. . . if there is a function F' from sets of individuals to sets of individuals such that for every P and w $(F(P))(w) = F'(P(w))$' (Kamp 1975, p.125).

It is not clear whether a syntactic treatment of this ordering distinction is appropriate. Certainly the availability of degree markers does not correspond to the presence or absence of any one of the functional heads argued for in section 2.5. I will represent the ordering distinction as corresponding to merger above or below a functional head, Deg^0, partly for concreteness, and partly because this will prove to be a useful strategy in the analysis of French in chapter 4. This head is to be understood as causing some change in the nominal semantics such that merger of a

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[39] but *cf* 'A roughly circular table'.

[40] *cf* 'A dark red dress', or 'A very red face'. It is clear that the colour adjectives are somewhat problematic for the correlation between intuitively "intersective" adjectives and modification of the adjective by degree markers.

subsective adjective, one modifiable by degree markers, becomes possible, but merger of an "absolute", intersective adjective is no longer possible.

This gives a simple syntactic analogue of the ordering restrictions noted above: adjectives which accept degree markers can only merge above Deg^0 (81a), and adjectives which don't accept such elements can only merge in the absence of Deg^0 (81b), straightforwardly describing the ordering restriction (81c–81e):

(81) a.

Expensive

Deg^0

$Same^0$ cheese

b.

French

$Same^0$ cheese

c.

Expensive

Deg^0

French

$Same^0$ cheese

d. *

French

expensive

Deg^0

$Same^0$ cheese

e. *

```
              /\
         French \
               /\
          expensive \
                   /\
              Same^0  cheese
```
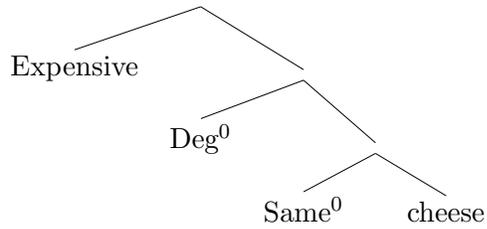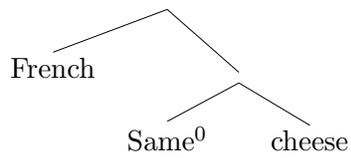
In the following section, I will investigate how this order interacts with a separate ordering restriction on adjectives.

3.4   Adjectives, mass and count nouns

Certain classes of adjective cannot appear in the absence of Div^0. As merger of Div^0 converts mass semantics into count semantics, an adjective which cannot appear without Div^0 is one which cannot appear with mass nouns. Such classes of adjective include size (82a) and shape (82b), while classes which can appear with mass nouns include colour (82c) and nationality (82d) adjectives:

(82) a. ?? 'Big salt was everywhere.'
          ?? 'There was tiny gas seeping in.'

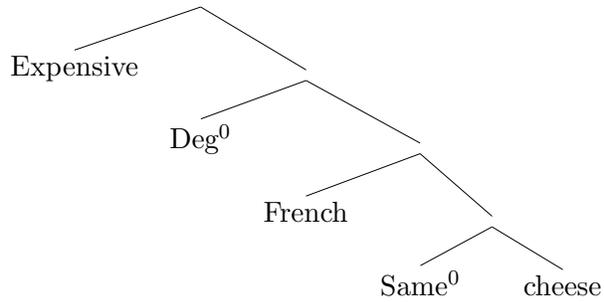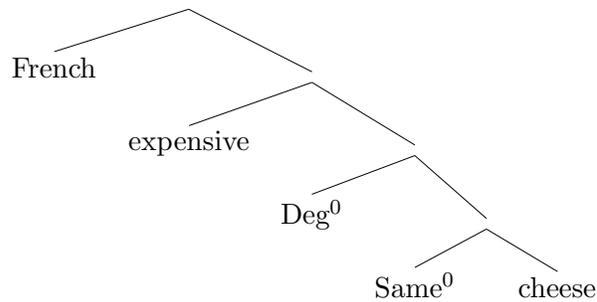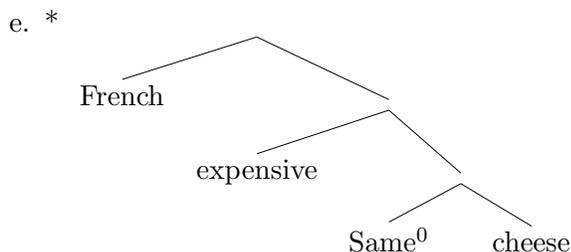   b. ? 'They had circular water in their garden.'
          ? 'Pointed grass was underfoot.'[41]

      c. 'Red liquid gushed all over the floor.'

      d. 'He smeared French mustard on everything.'

Meanwhile, size and shape adjectives are completely unremarkable as soon as the classifier / divider layer, with Div^0, is present, as seen minimally in English in bare plurals:

(83) a. 'Big dogs terrify me.'

      b. 'Pointed blades of grass were underfoot.'

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[41] In keeping with the spirit of Borer (2001), I believe that it is inaccurate to label the examples in (82a–82b) as ungrammatical. Rather, the usually mass nouns are coerced into a classified / divided / count interpretation by the presence of an adjective associated with a higher layer. The ease of finding a new interpretation influences the perceived level of oddness. So, for me, 'pointed grass' is relatively neutral, as an interpretation as 'pointed blades of grass' is fairly natural. However, 'circular water' is much odder, although one could interpret it as a description of a pond, for example, if pushed.

It must be noted straight away that this classification of adjectives cuts across the subsective–intersective divide. Here, size and shape adjectives pattern together, whereas size adjectives pattern with the subsective class and shape adjectives pattern with the intersective class. There is a simple explanation for the prohibition on size and shape adjectives co-occurring with mass nouns, namely that both size and shape adjectives presuppose that the object which they describe is delimited, while mass semantics is, by definition, associated with the absence of such divisions. However, given the convincing arguments in Borer (2001), adopted here in section 2.5, that the mass / count distinction is associated with the presence or absence of a functional head (Div^0, in this proposal), the restriction has a clear syntactic correlate: size and shape adjectives cannot occur in the absence of Div^0.

The interest of this distinction here is its interaction with the intersective–subsective distinction described in the previous section. We now have four possible classes of adjective, illustrated below:

(84) a. Intersective, can occur with mass nouns. e.g. 'wooden';

     b. Intersective, can't occur with mass nouns. e.g. 'square';

     c. Subsective, can occur with mass nouns. e.g. 'expensive';

     d. Subsective, can't occur with mass nouns. e.g. 'big'

The following data from google demonstrates the ordering restrictions among these four classes:

(85) a. 'Big square N': 28,200 hits, e.g. 'Big square table'.

     b. * 'Square big N': 3,700 hits, but no acceptable examples in first 100.

(86) a. 'Expensive wooden N': 1,260 hits, e.g. 'Expensive wooden recorders'.

     b. * 'Wooden expensive N': 4 hits, best example is ?? 'Wooden expensive custom window treatments'.

(87) a. 'Big expensive N': 22,200 hits, e.g. 'Big expensive houses'.

     b. * 'Expensive big N': 5,580 hits, best example in first 100 is ?? 'Its expensive big book'.

(88) a. 'Square wooden N': 9,500 hits, e.g. 'Square wooden coaster'.

     b. 'Wooden square N': 2,190 hits, e.g. 'Wooden square coaster'.

What this data shows is that relative orders of English adjectives are always restricted in that subsective adjectives (capable of being modified by degree markers) always precede intersective adjectives. Furthermore, there is a restriction that adjectives which are not able to occur felicitously with mass nouns precede adjectives which can readily occur with mass nouns, but *this restriction only holds among subsective adjectives.* Relative orders of intersective adjectives are unconstrained by the ability or otherwise of these adjectives to occur with mass nouns — in other words, both subsective and intersective adjectives are also capable of occurring in both of the positions labelled Adj_2 and Adj_3 in (72).

Let's adopt the convention of describing the four classes of adjectives in terms of two features: [$\pm$ mass], representing the ability or inability of an adjective to occur with a mass noun; and [$\pm$ absolute], representing the possibility of using degree markers with the adjective in question. Purely in terms of adjective orders, we could then say that the feature [$\pm$ mass] is "dependent" upon the feature [$\pm$ absolute], in that [$\pm$ mass] only becomes relevant to ordering restrictions in presence of the feature [– absolute], or in other words with subsective adjectives.

Comparing this picture to the proposed DP structure in Borer (2001), however, reveals an interesting discrepancy. In terms of DP-internal functional structure, Borer argues convincingly that $<e>_{DIV}$ (her equivalent to Div^0) had a genuine syntactic reality, in the absence of any adjectives. Meanwhile, as the only function of Deg^0, even if it does have a syntactic reality, is to license subsective adjectives and bar intersective adjectives, it seems highly unlikely that Div^0, responsible for something so fundamental as the mass / count distinction, could be *syntactically* dependent upon the presence of Deg^0. In other words, the linear functional sequence which we can reasonably assume, following Borer (2001) and on the basis of evidence unrelated to adjectives, to be active in the noun phrase, *cannot also be the basis for the major observed adjective ordering restrictions.*

We have, then, an apparent conflict: syntactically, Div^0 is undoubtedly an independent head, whereas the syntactic reality of Deg^0 is dubious. Meanwhile, in terms of complement selection by an attributive adjective head, [$\pm$ absolute], corresponding to Deg^0, is primary, while the [$\pm$ mass] distinction, corresponding to Div^0, is active only in the presence of [– absolute]. This suggests that we are dealing with two loosely, but not strictly, parallel hierarchies, one strictly syntactic, one selectional. These coincide at certain places (for example, the presence of Div^0 corresponds to a

[– mass] interpretation, ruling out [+ mass] interpretations for the rest of the derivation), but diverge at others.

This is exactly the model proposed by Ernst (2002) for adverb ordering restrictions, and is against the arguments of Nilsen (2003), who finds a redundancy in two parallel hierarchies. To me, however, this apparent "redundancy" is quite reasonable, given that the alternative is to say that *every* such ordering restriction is syntactic in nature. This alternative seems unreasonable, given the availability of a very simple and non-syntactic explanation (discussed above) for the absence of 'big' with mass nouns, for example. Meanwhile, the freedom of position of modal adjectives, as seen in section 3.3.1, would be due to this class of adjectives not having any complement-selectional requirements in terms of [± mass] and [± absolute]: these distinctions are generally irrelevant to the lexical semantics of modal adjectives. If I continue to represent the distinction between intersective and subsective adjective fields by the presence or absence of a head, Deg^0, it is clear that this head cannot fit with Div^0 into a single linear functional sequence: both may be dependent on Same^0, but neither head necessarily dominates the other, and no higher functional structure is dependent on the presence or absence of either head.

I will assume, then, that *no* restrictions on orders of this major class of English attributive adjectives (that is, all non-focused pre-nominal adjectives) can be reduced to the independently motivated functional structure in the DP: intersective, subsective and modal adjectives are all available in both the positions Adj_2 and Adj_3, in (72), and the distinction between adjectives available in these two positions is very much a secondary one. Instead, all the major ordering restrictions in these cases come from a separate hierarchy of more semantic divisions which interact with the complement–selectional requirements of different adjectives. This seems to be the most reasonable conclusion, given the evidence in Ortmann (2003) that his MOD and ARG, when overtly realised, are overtly realised identically for all regular attributive adjectives. This strongly suggests that the syntactic and compositional semantic workings of all regular attributive adjectives in a given language are probably identical, so making syntactic distinctions among them is probably unwarranted. Better to let other areas of linguistic competence take the strain.

This concludes the discussion of the central class of adjectives in the DP, those that are syntactically heads. I will now turn my attention to relating these English structures and restrictions to the case of French.

Chapter 4
Deriving French orders

4.1 Introduction

I believe that the above proposals represent a plausible sketch of the extent of the links of the functional structure of DP, independent of attributive adjectives, to well-documented ordering restrictions on English attributive adjectives. The next question, then, is how to relate this structure to an arguably more complex set of ordering restrictions, such as those found in French.

Following the Directionality Principles of Ernst (2002), we would expect potentially to find both pre- and post-nominal adjectives in both English and French, as Ernst claims that adjuncts are linearised both in (leftward) F-Dir and (rightward) C-Dir, where the latter is activated. As a major diagnostic of active C-Dir is SVO order, as displayed, uncontroversially, in English and French, the prediction on the basis of Ernst (2002) would be that adjectives should potentially be found on both sides of the noun in both English and French.

This prediction is borne out, but the types of adjective found on either side of the noun are significantly different in the two languages. The few cases of post-nominal adjectives in English (basically, adjectives with complements as in (89) and a few predicative uses as in (90)) are a relatively small subset of the cases in which adjectives can occur post-nominally in French:

(89) 'A man [proud of his sons]'

(90) 'The members present'
    (*cf.* 'The present members'.)

By far the most obvious difference between the two sets of possible orders is that, in French, intersective adjectives are regularly found post-nominally, while subsective and modal adjectives are generally found pre-nominally. In English, of course, all three classes are almost always found pre-nominally. This results, minimally, in differences such as the following:

(91) 'A *red* car' — 'Une voiture *rouge*'.

This is, however, a simplification of the facts. Most French adjectives can occur either pre- or post-nominally, sometimes with a discernible difference in interpretation, sometimes not[42]. Goes (1999) shows that a quite bewildering array of, often

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[42]The lack of a *discernible* difference in interpretation between Adj–N and N–Adj groups does not, of course, preclude the possibility that similar interpretations were arrived at in the two cases by quite different semantic routes. This is the position I will assume below, as it is both safer and theoretically more desirable to assume a semantic difference between the two possible forms of combination.

conflicting, factors can influence the pre- or post-nominal placement of a French attributive adjective, from the semantics of the adjective and of the noun, through discourse context, region, historical period and text type, to the morphological structure of the adjective, the choice of determiner, the syntax of the DP and the AdjP, and idiosyncratic facts about preferences of certain adjectives. Some of these factors are clearly more amenable than others to a treatment based on the proposals in the preceding chapters, and I will concentrate on these here, noting that, as before, the aim is not to motivate *every* potential adjective order in French, but rather to provide a plausible syntactic and semantic structure for the DP, which also explains the most robust observed ordering restrictions.

As far as possible, the hope is that the same proposals will carry across to English. Cinque (2003) shows that many of the same semantic factors which influence adjective placement in French also have an effect in English, but this is less obvious because of the predominance of Adj–N order in English. The restrictions observed in French may then help to illuminate the structure of the English DP as well.

In the rest of this section, I will firstly expand upon the presentation of the data concerning the distribution and interpretation of adjectives in French given in section 1.2.6 above. Following this, I will evaluate some of the many attempts to accommodate these data in broadly Chomskyan frameworks and investigate how these proposals relate to the functional structure of DP proposed in the preceding sections, relating the findings and modifications back to English adjective orders when pertinent.

4.2   The data

4.2.1   Certain classes of adjective generally appear post-nominally in French

Goes (1999) shows that, among his 'adjectifs primaires', there is a group consisting of 'grand, petit, bon, jeune, beau, vieux'[43] which is found pre-nominally 96.7% of the time in his corpus. We see here a group of canonically subsective adjectives: the property denoted by each is determined to a very large extent by the noun which it modifies.

Also, Waugh (1977) claims that modal adjectives are more acceptable in pre-nominal position. According to Waugh, then, we would find contrasts like the fol-

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[43]'big, little, good, young, beautiful, old'.

lowing[44]:

(92) 'Le   supposé criminel' — ? 'Le   criminel supposé'
     'The alleged criminal' —   'The criminal alleged'

(93) 'Le   futur président' — ? 'Le   président futur'
     'The future president' —   'The president future'

On the other hand, there is a strong tendency for nationality, colour, shape and material adjectives to occur post-nominally, among others. For example, Goes found no pre-nominal occurrences of at least 'nu, vide, fixe, aigu, lisse, bleu, jaune, brun, favorable'[45,46]. Such types of adjective were seen above to be canonical members of the "intersective" group of adjectives.

Furthermore, a lower class of adjectives, which cannot be separated from the noun and which therefore seem to have some of the hallmarks of derivation of complex lexical items, also appear post-nominally in French, as shown by (94):

(94) 'Nervous system' — 'système nerveux'

Here, a 'nervous system' is ambiguous between 'nervous' in the usual sense of the adjective (the sense which is close to 'jittery'), and 'nervous' as it forms a complex noun with 'system' (which we may take as an example of merger below little n in Marantz's terms), referring, roughly, to the brain. Furthermore, any attempt to insert an extra adjective between 'nervous' and 'system', as in (95), forces the usual, supralexical, reading of the adjective to emerge:

(95) 'Nervous computerised system' ≈ 'Jittery computerised system' ≠ 'Computerised brain'

This means that the order in (96a) is acceptable, because the two adjectives belong in different fields, but the order in (96b) is odd, because the meanings of 'calm' and 'nervous' clash:

(96) a. 'He had a calm nervous system.'

     b. # 'He had a nervous calm system.'

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[44]See below for a modification of this view.

[45]'naked, empty, fixed, sharp, smooth, blue, yellow, brown, favourable'.

[46]Other, less central, adjectives which show a strong post-nominal tendency, according to Goes, are 'adoptif' (adoptive), 'ami' (friendly), 'blanchâtre' (off-white), 'carnivore' (carnivorous), 'directeur' (governing), 'galopant' (rampant), 'parlant' (speaking), 'présidentiel' (presidential). These are all either denominal, deverbal or deadjectival adjectives, which marks the derivation of an adjective as another important factor in determining its position. I will ignore this in what follows, however, concentrating on more central examples of adjectives.

Note, now, that only the supralexical meaning is available pre-nominally in French:

(97) 'un nerveux système' $\neq$ 'un système nerveux'

Pre-nominally, 'nerveux' can only mean something akin to 'jittery'. It seems very much, then, that the lowest adjective field, below Same^0, is also only available post-nominally.

As a first, descriptive, approximation, then, adjectives with intersective or "lexical formation" meanings appear post-nominally, while subsective, modal and focused adjectives appear pre-nominally.

4.2.2   The opposite orders are also sometimes possible

So far, so good. The data presented above show a simple and systematic difference between English and French adjective positions, in that adjectives merged relatively low in the DP end up before the noun in English, but after the noun in French. Such data could clearly be described by a transformational analysis such as the N^0-movement proposal of Cinque (1994), the roll-up movement analysis of Cinque (2003), or the hybrid analysis of Laenzlinger (2000).

However, in many cases, adjectives can occupy the opposite position to that which the above predicts. We can, then, in certain circumstances, find colour adjectives pre-nominally, as well as post-nominally, as illustrated in (98); subsective adjectives post-nominally as well as pre-nominally, as in (99), and (*contra* Waugh 1977, but as shown in *Le Petit Robert*) modal adjectives post-nominally as well as pre-nominally, as in (100):

(98) a. 'Des   feuilles vertes'
       'Some leaves   green'
       'Green leaves'

    b. 'Ma verte prairie'
       'My green meadow'

(99) a. 'Un grand homme'
       'A   big   man'
       'A tall man / a great man'

    b. 'Un homme grand'
       'A   man   big'
       'A tall man'

(100) a. 'Le   futur   président'
        'The future president'
        'The president of the future'

     b. 'Le   président futur'
        'The president future'
        'The person who will be president in the future'

The clearest example of this phenomenon is the case of 'ancien', which has a modal meaning, akin to 'former', available in pre-nominal position, yet, post-nominally, can only have a non-modal, but related meaning, roughly 'old'[47]:

(101) a. 'Une ancienne église'
        'A   old   church'
        'A former church'

     b. 'Une église   ancienne'
        'A   church old'
        'An old church'

For Waugh (1977), there is inevitably a semantic difference accompanying the different orders, while Goes (1999) gives many examples, such as those in (102), where the meanings in the two orders appear basically identical:

(102) a. 'Une masse énorme' ≈ 'Une énorme masse' ≈ 'An enormous mass'

     b. 'La   célèbre statue de la   liberté'
        'The famous statue of the liberty'
        'The famous statue of liberty'

        'La   statue célèbre du   Sphinx'
        'The statue famous of-the Sphinx'
        'The famous statue (that is) the Sphinx'

Despite such examples, I will assume, with Waugh, that there is always some semantic difference between pre-nominal and post-nominal position. For example, although the meanings in the above cases are very close, I believe that pre-nominal 'énorme' has greater emphasis than it does in post-nominal position, and that pre-nominal 'célèbre' is interpreted as denoting a property which is presupposed as inherent to the noun, while post-nominally, the adjective seems instead to function in a more traditional, "intersective", way. If pre-nominal 'célèbre' is interpreted as

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[47]A qualification to this is raised by Goes (1999), namely that 'Une très ancienne église' only has the meaning 'A very old church'. More broadly, pre-nominal 'très' often has the effect of forcing the post-nominal reading of an adjective in pre-nominal position.

specifying a property inherent to the noun, then the intension doesn't change and the extension is not restricted — instead, our attention is drawn to a property already presupposed as a property of the nominal. If post-nominal 'célèbre', on the other hand, is not interpreted as a property inherent to the noun, then the intension *does* alter, and even if, in this world, the extension is unaffected by post-nominal 'célèbre', this is not necessarily the case. In other words, the effect of pre-nominal 'célèbre' is that, in every possible world, every possible object in the extension of the noun will also be famous, whereas post-nominal 'célèbre' admits the possibility of possible worlds containing objects in the extension of the noun which are not also famous, even if, in the real world, every object in the extension of the noun is also famous.

Returning, then, to the examples in (98–100), we find roughly the following meaning shifts: in (98), pre-nominal 'verte' is interpreted as an inherent property of the noun it modifies, and is also emphasised; in (99), post-nominal 'grand' (which, according to Goes 1999, accounts for only around 4% of occurrences of 'grand') loses any ambiguity between 'great' and 'big', in favour of the latter. Furthermore, Goes claims that the comparison class is altered, so that post-nominal 'grand' is 'big' compared to the meaning of the hyperonym of the noun it modifies: pre-nominal 'grand' in (103a) is relativised to other butterflies, while post-nominally, in (103b), the comparison class is perhaps other animals, instead, which would explain the oddity of that order[48]:

(103) a. 'Un grand papillon'
       'A   big   butterfly'

    b. # 'Un papillon grand'
       'A   butterfly big'

Finally, in (100), the post-nominal adjective 'futur' interacts less closely with the noun. While 'le président futur' denotes a non-specific person who will be president in the future ('The person who will be president in the future, whoever that may be'), this is not the case with pre-nominal 'futur'. 'Le futur président' instead describes a specific person who is distinguished because he will one day become president. Such a distinct interpretation is also compatible with all the examples of post-nominal 'futur' in *Le petit Robert*:

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[48]Google produces no acceptable examples of 'papillon grand' in this construction, but several hundred of 'grand papillon'. If, following Goes (1999), 4% of occurrences of 'grand' are post-nominal, such an absence would otherwise perhaps be surprising.

(104) a. 'Les générations futures'
   'The generations future'
   'Future generations'

  b. 'Les siècles   futurs'
   'The centuries future'
   'Future centuries'

  c. 'Besoins actuels et   futurs'
   'Needs   current and future'
   'Current and future needs'

  d. 'L'   évolution future de l'   humanité'
   'The evolution future of the humanity'
   'The evolution of mankind in the future'

  e. 'La   vie future'
   'The life future'
   'The afterlife'

Obviously, in many cases, the interpretations of pre- and post-nominal adjectives are very close. Especially given the regional, historical and stylistic variation in adjective position claimed by Goes (1999), the syntax and semantics of the different French attributive adjective positions must be distinct enough to have some predictive value, but yet with enough potential overlap between interpretations in different positions to allow such variation.

4.2.3   Possible scope ambiguities in French

A further challenge for a syntactic account of French adjective orders is to provide a structure which is flexible enough to allow for certain scope ambiguities between adjectives on opposite sides of the noun. I will assume that, as in English, a leftward pre-nominal adjective has scope over a rightward one. This is borne out by examples such as the following:

(105) 'L'   admirable futur président'
  'The admirable future president'

In French, as in English, 'admirable' is outside the scope of the modal 'futur'. As we would then expect, we interpret 'admirable' as applying at the time of utterance, rather than in the future. This suggests that French pre-nominal adjectives have scope as in English.

As for post-nominal cases, claims have been made both that a leftward adjective has scope over a rightward adjective (Cinque 1994), that the opposite is true (Lamarche 1991, Bouchard 1998, 2002, Cinque 2003), or that either scope order may be found (Laenzlinger 2000). Of these, Laenzlinger represents very much a worst case scenario for any syntactic analysis, and his data does not seem necessarily to bear that position out, relying as they do on conceptually-based adjective ordering restrictions as in Cinque (1994) or Scott (1998). Given the arguments against such restrictions in earlier sections, Laenzlinger's examples are not valid here.

Laenzlinger, as with Cinque (1994), takes orders as in (106) as evidence for post-nominal adjective orders which are similar to pre-nominal orders.

(106) 'Un chou   *blanc chinois*'
      'A   cabbage *white Chinese*'
      'A *white Chinese* cabbage'

Note, however, that scope has relatively little effect on interpretation of the overall DP in this case, as both adjectives are canonical intersective adjectives. Note also that, according to the proposals above, either order of these two adjectives should then be possible. This is, in fact, borne out by google:

(107) 'Blanc chinois': 108 hits.
      'Chinois blanc': 119 hits.

The evidence, for example from Bouchard (2002), for mirrored scope relations, is much more compelling. If we take two adjectives from the same class, as in (108), we find that their order, post-nominally, in French is the opposite of that in English. The same is true in the case of translations of the multiple past participles from Svenonius (1994) (in (109)):

(108) 'Des   mesures   techniques brutales'
      'Some measures technical   brutal'
      'Brutal technical measures'

(109) a. 'Du   poulet surgelé haché'
         'Some chicken frozen chopped'
         'Chopped frozen chicken'

      b. 'Du   poulet haché   surgelé'
         'Some chicken chopped frozen'
         'Frozen chopped chicken'

In such cases, we see the scope effects much more clearly, and they are the mirror image of pre-nominal scope patterns.

We see, then, that a leftward pre-nominal adjective has scope over a rightward one, and that a rightward post-nominal adjective has scope over a leftward one. This leaves the question of scope relations among pre- and post-nominal adjectives. Here, according to Bouchard (1998, 2002), we find genuine ambiguity. He gives the following example:

(110) 'Les présumés professeurs chinois malhonnêtes'
      'The alleged   professors   Chinese dishonest'
      'The alleged dishonest Chinese professors' or
      'The dishonest alleged Chinese professors' or
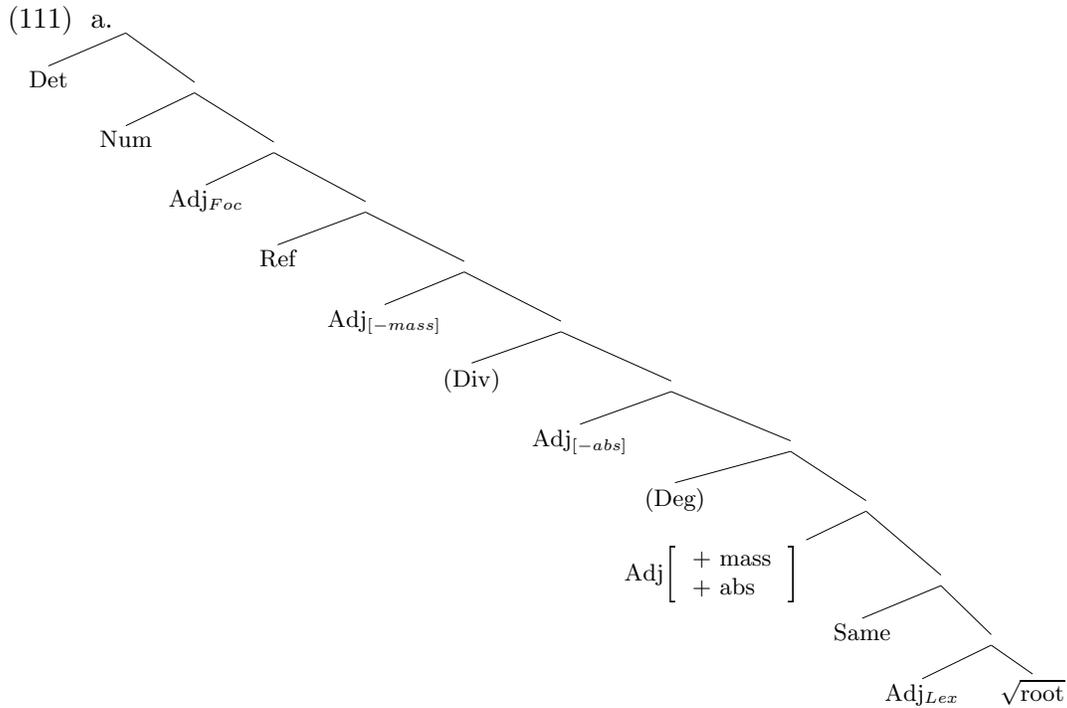   'The dishonest Chinese alleged professors' (Bouchard 1998, p.165).

Here, relative scope among pre-nominal or post-nominal adjectives works as predicted by the above. However, the pre-nominal adjective may or may not take scope over any amount of post-nominal adjectives. In this case, the full account of scope relations in French would appear to be that leftward pre-nominal adjectives take scope over pre-nominal adjectives to their right; rightward post-nominal adjectives take scope over post-nominal adjectives to their left; and there is potential scope ambiguity between pre- and post-nominal adjectives.

Having said that, I do not believe that all three readings in the above example are equally accessible. Instead, the third reading, in particular, with multiple wide-scope post-nominal adjectives, seems less likely than the other two. To my ears, the most natural reading is with wide-scope 'présumés'.

4.3   Previous analyses

Below is a summary of the DP structure and selectional restrictions argued for in the preceding sections[49]:

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[49]This is, in fact, a simplification of the structures proposed in chapter 3, as it was argued there that Deg^0 and Div^0 could not easily be accommodated in a simple functional sequence. The order presented in (111) is the one which shows the noted ordering restrictions in the neatest way, but nothing I have suggested forces this relative order of Deg^0 and Div^0.

(111) a.

```
Det
   \
    Num
       \
        Adj_{Foc}
            \
             Ref
                \
                 Adj_{[-mass]}
                     \
                      (Div)
                         \
                          Adj_{[-abs]}
                              \
                               (Deg)
                                  \
                                   Adj [ +mass ]
                                       [ +abs  ]
                                          \
                                           Same
                                              \
                                               Adj_{Lex}   √root
```

b. Adj[– absolute] > Adj[+ absolute]

$$\text{Adj} \begin{bmatrix} -\text{ absolute} \\ -\text{ mass} \end{bmatrix} > \text{Adj} \begin{bmatrix} -\text{ absolute} \\ +\text{ mass} \end{bmatrix}$$

With regards to the above facts concerning adjective position, a clear generalisation emerges: the lower categories, lexical and intersective adjectives, occur to the right of the noun, with scope relations that are the mirror image of those among pre-nominal adjectives[50]. This is as would be expected on an analysis where such adjectives are merged post-nominally (Bouchard 1998, 2002), or end up in post-nominal position as a result of roll-up movement (Cinque 2003), but not if they end up post-nominally as a result of head movement (Cinque 1994). A further possibility is given by Alexiadou (2001), who develops the proposal in Kayne (1994) that all attributive adjectives, pre- or post-nominal, are derived from a post-nominal predicative structure, with raising determining the eventual relative positions of the nouns and adjectives.

Any analysis which generates the correct configurations raises questions. In the case of an account which allows both pre- and post-nominal merger of adjectives, we

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[50]Although there may be a numerical preference for post-nominal adjectives with mass nouns, I presume that this is related to the numerical predominance of certain very common subsective adjectives, such as 'grand' ('big'), which are incompatible with mass nouns. I do not believe that there is a necessary correlation between pre- or post-nominal adjective position and mass or count semantics of the noun.

should ask what factor(s) determine the position in which the adjective is merged, as the choice is clearly not free: many adjectives show a strong preference for one or the other position, and meaning differences are common, if not ubiquitous, with differences in position. On the other hand, the roll-up movement analysis, as always, leads one to wonder exactly what drives the movement towards that particular landing site, and, if movement is indeed driven by uninterpretable features, as Chomsky (1995) claims, whether there is any cross-linguistic correlation between the presence or absence of such movement and the overt morphology of a given language, or whether the precise featural specification which leads to such an overt configuration must remain abstract or undiscovered. Similarly, Alexiadou's analysis raises the questions of the nature of the predicative construction and of what drives particular cases of raising.

All in all, the analysis in terms of different positions of merger is probably to be preferred if there is a correlation with the way in which the semantic combination takes place. If, on the other hand, we conclude that there is not necessarily such a difference, the movement-based analysis is preferable, bearing in mind that Move is assumed to be driven by non-semantic factors.

Overall, I believe that all these analyses have advantages in certain cases. Wide-scope post-nominal adjectives seem better suited to an analysis in terms of post-nominal Merge in a predicative construction, while narrow-scope post-nominal adjectives seem better accounted for by roll-up movement analyses. No analysis, however, seems capable of handling all the relevant data alone. To this end, I will examine the problems with prominent examples of all three types of analysis.
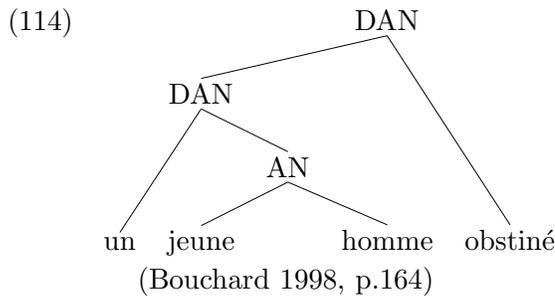
4.3.1   Bouchard (1998, 2002): 'Integral Merging'

In these two works, Bouchard develops a theory which attempts to determine the position of an adjective based on what it modifies. His starting point is the observations that, firstly, liaison is very frequent between an adjective and noun, but not the other way round (see (112) below); and secondly, many types of complex AdjP can only appear post-nominally in French, as in English: adjectives with complements, for example, can only occur post-nominally. This is illustrated in (113) below:

(112) a. 'Les (/z/) énormes   (/z/) éléphants'
            'The   enormous   elephants'

      b. 'Les (/z/) éléphants (? /z/) énormes'
            'The   elephants   enormous'

(113) a. 'Un gros garçon'
           'A   fat   boy

       b. ? 'Un garçon gros'
             'A   boy   fat'

       c. * 'Un [gros comme une maison] garçon'
             'A [big like   a   house] boy'

       d. 'Un garçon [gros comme une maison]'
           'A boy   big   like   a   house'
           'A boy as big as a house'

Bouchard takes this as evidence that pre-nominal adjectives are merged lower in the tree than post-nominal adjectives. A tree with both pre- and post-nominal adjectives, for him, is as follows:

(114)

```
                              DAN
                             /    \
                   DAN            \
                  /    \           \
                        AN          \
                       /   \          \
              un   jeune   homme   obstiné
```

(Bouchard 1998, p.164)

The semantic correlate of this difference in the height of merger is that French pre-nominal adjectives modify some internal component of N, combining to create a single complex functor category. Bouchard (2002) provides a list of these internal components which may be modified by pre-nominal adjectives, consisting of the characteristic function f, the time interval i, possible world w and variable assignment function g. Also, a pre-nominal adjective may be 'added to the property interpreting the N... or may somewhat quantify over one of these subcomponents of N... or may involve both quantification and addition to the property interpreting the N' (Bouchard 1998, p.144). If an adjective has any of these functions, it will occur pre-nominally, while (broadly) intersective, or "external", modification of N will take place in post-nominal position.

This is formalised by Bouchard as follows:

'The functor category precedes its saturator or modifier in French. (i.e., the head precedes its complement or adjunct in French)' (Bouchard 1998, p.155).

This is also said to apply to English. However, it applies only in an 'Elsewhere' manner: when an adjective modifies its sister externally, the order is determined directly, but when an adjective modifies an internal component of its sister, 'not the whole N as a full closed off functor category' (Bouchard 1998, p.155), the relationship is not a functor–modifier one, so the head–adjunct order doesn't hold and we get Adj-N order.

The differences between French and English adjective orders are then linked by Bouchard to the position where Number is realised in the two languages: on Det in French, and on N in English[51]. Number is taken as a necessary feature of a DP, if it is to refer (along with values for definiteness, specificity, demonstrativity, etc.)[52]. This leads Bouchard to the following conclusion:

> 'If we assume that Number must be a property of the nominal functor category, then when Number is coded on Det as in French, the Det must somewhat be part of the nominal functor category: the Det must cliticise to it in a way similar to pre-N adjectives. In contrast, the Det in English forms an independent syntactic head' (Bouchard 1998, p.160).

This leads to the following contrast between English and French:

> 'In French, Number is on Det. Therefore, by an Elsewhere application of the Linearisation Parameter, a bare ADJ in prenominal position may relate to a subpart of the network of the N it combines with; conversely, a bare postnominal ADJ may relate to the whole network of the N. On the other hand, in English, Number is on the N. Therefore, a bare post-nominal ADJ cannot relate to the N alone, but only to the atomised N+Number: so only a special kind of argument-taking ADJ can appear in this position, because only such an ADJ has the semantics to appropriately modify an element with the semantics of an atomised N. Other "regular" bare ADJs must relate to the N alone' (Bouchard 2002, p.175).

Bouchard's theories are too intricate to reproduce here in full, but this is enough to grasp the central argument: the position of attributive adjectives relative to the noun is determined in both French and English by the same Linearisation Parameter: the functor category precedes its saturator or modifier. When this parameter applies, adjectives should be realised after the noun. However, the parameter only applies to closed off functor categories. French adjectives may be realised pre-nominally, if they modify one of the sub-components of the noun, and if they are merged before

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[51]There are, of course, clear exceptions to this, but it is at least very regularly the case.

[52]As 'from a CI perspective, Number is a minimal means to atomise a set and provide access to individuals, i.e., to determine the extensity of a nominal expression' (Bouchard 2002, p.172).

Det (bearing Number) 'closes off' the functor category. Meanwhile, in English, the noun is marked for number, so forming a complex category, N+Num. As an adjective modifies N rather than N+Num, the relationship is not with the complete functor category, and so English adjectives are linearised in the "Elsewhere" pre-nominal position.

There are two serious problems with this account. Firstly, the assumption that number is essential to 'determine the extensity of a nominal expression' ignores the existence of mass nouns, which undoubtedly refer, and yet, by definition, are un-marked for number.

Secondly, Bouchard's theories make the strong prediction of a cross-linguistic correlation between whether number is marked on the determiner or on the noun, and whether post-nominal adjectives are regularly available or not. This correlation is certainly not watertight.

A pertinent case in this respect is Old French[53]. Here, number is coded in a way which has more in common with English than with Modern French. Feminine nouns generally mark the plural with '-s', as do masculine nouns in oblique case, while masculine nouns in nominative case mark the singular by '-s', which is absent in the masculine nominative plural. Although the masculine oblique and feminine definite article systems are essentially as in modern French, the masculine nominative determiner is 'li', invariant with number:

(115) Plural marking on N in Old French:

		nom	*obl*			*nom*	*obl*
masc:	*sg*	N-s	N	fem:	*sg*	N	N
	pl	N	N-s		*pl*	N-s	N-s

(116) Old French definite article system:

		nom	*obl*			*nom*	*obl*
masc:	*sg*	Li	le	fem:	*sg*	la	la
	pl	Li	les		*pl*	les	les

There are two salient facts that emerge from these tables. Firstly, although there is a paradigmatic oddness about the masculine nominative, the marking of a DP as [± pl] is generally recoverable from the presence or absence of '-s' (or some irregular allomorph) on the noun, in conjunction with the DP's participant role. Secondly, there is one case (the masculine nominative) where number is not overtly marked on

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[53]Bouchard discusses Old French in a footnote. His description of the adjective ordering facts, based on Wilmet (1986), assumes predominantly pre-nominal adjectives, in which case there would be no problem. I find this hard to reconcile with any data I have seen.

the determiner. So far, this constitutes slight evidence that number is not 'coded on Det', in Bouchard's terms, in Old French.

This evidence is greatly reinforced by the fact that, whereas a determiner is obligatory in nearly every Modern French noun phrase, with the definite article the unmarked option (frequently occurring with no implication of definiteness), determinerless noun phrases were common in OF, with the definite article only occurring in definite contexts. Foulet writes that:

> 'Dans la langue moderne on peut dire qu'en règle générale tout substantif est accompagné d'un article; les exceptions se trouvent ordinairement dans des locutions toutes faites qui remontent à plusieurs siècles dans le passé. L'article tend ainsi à devenir une sorte de simple signe grammatical qui annonce un substantif, à peu près comme la terminaison *-er* indique un infinitif. Au moyen âge sa fonction est bien vraiment de marquer la détermination. Dès qu'un substantif est pris dans un sens vague et indéfini, dès que les limites de son extension s'effacent un peu, l'article disparaît'[54] (Foulet 1928, p.49).

We therefore frequently find both bare plurals and bare singulars[55], and bare mass nouns. Foulet quotes the following from *Le jeu de la feuillée*:

(117) 'Et   com plus fiere   se   tenoit,
      'And as   more proud(fem) REFL held(3sg),

      Plus et   plus croistre   en mi faisoit
      More and more grow(inf) in me made(3sg)

      Amour et   désir et   talent.'
      Love   and desire and eagerness.'

      'And as she stood more proudly, more and more she made love and desire and eagerness grow in me'.

A language where number is reliably coded on the noun, but not always on the determiner, and bare singulars, plurals and mass nouns are found, is clearly much closer (if not identical) to Bouchard's characterisation of English than of French, and the sensible thing to claim is that number is coded on the noun. However, the classes of adjective attested in pre- and post-nominal positions are nearly identical

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[54]'In the modern language, one might say that, as a general rule, every substantive is accompanied by an article; the exceptions are usually found in frozen expressions which date from several centuries ago. The article therefore tends to become a sort of simple grammatical sign heralding a substantive, in roughly the same way that the ending *-er* signals an infinitive. In the middle ages, its function really is to mark determination. Once a substantive is interpreted in a vague and indefinite way, as soon as the limits of its extension become a little indistinct, the article disappears.'

[55]Though I am unsure how far the bare singular was used: it is still found today in fixed expressions, especially involving professions ('je suis médecin' — 'I am a doctor').

to the situation in Modern French. Although the incidence of pre-nominal adjectives is higher in at least Early Old French texts than today, I believe that this is at least partly due to the predominance of (overwhelmingly prenominal) 'bon, grant' etc. in these texts. There are few adjectives which have unequivocally changed the position in which they are predominantly found between OF and ModF, and there is clear evidence for the post-nominal field being routinely available. Consider, for example, the first three lines of *La chanson de Roland*, from around 1100:

(118) 'Carles   li   reis, nostre emperere magnes,
     'Charles the king, our   emperor   glorious

    Set   anz   tuz pleins ad   estét en Espaigne,
    Seven years all full   has been in Spain

    Tresqu' en la   mer cunquist   la   tere altaigne.'
    Until   in the sea conquered the land high'

        'King Charles, our glorious leader,
        For fully seven years had been in Spain,
        And conquered everything from the high land to the sea.'

Already, here, we have three noun phrases with postnominal adjectives: 'nostre emperere magnes', 'set anz tuz pleins' and 'la tere altaigne', and this is not exceptional with regard to the rest of the poem. So Bouchard's attempt to relate the locus of morphological coding of number to availability of adjective fields, does not hold in at least this case. If this is so, we lose both central elements of Bouchard's proposals for determining attributive adjective placement.

Note, however, that both of these problems concern the motivation for placing an adjective in one or the other position. There is nothing in the above criticism which directly disfavours a movement-free analysis of Romance adjective position, merely this particular implementation of such an analysis.

4.3.2   Alexiadou (2001): A predicative source for most adjectives

The account of Romance ordering facts given in Alexiadou (2001) builds on the proposal in Kayne (1994) of a predicative small clause source for all adjectives, and on the suggestion of Bernstein (1993) that adjectives can be divided into X^0s and XPs. Alexiadou rejects the small clause as a source of all adjectives, as there are the well-known cases, as in (119), of adjectives which are not found in predicative constructions (these adjectives are also discussed in Bernstein 1993, and in section 3.1 here):

(119) a. 'Marya is a former dancer.'

    b. * 'Marya is former, and Marya is a dancer' (Alexiadou 2001, p.230)

Alexiadou argues that these adjectives should be treated as pre-nominal A^0s selecting an NP complement. She also extends this analysis to the pre-nominal reading (the one unavailable in predicative constructions) of clearly ambiguous adjectives such as 'ancien' (see (101) above), and to pre-nominal non-restrictive readings of other adjectives[56].

All the remaining readings and constructions are derived from underlying Kaynean small clause structures, as in (120):

(120) a. $[_{DP}$ The $[_{CP}$ $[_{DP}$ mother$_j]$ C^0 $[_{IP}$ t_j ... $[_{AP}$ proud of her son$]]]]$

    b. $[_{DP}$ The $[_{CP}$ $[_{AP}$ yellow$_j]$ C^0 $[_{IP}$ $[_{DP}$ car$]$ ... $t_j]]]$ (Alexiadou 2001, p.232)

Romance would differ from English in that the AP would raise to [Spec, CP] in fewer cases, giving more post-nominal adjectives in Romance than in English.

I believe that this analysis raises more questions than it solves. Note, firstly, that we could just as easily produce the ungrammatical derivations in (121) under this proposal:

(121) a. * $[_{DP}$ The $[_{CP}$ $[_{AP}$ proud of her son$]_j$ C^0 $[_{IP}$ $[_{DP}$ mother$]$ ... $t_j]]]$

    b. * $[_{DP}$ The $[_{CP}$ $[_{DP}$ car$_j]$ C^0 $[_{IP}$ t_j ... $[_{AP}$ yellow$]]]]$

This is particularly problematic as, when we are treating both post-nominal bare adjectives and adjectives with complements as complete phrases, it is hard to see how the presence or absence of a complement would make any difference to the ability of that phrase to move to [Spec, CP], and so appear pre-nominally.

A second problem is acknowledged by Alexiadou herself, namely that there is no clear way, within the uniform Kaynean structure proposed, to account for any post-nominal or many pre-nominal ordering restrictions among multiple adjectives, as the small clause structure, as it stands, requires recursive embedding of a DP within a CP, within a DP within a CP, etc. This is a serious problem for any

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[56]It is not clear to me that Bare Phrase Structure, as outlined in Chomsky (1995), would allow a distinction between X^0s and XPs in this sense, as the default assumption with a phrase consisting of a single item would be that it is both minimal and maximal, whether pre- or post-nominal. This could be seen as an advantage of the sketch of the specifier–sister and head–complement distinctions to be presented in the appendix: if "head" and "XP" can be defined in terms of the relationship of these elements to their sisters then a division of adjectives into these two categories becomes feasible again.

account, such as the one proposed here, in which ordering restrictions are derived from a hierarchy of some sort, as every structural position is available for merger of an adjective in every iteration of the DP–CP structure, and so a link between a modifier's interpretation and its structural position would be no use, in Alexiadou's theory, in deriving adjective ordering restrictions.

But, to me, the insurmountable problem with Alexiadou's model is that it predicts a predicative source for every post-nominal adjective. As shown by (122) below, there are adjectives which are strongly ungrammatical in copular constructions, but which, as we saw in section 4.2.2, can appear post-nominally:

(122) a. * 'Le   président est futur.'
             'The president is   future.'
         'Le   président futur'
         'The president future'
         'The future president'

    b. * 'La   chaleur est solaire.'
            'The heat   is   solar.'
        'La   chaleur solaire'
        'The heat   solar'
        'Warmth from the sun'

Once we admit such examples, it becomes clear that not every post-nominal adjective can have a predicative source, so we must reject Alexiadou's proposals.

As with Bouchard's proposal above, however, a problem with a particular class of examples does not necessarily rule out this analysis for every case, but simply shows that it is not capable of being satisfactorily generalised to all relevant cases.

4.3.3   Roll-up movement

Cinque (2003) presents a variety of data from English and Romance showing that various ordering-related restrictions on adjective interpretation, many of them not touched upon here, apply post-nominally in Romance with scope effects the mirror image of those found among English pre-nominal adjectives. Cinque also offers a roll-up movement analysis of these orders. If we are not necessarily subscribing to a theory of word order such as the LCA, which would proscribe Bouchard's alternative account above, then whether or not we accept this analysis must depend on how it compares to the alternatives.

If we take as our starting point that choice of pre- or post-nominal position for a given French adjective is not arbitrary, which seems reasonable on both empirical and theoretical grounds, then there are at least two factors which could, theoretically, determine on which side of the noun an adjective is pronounced. Either, in the line of inquiry followed by Ernst (2002), for example, the position could be a reflex of the nature of the relationship between the two sisters[57], in which case a roll-up movement analysis would be unjustified, or else there is no clear link between the semantic relationship of the two sisters and the order in which they are linearised, in which case a roll-up movement analysis is more acceptable.

I believe that, in the case which represents the largest difference between English and French orders, namely that of intersective adjective position, the latter possibility is more promising, for several reasons. Firstly, we saw above that the types of adjective interpretation on either side of the noun are fairly diverse. Pre-nominally, we find subsective, modal and focused adjectives, plus non-restrictive interpretations of qualitative adjectives. Meanwhile, post-nominally, we find intersective adjectives, plus adjectives which have much in common with lexical compounding, and (following Cinque 1994 and to be discussed in section 4.4.1 below) a position which functions as a secondary predication site.

As, in section 2.3 and chapter 3 above, I was arguing for a uniform basis for the compositional semantics of intersective, subsective and modal attributive adjectives, it would be inconsistent to claim now that there was a fundamental difference between the way these adjectives combine in pre-nominal and post-nominal position. Also, I can see no clear difference between standard attributive adjective use in French[58] and in English that would allow us to claim that standard French attributive adjectives combined with their sisters in one of two different ways, corresponding to pre- or post-nominal position, but that standard English attributive adjectives always combined with their sisters in the same way.

If it is the case that there is a uniform type of semantic combination of attributive adjectives and their sisters, at least in the case of standard uses of these adjectives, and so no clear way to relate the ordering differences between English and French

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[57]In Ernst's proposal position is often undetermined by the form of this relationship, but is further influenced by factors relating to some form of morphophonological weight. Although it is possible that this is relevant in certain cases, particularly those of light primary adjectives occurring pre-nominally and many syntactically complex adjuncts occurring post-nominally, the issue is too far from my primary concerns here to investigate.

[58]By 'standard', I mean non-focused, not clearly in a secondary predicate-like construction, not clearly part of some internally complex lexical item, etc.

to a semantic distinction, and if it is also the case that the ordering differences can be accommodated relatively unproblematically within a movement analysis, then this latter analysis is probably preferable, at least for standard cases of attributive adjectives. I will now sketch how this would proceed.

We might assume that, whenever an adjective is merged, its sister moves past it into a feature-checking configuration, eventually targeting [Spec, Deg]. I give a sample derivation for adjectives above Same^0 below[59]:
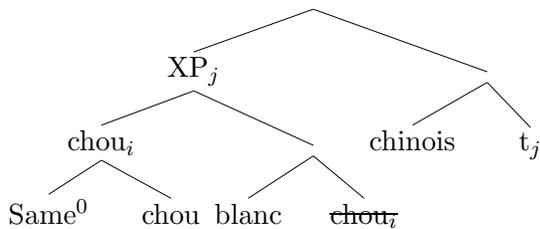
(123) a. Merge of Same^0 above lexical root:

$$
\begin{array}{c}
\text{chou}_i \\
\diagup\diagdown \\
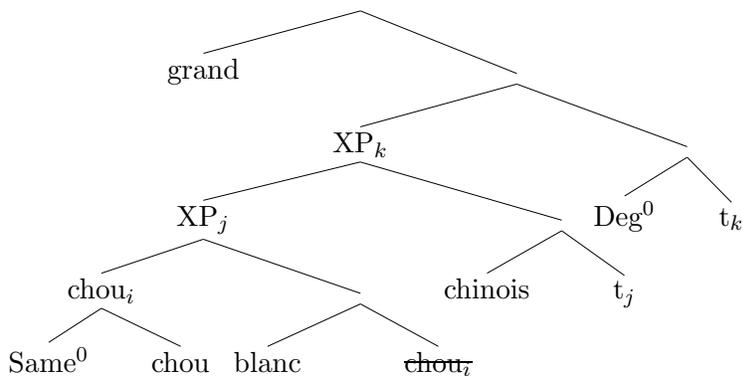\text{Same}^0 \quad \text{chou}
\end{array}
$$
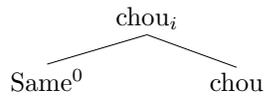
b. Merge of first Adj with NP, NP moves past Adj:
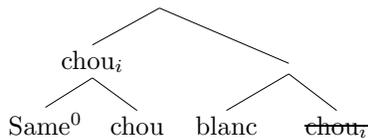
c. Merge of second Adj, NP + first Adj move past second Adj:

d. Merge of Deg^0, roll-up movement of its sister, and merge of further adjectives with no further movement:

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[59]This leaves open the specifics of whether adjectives below this position are post-nominal as a result of movement or Merge in that position, as there is clearly a distinction to be drawn at some level between the nature of adjectives above and below Same^0.

This approach would at least generate the correct orders for pre-nominal subsective, modal and focused adjectives, and post-nominal "lexical" (i.e. sub-Same^0) and intersective adjectives, without relying on a difference between the semantics of these classes. Furthermore, Demonte (1999) has some evidence from Spanish, which shows similar (although admittedly not identical) adjective orders, which would be compatible with this analysis. In Spanish, post-nominal adjectives always have plural agreement when modifying co-ordinated singular NPs, as in (124). However, pre-nominal adjectives modifying co-ordinated singular NPs have singular number, as in (125), and gender agreement is not always necessary in pre-nominal adjective sequences, as in (126):

(124) 'Presunción y   osadia   **inexcusables**'
      'Vanity   and audacity unforgivable

(125) a. 'Su   **distinguido**   mérito y   servicio'
         'His-sg distinguished-sg merit   and service'

      b. * 'Sus   **distinguidos**   mérito y   servicio'
           'His-pl distinguished-pl merit   and service'

(126) 'El   gran buen rey'   — 'El   rey   grande (y) bueno'
      'The great good king'   'The king big   and good'
      'The great good king' — 'The big and good king'
      (All examples from Demonte 1999, pp.68–69)

Demonte takes these patterns as indicative of covert movement of the features of one conjunct, rather than the conjoined phrase as a whole, to check features of pre-nominal adjectives, while features of post-nominal adjectives are not checked by covert movement. While her analysis does not assume overt movement as the cause of post-nominal adjectives, it is compatible with such an analysis, if we assume (as she does) that overt stranding of one conjunct is inadmissible, in that it indicates a difference in the nature of agreement between a noun and pre-nominal adjective, on the one hand, and a noun and post-nominal adjective, on the other, and therefore could be seen as giving some support to an analysis such as mine above.

This analysis does not yet, however, generate all the scope orders attested in Bouchard (1998, 2002), and repeated in (110), as it predicts that pre-nominal adjectives should universally have scope over post-nominal adjectives. Furthermore, there is a question, barely touched upon above, of the proper treatment of adjectives interpreted non-restrictively. I will therefore adopt this analysis as the basis of my

account, but it will need to be modified to cover satisfactorily all the facts concerning adjective positions in Romance.

4.4   Extensions to the analysis

### 4.4.1   Wide-scope post-nominal adjectives

The preceding analysis has basically exhausted the hierarchies as they stood in chapter 3, motivating the observed pattern in French whereby the lower elements are found post-nominally and the higher elements pre-nominally. The remaining facts concerning wide-scope post-nominal adjectives cannot clearly be explained using these hierarchies. This suggests that the mechanics of the combination of such adjectives with the noun cannot be the same as those described in section 3.1, in other words that my JOIN operator cannot be responsible for the merger of these wide-scope post-nominal adjectives.

Instead, I propose to modify and expand upon the "attributive-predicative" position invoked in Cinque (1994). In Cinque's original proposal, with post-nominal orders derived by head movement rather than XP-movement, this was necessary to account for any cases of multiple post-nominal adjectives whose relative scope was a mirror image of that of pre-nominal adjectives. This was an unattractive proposal, because the post-nominal adjectives in (108–109) above, for example, show no special sign of any predicative interpretation. Now, however, the use of this predicative position will be much more restricted, to interpretations in which a rightward post-nominal adjective has scope over *pre*-nominal, as well as post-nominal adjectives. This more restrictive account of the attributive–predicative position is, I believe, justifiable. Recall that in section 4.2.3, discussing (110), I claimed that the reading with both post-nominal adjectives having wide scope was the least readily available. The construction also appears to be restricted to adjectives also available in copular constructions (Cinque 1994).

That there are (at least) two types of combination available for adjectives within the DP is shown by Sproat and Shih (1991). This paper gives details of adjective ordering facts in Mandarin Chinese, with and without the particle '-de' ('indirect' and 'direct' modification, respectively, in Sproat and Shih's terminology). This particle is also found in possessive and relative clause constructions, among others. Without '-de', basic adjective orders are rigid, as in English. With '-de', however, ordering is free. Adjectives with '-de' must also come further from the noun than adjectives

without '-de'. Sproat and Shih's proposed structures for the two positions are as follows:

(127) a. Direct modification:

N_y

A N_x

θ-role(s)
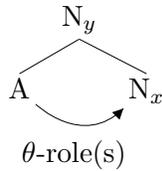
b. Indirect modification:

N_y

CP N_j^x

IP O_j

e_j A

θ-role(s)
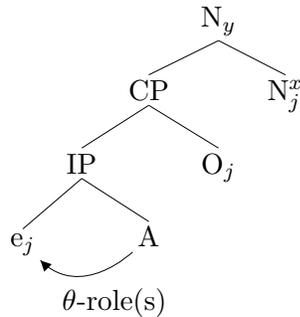
(Sproat and Shih 1991, p.567)

We should not necessarily adopt these structures, or the terminology attached to them, but the idea behind them represents a promising start, in that we have a distinct mode of combination corresponding to a high position in the tree, with overt morphological realisation in at least one language. In what follows, I will attempt to flesh out this account and adapt it to the French data.

The intuition behind Sproat and Shih's indirect modification structure is clear: the adjective modifies a null element which is coindexed with the main noun. For Sproat and Shih, building on the use of the same '-de' particle in Mandarin relative clauses, this null element is embedded within a relative clause structure, raising to [Spec,CP], paralleling the traditional relative clause analysis. This is, in fact, a case where an intersection-based analysis of adjectives seems genuinely appropriate, as the interpretation of indirect modifiers in Mandarin does not show scope effects, in Sproat and Shih's account, and the same appears to be true in cases of multiple French wide-scope post-nominal adjectives. I repeat Baker's (2003) intersective JOIN below:

(128) '$\lambda x^{\cup}(X' \cap Y')(x) = \lambda x \exists y [^{\cup}X'(y)$ & $^{\cup}Y'(x)$ & $\text{same}(Y)(x,y)]$' (Baker 2003, p.204)

What this essentially says is that there is some entity y which the adjectival property X is predicated of, while the nominal property Y is predicated of some

variable x, and that x and y are the same Y. While this may have been rejected above as a model of the semantics of direct modification, because of its reliance on intersection, the semantics are exactly parallel to the indirect modification structure in (127b). The operator O is playing the part of y, x is part of the main nominal semantics, X and Y are the same in both cases, and the coindexation is mediated, in Baker's conception, by the standard of sameness.

We may wonder, however, whether it is really necessary, or even desirable, to postulate a CP and IP layer above the adjective. One alternative, building on suggestions in Kayne (1994), Demonte (1999), Zamparelli (2000) and Alexiadou (2001), among others, is to propose a small clause structure in these cases. This would involve treating the adjective as a one-place predicate, and the noun as the specifier providing a value for the free variable in that predicate. This would explain the apparent terminological confusion in the "attributive-predicative" name: this construction is indistinguishable, at least in Western Romance, from standard attributive constructions in terms of overt word order: we find N–Adj order with regular attributive adjectives as well. However, the order is not derived from movement, as with narrow-scope post-nominal adjectives, but from the adjective being the sister of a nominal specifier in a predicative small clause construction, and so merged on the right of the nominal, assuming leftward specifiers.

The lambda-friendly version of Baker's JOIN which I will propose (let's call it JOIN$_{sc}$ for want of a better name) is as follows:
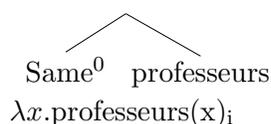
(129) JOIN$_{sc}$ = $\lambda A \lambda N \lambda x \exists y [A(y) \& N(x) \& \text{same}(N)(x,y)]$

This works much as standard JOIN above, selecting first an adjective, and then an NP, while providing the free variable assumed to be required for further computation. Furthermore, there is no need to worry about A and N being saturated by the "wrong" type of element (for example A cannot be saturated by an NP, and N cannot be saturated by an adjective), because the relation 'same', based, in Baker's formulation, on the standard of sameness, is only defined for nouns. If N is filled by anything other than a noun, same(N) will be undefined, and so JOIN$_{sc}$ will be undefined. On the other hand, if A is filled by a noun, either it will be a different noun to N, in which case same(N)(x,y) will be false, or it will be the same noun as N, in which case same(N)(x,y) may well be true, but the derivation should be ruled out trivially on informativeness grounds: merger of a second copy of the noun phrase and JOIN$_{sc}$ would contribute nothing new semantically.
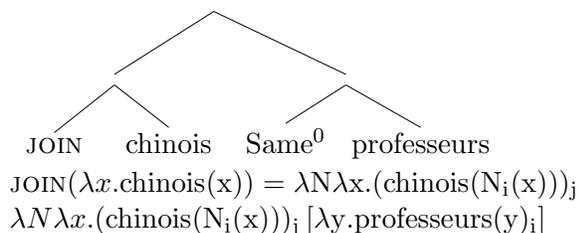
This formulation of JOIN$_{sc}$ is set up to merge directly with an adjective as a complement, rather than keeping Sproat and Shih's null operator movement-based account. However, JOIN$_{sc}$ occurs higher in the tree than standard JOIN. Intuitively, this can be assimilated to the wider case of relative clauses, which also only occur high in the DP[60]. As a tentative suggestion for a deeper explanation, though, note that we are assuming that lower instances of JOIN modify a nominal property which is not "closed off". Note that the above formulation of JOIN$_{sc}$, unlike standard JOIN, does not update the standard of sameness of the noun which it selects. It uses the standard of sameness as a means of identifying the two variables, x and y, with respect to some nominal property, but it doesn't actually modify that standard of sameness itself. I take this to be related to JOIN$_{sc}$ only being available above Ref^0, the level at which the standard of sameness has been fixed by merger of Ref^0. There is clearly nothing in the semantics of JOIN$_{sc}$ which precludes merger above Ref^0 (unlike standard JOIN), and so the higher position for JOIN$_{sc}$ should indeed be available. Furthermore, it is conceivable that the relation 'Same' is only available above Ref^0: a major function of this relation, in Baker (2003), is to allow tracking of referents through the discourse, and Ref^0 could be seen as the level essential to that function, given its role in forming Kinds, following Carlson (1977) and Zamparelli (2000). If this is the case, JOIN$_{SC}$ is restricted to above Ref^0.

In this case, the reading of Bouchard's 'Les présumés professeurs chinois mal-honnêtes' with wide scope 'malhonnêtes' and narrow scope 'chinois', for example, would be derived as follows:

(130) a. Merge of Same^0 with 'professeurs':

        Same^0 professeurs
     $\lambda x.\text{professeurs(x)}_i$

    b. Merge of 'chinois' and standard JOIN:

       JOIN   chinois Same^0 professeurs
      $\text{JOIN}(\lambda x.\text{chinois(x)}) = \lambda N\lambda x.(\text{chinois}(N_i(x)))_j$
      $\lambda N\lambda x.(\text{chinois}(N_i(x)))_j\,[\lambda y.\text{professeurs(y)}_i]$

---

[60]The semantic similarities of the two should be clear, not least from the early transformational attempts to derive adjectives from relative clauses, for example Vendler (1968).
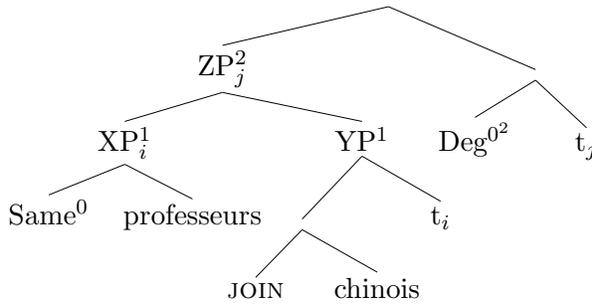
$$= \lambda x.(\text{chinois} \, (\lambda y.\text{professeurs}(y)_i[x]))_j$$
$$= \lambda x.(\text{chinois} \, (\text{professeurs}(x)_i))_j$$

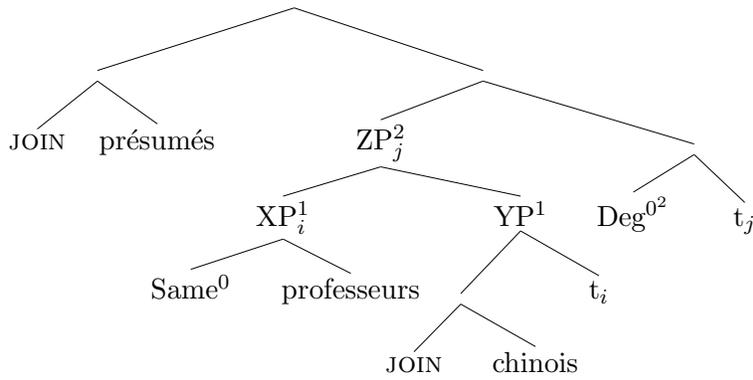c. Movement of Same^0 and 'professeurs' past JOIN and 'chinois':
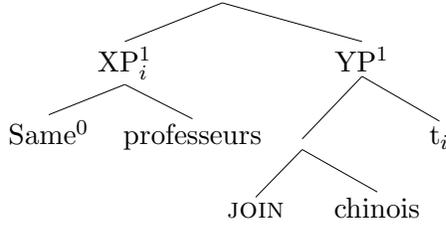
Feature-driven movement: superscript '1' represents feature-checking configuration.

d. Merge of Deg^0, and movement of its sister into checking configuration:

Feature-driven movement, as above.

e. Merge of 'présumés' with JOIN:

$$\text{JOIN}(\lambda x.\text{présumés}(x)) = \lambda N \lambda x.(\text{présumés}(N_i(x)))_k$$
$$\lambda N \lambda x.(\text{présumés}(N_i(x)))_k \, [\lambda y.(\text{chinois} \, (\text{professeurs}(y)_i))_j]$$
$$= \lambda x.(\text{présumés} \, (\lambda y.(\text{chinois} \, (\text{professeurs}(y)_i))_j[x]))_k$$
$$= \lambda x.(\text{présumés} \, (\text{chinois} \, (\text{professeurs}(x)_i)_j))_k$$

f. Merger of Ref^0, followed by JOIN_{SC} with wide-scope 'malhonnêtes':
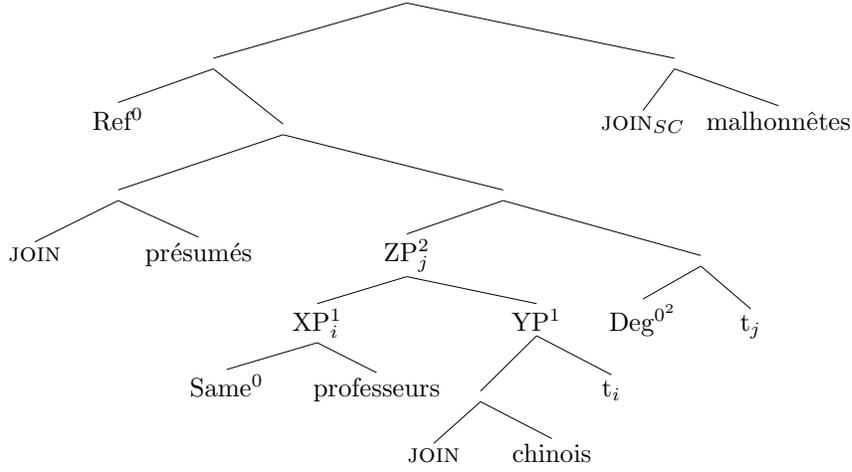
$$\text{JOIN}_{SC}(\lambda x.\text{malhonnêtes}(x)) = \lambda N \lambda x \exists y(\text{malhonnêtes}(y) \,\&\, N(x) \,\&\, \text{same}(N)(x, y))$$

$$\lambda N \lambda x \exists y(\text{malhonnêtes}(y) \,\&\, N(x) \,\&\, \text{same}(N)(x, y)) \, [\lambda z.(\text{présumés}\,(\text{chinois}\,(\text{professeurs}(z)_i)_j))_{k,l}]$$

$$= \lambda x \exists y(\text{malhonnêtes}(y) \,\&\, \lambda z.(\text{présumés}\,(\text{chinois}\,(\text{professeurs}(z)_i)_j))_{k,l}[x]$$

$$\&\, \text{same}(\lambda z.(\text{présumés}\,(\text{chinois}\,(\text{professeurs}(z)_i)_j))_{k,l})(x, y))$$

$$= \lambda x \exists y[\text{malhonnêtes}(y) \,\&\, \text{présumés}\,(\text{chinois}\,(\text{professeurs}(x)_i)_j)_{k,l}$$

$$\&\, \text{same}(\lambda z.(\text{présumés}\,(\text{chinois}\,(\text{professeurs}(z)_i)_j))_{k,l})(x, y)]$$

We can now accommodate wide-scope post-nominal adjectives within our DP structure, with a distinct semantics from the usual attributive adjective semantics. Furthermore, we can explain the distinct interpretations of subsective and modal adjectives in post-nominal positions: these adjectives are no longer dynamically updating the property denoted by their sister, but rather are being used predicatively, and so with a more absolute interpretation. In section 2.3, it was noted that one consequence of the representation of standard attributive adjectives advocated here was that the inference from $(\text{Adj}(N(x)))$ to $\text{Adj}(x)$ and $N(x)$ was not automatic. From the semantics of JOIN_{sc}, however, we can indeed automatically deduce the two conjuncts $\text{Adj}(y)$ and $N(x)$. This explains the (possibly coerced) non-modal interpretation of normally modal adjectives, and the more absolute, or "intersective", interpretation of normally subsective adjectives.

I still believe that wide-scope readings are relatively rare or awkward in French, although I do not doubt that they exist. This is probably unsurprising, given the minimal effect of scope on interpretation in many cases, competition from the availability of the pre-nominal wide-scope adjective position, and the fact that the two JOINs will give similar interpretations in several cases.

Overall, the system being developed is one which has a large amount of machinery available, and this machinery often only produces subtle differences in the overall

interpretation. I believe this is, in fact, a desirable result, given that we find in
Romance a set of languages and dialects which exhibit by and large similar patterns
with respect to adjective ordering, but which may or may not display individual
preferences for pre- or post-nominal position of regular adjectives. It seems that
adjectives in Walloon are almost invariably pre-nominal, while adjectives in Sardinian
are generally post-nominal, with other Romance varieties situated between these two
extremes (examples from Bernstein 1993, pp.25–6):

(131) a. Walloon:
      'On neûr tchapė'
      'A   black hat'
      cf. French 'Un chapeau noir'.

   b. Walloon:
      'Du l'   corante ėwe'
      'Of the running water'
      'Running water'
      cf. French 'De l' eau courante'.

   c. Sardinian (Campidanese):
      'Una dí   trista'
      'A   day sad'
      'A sad day'
      cf. Italian 'Una trista giornata'.

   d. Sardinian (Campidanese):
      'Tempus malu est faendi'
      'Weather bad   it-is making'
      'The weather is bad'
      cf. Italian 'Sta facendo mal tempo'.

The system developed in this thesis does not rule out very many orders (although
it does make predictions concerning scope among multiple adjectives), given the
interaction of the focus position, the construction with JOIN_{sc}, and the availability
of roll-up movement, but it does predict which are the usual orders and the usual
interpretations in French, and the system should be readily adaptable to make similar
predictions for related adjective ordering facts in other languages.

We may ask, for example, whether there is any evidence for the availability of
JOIN_{sc} in English. I believe that there is, and that this is the construction which
allows post-nominal adjectives (generally, although not always, with complements)
in English. The structure and interpretation of a phrase such as 'The members
present' would then be as follows:

(132)

The x.$\exists$y.[present(y) & members(x)$_{i,r,l}$ & same(members$_{i,r,l}$)(x,y)]
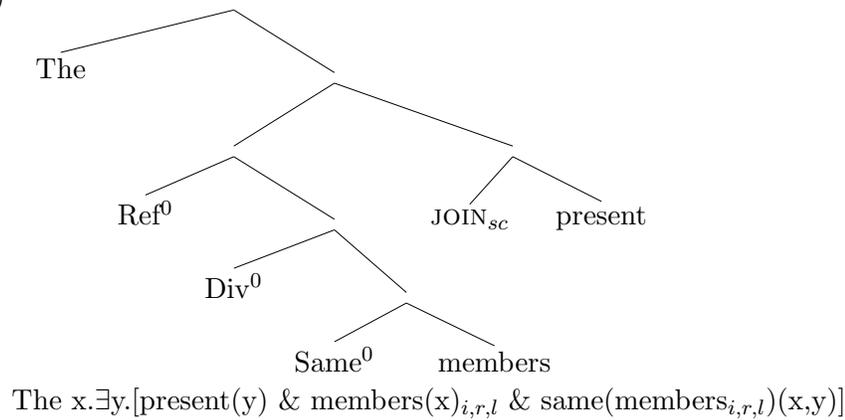
This predicts that post-nominal adjectives in English always should have wide scope (except perhaps over focused pre-nominal adjectives), a prediction which remains to be verified, but it seems plausible that the adjective interpretations available in this position correspond to a substantial degree to wide-scope post-nominal adjectives in French.

One issue which should be addressed concerns the rarity of post-nominal adjectives (other than adjectives with complements) in English. If we can indeed claim that regular, pre-nominal, attributive adjectives are heads taking nominal complements, the restriction of adjectives with PP complements, for example, to post-nominal position would be motivated. As for other cases, it appears that post-nominal adjectives without complements are not necessarily prohibited, so much as extremely rare. A search of the Brown corpus revealed 136 examples of post-nominal adjectives, other than adjectives with complements, or roughly one token for every 7,400 words. These could be broken down as follows:

(133) a. Predicated of an anaphoric possessive DP: 28 tokens. e.g.:
           'She took it grudgingly, her dark eyes baleful.'

       b. As part of a job title: 55 tokens. e.g.:
           'The Ukrainian poet laureate', 'The Attorney General', 'President Emeritus Hopkins'.

       c. In a predicative copular construction with expletive 'there': 2 tokens, e.g.:
           'There never were two fames alike.'

       d. Predicated of a 'Q of them' DP: 2 tokens, e.g.:
           'Other possibilities, none of them satisfactory'.

       e. Post-N Adj is 'available': 16 tokens, e.g.:
           'The resources available'.

 f. Post-N Adj is 'possible': 6 tokens, e.g.:
  'The best equipment possible'.

 g. Post-N Adj is 'proper': 2 tokens, e.g.:
  'The college proper'.

 h. Post-N Adj is 'discernible': 2 tokens, e.g.:
  'The continuities, contrasts and similarities discernible'.

 i. Phrase 'The life eternal (through Christ)': 2 tokens.

 j. Other Post-N Adj (only 1 token of each): 21 tokens.

This shows that, outside of the two parenthetical constructions (133a) and (133d), the presumably frozen job titles and the copular construction, there are very few adjectives which appear regularly in this position[61]. Certainly, the claim (of e.g. Larson 1999, Cinque 2003, with its origin probably in Bolinger 1967) that only Stage Level interpretations are available post-nominally receives strong support, although certain adjectives seem incompatible with this view ('life eternal', 'time immemorial', for example[62]). The pattern holds to a very large extent, however. Larson builds an explanation of this restriction on a theory of SL adjective interpretations being outside the scope of a generic quantifier over event variables. This is clearly compatible with the predicative structure high in the DP argued for in this section, although I am unaware if the same restriction carries over to the predicative construction in French and other languages.

It seems, in this case, that we can claim that adjectives are generally available in post-nominal position, but only in one of a few constructions, or with a SL interpretation, which is further favoured if the adjective is clearly ambiguous, as in pre-N versus post-N 'present'.

4.4.2 A note on non-restrictive interpretations

Cinque (2003) claims that there is a distinction between restrictive and non-restrictive interpretations of adjectives which is also related to the position in which the adjective is merged, and which can be accommodated within a roll-up movement-style analysis. This is made on the basis of the following data:

(134) a. 'All of his **unsuitable** acts were condemned.' (*ambiguous*)

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[61]To 'available' and 'possible', we may add, for example, 'present', 'due', and 'pending', which are surprisingly under-represented in the Brown corpus.

[62]It is possible that these could be regarded as fixed expressions. There are other minor exceptions: archaic 'printed symbol swart', fixed 'body beautiful' and 'body politic', and adjectives such as 'alone' and 'proper' with a quite different function.

b. 'All of his acts were condemned; they were unsuitable.' (*non-restrictive*)

c. 'All of his acts that were unsuitable were condemned.' (*restrictive*)

(135) a. 'Every word **unsuitable** was deleted.' (*unambiguous*)

b. # 'Every word was deleted; they were unsuitable.' (*non-restrictive*)

c. 'Every word that was unsuitable was deleted.' (*restrictive*)

(136) a. 'Le **noiose** lezione di Ferri se le ricordano tutti.' (*unambiguous*)

b. 'Everyone remembers F's classes, all of which were boring.' (*non-restrictive*)

c. # 'Everyone remembers just F's classes which were boring.' (*restrictive*)

(137) a. 'Le lezione **noiose** di Ferri se le ricordano tutti.' (*ambiguous*)

b. 'Everyone remembers F's classes, all of which were boring.' (*non-restrictive*)

c. 'Everyone remembers just F's classes which were boring.' (*restrictive*)
   (All from Cinque 2003, p.2)

(138) Restrictive > Non-restrictive N
   'His MOST UNSUITABLE unsuitable acts'(=His unsuitable acts MOST UN-
   SUITABLE) (*'His unsuitable MOST UNSUITABLE acts')

(139) N non-restrictive > restrictive
   'I (nostri) Greci industriosi PIU' ATTIVI' (...*'PIU' ATTIVI industriosi')

On the basis of this data (and data relating to other such ordering facts), Cinque proposes an analysis based on a dual source of adjectives, with roll-up movement past the one, but not the other, in Romance.

Such an analysis, if adopted, would raise the question of how a positional account of non-restrictive interpretations interacted with the, largely positional, account of other interpretations above. However, I believe that Cinque's data do not accurately represent the ordering facts concerning non-restrictive interpretations.

Firstly, Cinque predicts that, for English pre-nominal adjectives, a restrictive adjective is found further from the noun than a non-restrictive adjective. This is, however, only based on his one example using superlative 'most', and counter-examples without 'most' are not hard to come by:

(140) a. 'Tasty organic carrots'

b. 'The astonishing Egyptian pyramids'

In neither of these is the first adjective interpreted restrictively: 'Tasty organic carrots' are not compared to tasteless organic carrots, but are instead interpreted most naturally as being tasty by virtue of their organicness. And it is inconceivable that one could claim that 'astonishing' distinguishes certain Egyptian pyramids from their more mundane counterparts — it is a subjective comment on 'Egyptian pyramids' which does not alter the denotation of that expression at all.

Secondly, Cinque lists a pre-nominal Italian adjective as unambiguously non-restrictive. This may be accurate for adjectives which are canonically found post-nominally, but the list of French primary adjectives[63] generally found pre-nominally clearly have restrictive interpretations, and so don't fit this pattern:

(141) a. 'Un bon   garçon'
           'A   good boy'

       b. 'Un grand bâtiment'
           'A   big   building'

In either of these cases, the Adj–N sequence denotes a proper subset of the denotation of the noun. We are, then, dealing with a restrictive pre-nominal adjective, unexpectedly under Cinque's proposals[64].

As for Cinque's perception of N > non-restrictive > restrictive order in Romance post-nominal adjectives (as well as the reverse in English), I would claim that superlatives and comparatives are not reliable indicators of standard order holding among these elements, given the new combinatorial options proposed in section 4.4.1. It is clear that the structure of the AdjP can affect its position in the DP and scope relations with other adjectives, so I am reluctant to base much on this evidence alone.

Indeed, there is a group of papers, including Demonte (1999) and Gutiérrez-Rexach and Mallen (2001, 2002) which assume that, in Spanish, a qualitative non-restrictive interpretation is only possible in pre-nominal position. I believe this is a more accurate description of the facts in general. However, I will diverge from these papers in that it is clear that restrictive interpretations of the "subsective" class of qualitative adjectives are available pre-nominally and, following (140) above, it appears that the non-restrictive interpretation is found further from the noun than the restrictive interpretation. This is undoubtedly a simplification of sorts, in that example (69) in section 3.2, concerning 'a JET BLACK big car', comes very close

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[63]I believe that the examples translate straightforwardly into Italian.

[64]The same is also true of some, but not all, pre-nominal focused adjectives. Modal adjectives do not clearly fit into the restrictive / non-restrictive distinction.

to a restrictive interpretation of 'JET BLACK' and a non-restrictive interpretation of 'big car'. However, this is more accurately considered, along the lines suggested in section 3.2, as presupposition of the kind 'big car' and reference to a subkind 'jet black big car'.

I propose that a focus-based explanation is also available for other non-restrictive interpretations. Essentially, I believe that non-restrictive interpretations of adjectives arise from focus–presupposition semantics as described in section 3.2, but with the difference that the subkind which saturates the free position in Zamparelli's KSK operator is non-proper. I will explain why I believe this to be a viable option.

Firstly, note that what distinguishes a non-restrictive interpretation is the *presupposition* that the property denoted by the adjective already forms part of the intension of the nominal. Indeed, there would appear to be strong links between non-restrictive adjective interpretation and presupposition: for instance, assuming the now standard view of definiteness as related to presupposition (see Beaver 1997 and references therein), it is much easier to get a non-restrictive reading of an adjective dominated by a definite determiner than otherwise: if we take the two classic French examples of non-restrictive adjectives and substitute indefinite articles, either the non-restrictive interpretation disappears or the phrase becomes much more awkward:

(142) a. 'Ma verte prairie'
         'My green meadow'
         (Non-restrictive interpretation is most salient.)

      b. 'Une (très) verte prairie'
         'A   (very) green meadow'
         (Contrastive focus interpretation is most salient.)

(143) a. 'Ce   plat pays'
         'This flat country'
         (Non-restrictive interpretation is most salient.)

      b. 'De   ?(très) plat pays'
         'Some (very) flat countries'
         '(Very) flat countries'
         (Restrictive interpretation is most salient.)

This suggests strongly that the referent of a DP containing a non-restrictive adjective is presupposed to be present in the discourse context. In that case, we should ask exactly what the function of the non-restrictive interpretation *is*. The

presupposition is that the attribution of the property denoted by the non-restrictive adjective to the nominal it modifies is already in the common ground. However, it is not generally explicit prior to this point[65]. The function of the non-restrictive adjective is to draw attention to a property presupposed to be tacitly present in the intension of a DP presupposed to be in the common ground.

I repeat Zamparelli's KSK operator from example (71):

(145) **KSK**$(\| \textbf{KIP} \|^{M,g,w}) = \lambda x^k \forall z \Box[\textbf{R}(z,x) \rightarrow \textbf{R}(z, \| \textbf{KIP} \|^{M,g,w})]$ (Zamparelli 2000, p.175), where:
$\| \text{KIP} \|$ is the denotation of KIP (equivalent to my RefP);
R is the 'realisation relation' through which stages realise individuals (objects or kinds).

This trivially admits the case where x^k is unified with $\| \text{KIP} \|^{M,g,w}$ as follows:

(146) $\lambda x^k \forall z \Box[\textbf{R}(z,x) \rightarrow \textbf{R}(z, \| \text{KIP} \|^{M,g,w})][\| \text{KIP} \|^{M,g,w}]$
$= \forall z \Box[\textbf{R}(z, \| \text{KIP} \|^{M,g,w}) \rightarrow \textbf{R}(z, \| \text{KIP} \|^{M,g,w})]$
$= 1$

So the adoption of Zamparelli's KSK operator as a model of adjectival focus also gives a way of explaining non-restrictive interpretations of pre-nominal adjectives in English and French. The nominal which the non-restrictive adjective modifies is presupposed to be in the common ground, and the non-restrictive interpretation arises because the subkind denoted by the Adj$_{non-restrictive}$–N group is a non-proper subkind of the kind denoted by the nominal alone. We therefore interpret such an adjective as focusing on a property already presupposed to be in the intension of the nominal.

Some evidence is available to corroborate this suggestion. Recall from section 3.2 that KSK is incompatible with modal adjectives, because the fact that an entity z realises the kind denoted by an Adj$_{modal}$–N group does not entail that it realises the kind denoted by the noun alone. Now, if it is possible to claim that 'very' or 'très' may, in certain cases, mark a focused adjective, we can explain the observation (due

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[65]This needs to be qualified to take account of the anaphoric pattern noted by Waugh (1977) and Goes (1999), where a DP referring anaphorically to an earlier DP could have Adj–N order, regardless of whether the original order was Adj–N or N–Adj. This gives patterns like the following:

(144) 'J' ai   vu   un *éléphant énorme*   ... Cet *énorme   éléphant* buvait de l'   eau.'
'I   have seen an elephant enormous ... This enormous elephant drank of the water.'
'I saw an enormous elephant ... This enormous elephant was drinking water.'
(Example from Waugh (1977).)

However, the second occurrence of adjective here is clearly optional, and its presence is probably motivated more by stylistic than grammatical factors.

to Goes 1999) that a pre-nominal adjective with 'très' is generally interpreted in the same way as that adjective is interpreted postnominally. This pattern is illustrated in (147) (see also fn.47):

(147) a. 'Une église   ancienne'
             'A   church old'
             'An old church'

       b. 'Une ancienne église'
             'A   old   church'
             'A former church'

       c. 'Une très ancienne église
             'A   very old   church'
             'A very old church' ≠ 'A very former church'

             (See footnote ^{66}.)

If the AdjP in (147c) is indeed in a focus position, then the semantics of KSK would entail that only the non-modal, post-nominal reading is available. This is exactly what we find.

If we then construct a discourse to allow 'très ancienne église' with a definite determiner, then a non-restrictive reading is available, again with the non-modal interpretation:

(148) 'J' ai   visité l'   abbaye de Gellone à St Guilhem le Désert.'
       'I   have visited the abbey of G.   at St. G.   le D.'

       'Cette *très ancienne église* m' a   beaucoup ému.'
       'This   very old   church me has very-much moved.'

       'I visited the abbey of Gellone at St Guilhem le Desert.
       This *very old church*(≠ church from the distant past) greatly moved me.'

Gutiérrez-Rexach and Mallen (2001, 2002) indicate that a non-restrictive reading is also available post-nominally, if separated from the rest of the DP by comma intonation, as in (149)[67]:

(149) 'La   carrera, accidentada, fue suspendida.'
       'The race,   calamitous,   was suspended.'
       'The race, which was calamitous, was suspended.' (Gutiérrez-Rexach and
       Mallen 2001, p.118)

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[66]It is conceivable that this could have meant, for example, something which was a church in the distant past, rather than the recent past.

[67]Note that this is also possible in English, a possibility not discussed in Cinque (2003): in the sentence 'Every word, unsuitable, was deleted' (*cf.* (135a)), the adjective is only interpretable non-restrictively.

This strongly recalls Sproat and Shih's (1991) suggestion that a distinction between restrictive and non-restrictive interpretations of adjectives in their indirect modification configuration is due to a distinction between merger below or above Det, respectively[68]. Sproat and Shih's examples and interpretations (from Mandarin) are as follows:

(150) a. 'Hóng- de zhèiběn shū   zài zhuōzi shàng'
        'Red   DE this   book at table   on'
        'This red book is on the table' [Non-restrictive]
        [this x | book′(x)]$_j$ is on the table & it$_j$ is red

   b. 'Zhèiběn hóng- de shū   zài zhuōzi shàng'
       'This   red   DE book at table   on'
       [this x | (red′(x) & book′(x))] is on the table

In these examples, we see that a variation in the relative order of the determiner and the adjective with '-de' corresponds to an interpretation of the adjective as part of the restriction in (150b), and as an additional predicate in (150a). In light of the above discussion, we should perhaps instead interpret the adjective in (150a) as a presupposition. However, the correspondence between difference in order and difference in interpretation is clear. In examples such as (149), this is complicated by the fact that the determiner and the non-restrictive adjective are on opposite sides of the noun, and so it is less easy to determine relative scope, but in light of the comma intonation in that example, it seems plausible that the non-restrictive adjective may be outside the scope of D, and that this is the cause of the non-restrictive interpretation.

So it seems likely that a non-restrictive interpretation of post-nominal indirect adjectives in French[69] can be linked to a higher position for the merger of adjectives in the structure described in section 4.4.1.

This concludes the exposition of the additional structures necessary to give a reasonable degree of empirical coverage concerning French adjective order and interpretation. Of course, this chapter is a long way from explaining many French adjective orders, but it strongly suggests that the structures argued for in this thesis are capable of providing a framework for such explanations.

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[68]A similar suggestion is made in Kayne (1994), to the effect that non-restrictive interpretation is due to scope over D.

[69]And Spanish, as in the example from Gutiérrez-Rexach and Mallen (2001). I have no proposal for the different linear orders of indirect modifiers evident in Mandarin and Romance.

Chapter 5
Conclusion

This thesis identified several properties of attributive adjectives that were in need of explanation: merging an attributive adjective is optional; attributive adjectives may be merged recursively; relative adjective order is not entirely rigid, but does generally show subsective > intersective order; and interpretation of multiple attributive adjectives is subject to scope effects. Furthermore, the existence of semantic differences between pre- and post-nominal adjectives in French had to be explained, along with non-restrictive and attributive-predicative interpretations.

To explain these phenomena, three types of attributive adjective construction in the English and French DP were described: regular attributive adjectives behaved like heads; an analysis of adjectival focus as movement to a specifier position was proposed; and the small clause analysis of the "attributive-predicative" position was adopted, making the adjective in this case the sister of a nominal specifier. Following Gutiérrez-Rexach and Mallen (2001, 2002) and Cinque (2003), a roll-up movement analysis of the differences between French and English adjective positions was proposed, in the absence of any clear semantic distinction between regular attributive adjectives in the two languages.

Alongside these different syntactic structures, various non-syntactic factors were shown to constrain possible orders of regular attributive adjectives. This supported the proposal in Ernst (2002) of distinct syntactic and semantic / selectional hierarchies, loosely parallel to each other but free to diverge to a certain extent, and this proposal was further strengthened by the demonstration that restrictions on adjective orders cannot be explained solely on the basis of the functional sequence assumed to regulate nominal semantics and morphology. Treatments of scope ambiguities between French pre- and post-nominal adjectives, and of non-restrictive interpretations of attributive adjectives, were also proposed.

This thesis offers little more than a sketch of all the issues at stake. As a next step, the appendix offers a sketch of a theory of phrase structure which excludes the category "adjunct", but provides a principled basis for assimilating adjuncts (intuitively recognisable as the optional elements in a structure) to the more central classes of specifiers, heads and complements. Clearly, much further work remains to be done in testing the empirical coverage of this sketch against other types of adjunct and broader comparative data.

Overall, though, the hope has been to show that it is plausible that a careful consideration of the data, and of the structure of DP and attributive adjectives, significantly reduces the amount of mystery in adjective orders. The general conclusion from this paper should then be that there is relatively little exceptional about attributive adjectives, and that accounts which postulate large amounts of partic-
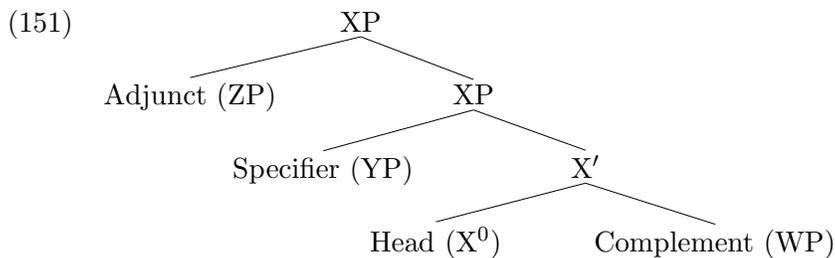
ular syntactic structures to account for adjective ordering facts are unlikely to be empirically or theoretically adequate.

Appendix
Adjuncts and phrase structure

It was claimed in section 3.1 that regular attributive adjectives could plausibly be treated syntactically as heads, but this claim was left largely unsupported there. Two major problems were noted, firstly that AdjPs intervening in the sequence of functional heads complicated the complement-selection mechanism, and secondly that regular attributive adjectives were often syntactically complex, involving degree markers such as 'very'. I would like here to present a sketch of a way of resolving these issues, by appealing to definitions of "head", "specifier" and "complement" in terms of their combinatorial function, rather than their structural relationships to each other.

A standard, 80s-model, conception of X′ phrase structure might give the following regular model of the structure of a phrase in an SVO language:

(151)

```
                        XP
            _____/  _____
        Adjunct (ZP)            XP
                       _____/  _____
                   Specifier (YP)         X′
                                    _____/  _____
                                Head (X⁰)     Complement (WP)
```

While the Spec–head order and the head–complement order were parameters in UG to be fixed for a given language, and every element (except the adjunct) was obligatory in every XP, the labels "head", "specifier" and "complement" were likely to be defined predominantly in structural terms: the sister of a head was a complement, the sister of X′ was a specifier, complements and specifiers were phrasal, heads weren't, and so on.

With Chomsky (1995), and the shift to the Minimalist Program, the theory of Bare Phrase Structure was proposed, in which bar-levels, and other structural labels which had been relevant in X′ phrase structure theory, no longer had any theoretical status, as they weren't projected from the lexicon. I repeat Chomsky's proposed structure of a derived syntactic object in this new theory:

(152) 'K$=\{\gamma, \{\alpha, \beta\}\}$, where α, β are objects and γ is the label of K' (Chomsky 1995, p.243)

Here, γ, the label of the derived syntactic object, is taken to be equal to one of

α or β, the two sisters. In that case, there is an asymmetry between the two sisters, in that one projects, becoming the label for the derived syntactic object as a whole.

This proposal attracted criticism in some parts. For example, following Koster (2000), it is not clear what should force the label of the derived object to be identical to the label of one of the daughters. Furthermore, the strong minimalist position would be that the label of a derived syntactic object is uniquely determined for a given pair of sisters, and so could be omitted from the representation of the derived syntactic object, which could then be represented as K=$\{\alpha, \beta\}$. This is along the lines suggested in Chomsky (1998). Here, the label is deemed to be redundant, but there are still two types of derived syntactic object: the set $\{\alpha, \beta\}$ formed by substitution, and the ordered pair $\langle\alpha, \beta\rangle$ formed by adjunction (Chomsky 1998, pp.23–5). This is still arguably not the ideal situation, from a minimalist point of view. Chomsky claims that the distinction is necessary because 'Adjunction has an inherent asymmetry: X is adjoined to Y' (Chomsky 1998, p.23). However, he goes on to show that substitution also has 'an inherent asymmetry. When A, B merge, it is to satisfy requirements of one of them (say, A); its label projects' (Chomsky 1998, p.24). In this case, it is far from clear what should motivate the representation of one type of derived object as an unordered pair, and the other as an ordered pair: in each case, there is an inherent asymmetry between the two daughters.

We are tantalisingly close here to the most minimal conceivable derived syntactic object: the set consisting of two sisters. As the only sticking point is the status of adjuncts in phrase structure, adjectives, and attributive adjectives in particular, constitute a critical testing ground. This is especially the case because attributive adjectives have been assigned to almost every conceivable structural category in, admittedly anachronistic, X$'$ terms: for Abney (1987), they are heads selecting NP complements; for Cinque (1994), they are specifiers in a functional sequence; for Kayne (1994), they are the sisters of specifiers in predicative constructions; for Bernstein (1993), for Alexiadou (2001), and for me, a hybrid analysis is necessary.

By now, however, we are far from a structural definition of "specifier", "head" and "complement". Head movement can create structurally complex heads, while Bare Phrase Structure allows a node to be simultaneously minimal and maximal, so giving structurally non-complex XPs. Furthermore, these labels have no special status in minimalist theory, although they are almost universally used as a convenient, and usually relatively unambiguous, shorthand. The hope in this appendix is to sketch

the basis for a conception of the distinctions between these classes in terms of their function and their relationship with their sister. Such an endeavour, fully realised, would put the terms on a more solid grounding within modern theory, while still preserving the insights from Bare Phrase Structure. In doing so, I hope to argue that the category "adjunct" can be excluded[70], and that the last non-minimal element can therefore be removed from the structure of the derived syntactic object.

As a starting point, let's take the comment in Chomsky (1998) that 'When A, B merge, it is to satisfy requirements of one of them (say, A); its label projects' (Chomsky 1998, p.24). Within the minimalist framework, the clearest way to understand 'requirements' is in terms of feature checking, for specifiers, and in terms of complement-selection, for complements. A head merges with an appropriate complement, and uninterpretable features require that an element be either Merged or Attracted to a specifier position. In this case, it is important, following Chomsky (1995), to distinguish between semantically interpretable features, and uninterpretable features: Chomsky notes the 'special role of the property of displacement of categories that is characteristic of human language: the sole function of [uninterpretable features] is to force movement, sometimes overtly' (Chomsky 1995, p.278). It is important, in this case, to recognise that the feature-checking "specifier" position in fact covers two distinct operations, one of which has an effect on the compositional semantics of an utterance, the other of which is concerned instead with inducing movement. I will initially concentrate on the cases of phrases Merged in specifier position, rather than moved there, as the issue of movement is quite separate, and less clearly manifested within the English and French noun phrase.

Turning to the head–complement relationship, I believe that it is important to dissociate oneself clearly from the notion, a hangover from pre-minimalist X′ formalisms, of the head as somehow "central" to a phrase. In a truly bare conception of phrase structure, there is nothing syntactically different between merging a head as sister to a complement, and merging a specifier with its sister, except in terms of projection (to which I return below).

Note, next, that the conception of heads in Borer (2001), and adopted in section 2.5 suggests, implicitly, an interesting *semantic* correlate of the syntactic notion of projection. In Borer's structure, a functional head is associated with a free variable[71],

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[70]At least as far as XP-adjunction is concerned. Head-adjunction is too thorny an issue, and too far removed, to address here.

[71]We may also wish to consider the possibility that a functional head could add an index to the

and one major way of assigning range to that variable is through Spec–head agreement. In terms closer to Categorial Grammar, then, we could claim that heads are functors, taking the complements as arguments and outputting a derived syntactic object with the semantics of the complement, plus an extra free variable or index. On the other hand, phrases initially Merged in specifier position represent arguments to the function denoted by their sister[72].

This is clearly not enough to distinguish specifiers, heads and complements: we have described two relationships, but each consists of a functor and an argument: heads, and the sisters of specifiers, are functors; specifiers and complements are arguments. Nothing yet tells us, then, whether a given relationship is head–complement or Spec–sister. To address this issue, consider some of the canonical instances of elements Merged in specifier positions. The list is quite short: subjects in [Spec, v] and in small clauses, perhaps objects in [Spec, V], perhaps genitive DPs in [Spec, D], and possibly topics in [Spec, Top], if we follow Rizzi (1997).

A generalisation suggests itself: canonical examples of elements initially merged in specifier positions are primarily realised by the types of phrase we see functioning as arguments to verbal predicates[73]. As a rough approximation, we could suggest that the specifier forms a different Extended Projection to the element it merges with. Any other case of initial merge will be an instance of the head–complement relationship, the next step in the derivation, within the same extended projection as the complement. Meanwhile, any other element in specifier position will be moved there for checking of uninterpretable features. This can be seen, intuitively, as a process by which more complete syntactic units are formed out of less complete units, and ultimately out of lexical roots (by Merging heads), while cases of Merge in specifier position are cases of using this complete, "closed off", syntactic unit, as an argument to a larger, and distinct, syntactic structure (for example, using a DP as a sentential argument).

This is only a very rough sketch of these possibilities: there has been much more rigorous investigation along similar lines, although for quite distinct reasons, in Chomsky (1999) and Grimshaw (2003), among many others. I will assume, in what

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semantics of its sister, as suggested for Same[0] and Ref[0] in section 2.4.

[72]Recall that phrases Attracted to specifier positions are Attracted by uninterpretable features, under the mechanism proposed in Chomsky (1998), and so cannot be accounted for in this way.

[73]This may conceivably need to be modified to allow PPs and IPs too. Again, a formulation in terms of Extended Projections (Grimshaw 2003) seems feasible, as D and P, and I and C, form part of the same extended projection.

follows, that some more robust distinction along these lines is possible between elements merged in specifier positions, and elements in head–complement relationships.

The next obvious question is: why is it worthwhile to derive these labels in this way, given their removal in Bare Phrase Structure? The reason for this is concerned with linear ordering of constituents, rather than the set-based, unordered, hierarchical structure which is generally considered (by e.g. Chomsky 1995, Bouchard 2002) to be a more "core" component of syntax. Since the early days of the Principles and Parameters model, a major way of stating linear orders of constituents has been in terms of the relative orders of specifiers, heads and complements, and this is still evident to some extent today: the Linear Correspondence Axiom of Kayne (1994) derives universal Spec–Head–Complement order, for example, while the C-Dir and F-Dir of Ernst (2002) derive universal Spec–Head order, and a head-initial / head-final parameter. Within the approach described above, it is clear that there is no correlation between functor–dependent relationships and linear order: in a language such as English, specifiers, which are dependents, precede their functor sisters, while heads, which are functors, precede complements, which are dependents. However, if the hoped-for possibility of distinguishing specifiers from other dependents materialises, it remains possible to state a description of the linear orders in terms of specifier, head and complement order.

The major consequence of this approach, from the point of view of attributive adjectives, is that there is no clear place in the typology of functor–dependent relationships for an adjunct–sister relationship. The assumption within the Chomskyan tradition has always been that, when an adjunct is merged, its sister projects, and is syntactically the head. The classic generative account therefore has two problems: firstly, there is a possibly unwarranted division of the class of attributive adjectives into the non-modal adjectives, which generativists generally analyse along the lines suggested by Higginbotham (1985), in terms of θ-identification and autonymous θ-marking, and the modal adjectives, which are analysed as functors taking nominal arguments. Secondly, in the case of modal adjectives, the standard generative treatment leads to an unfortunate split between syntactic and semantic headedness. Semantically, the adjective is the functor, and so would normally be analysed as the head. Syntactically, the nominal projects, and so would normally be analysed as the head. Higginbotham (2003) calls this phenomenon "switch-headedness".

My approach has two advantages here. Firstly, under the conception of adjectival

semantics given in section 3.1 above, *all* attributive adjectives are functors, taking an $\langle e,t \rangle$ nominal argument. This is the view adopted by Lewis (1972) and Kamp (1975) in the Categorial tradition, and much more widely for the class of modal adjectives, and it represents a re-unification of the category "attributive adjective" after the three-way split in Higginbotham (1985). Secondly, although this apparently means that all attributive adjectives display switch-headedness, the reanalysis of the notions of specifiers, heads, and complements in terms of their compositional semantic function removes this problem. It does so by removing the notion of syntactic headedness.

We have sketched characterisations of two basic relationships formed by initial Merge. A head is a functor which takes its complement as an argument, and outputs the complement's semantics with an extra free variable position or index. A specifier is a complete, "closed off" argument to the function denoted by its sister, which then projects with a variable position bound by the semantics of the specifier. In either case, then, it is clearly not true that, semantically, only one sister projects, and there seems to be no reason to suppose that that is true syntactically, either. The further combinatorial, syntactic, possibilities of the mother are determined by both daughters, and so it seems counterproductive to say that only one projects.

It then appears that the statement given above from Chomsky (1998) is a simplification: it is correct to say that Merge occurs to satisfy requirements of one of the daughters: this much is necessary within the conception of functor–dependent relationships. However, the notion of projection is not so simple, and attributive adjectives are one of the cases where Chomsky's claim does not hold.

We have the following cases to consider:

(153) a. **Merger of a head and a complement.**
Under standard considerations, the head projects.
This is because the head may introduce a free variable position, which determines what can be merged next in specifier position. Also, the notion that the head projects is seen in the notion of the functional sequence. This can equally well be captured by saying that the next head to be merged in the functional sequence is dependent on the index or variable introduced by the current head.

b. **Merger of a specifier and its sister.**
Under standard considerations, the sister projects.
This is because the only effect of the specifier is to serve as an argument in the semantics of the sister.

c. **Merger of an adjunct and its sister.**

> This is the sticking point. . .

In the first two cases above, syntactic headedness and semantic functordom coincide, which makes the notion of syntactic headedness somewhat redundant. This is along the lines of the above statement from Chomsky (1998): if syntactic headedness is predictable, it can be omitted from the representation of the derived syntactic object. For at least the case of modal adjectives, however, this is not true, under Higginbotham's conception, and I propose to extend this analysis to all other regular attributive adjectives in English and French.

If we follow this line, it is clear that all attributive adjectives are functors. In the conception of the nature of heads, complements and specifiers sketched in this appendix, it is clear that the relationship between an attributive adjective and its sister is head–complement rather than specifier–sister, because the nominals that adjectives modify are nominal properties, rather than DPs or any "closed off" category such as may be found in specifier position. This provides an answer to the puzzle of "switch-headedness": there is only one type of headedness, and so no possibility of "switch-headedness". According to the definitions in (153), attributive adjectives are heads, and the nominals they modify are their complements. This is obscured under the standard conception of syntactic headedness because attributive adjectives are of an identity type $\langle \alpha, \alpha \rangle$, and so the output of functional application is of the same type as the sister, and so it appears that the nominal projects.

This is an elaboration of the position suggested by Abney (1987), and I noted the objections of Bernstein (1993) in section 3.1 above. There were two principle objections: adjectives as heads taking NP complements complicates the complement-selection process, or functional sequence; and pre-nominal adjectives could be internally complex, with productive syntactic formation options involving degree markers such as 'very'. Under this new conception, however, neither of these objections hold.

Firstly, the $\langle \langle e,t \rangle, \langle e,t \rangle \rangle$ type of attributive adjectives makes them essentially transparent from the point of view of the functional sequence, as the combinatorial possibilities of the Adj–N group are identical to those of the noun alone. Making headedness a uniquely semantic notion in this way allows us to preserve Abney's insight that adjectives are heads, while maintaining the appearance that, syntactically, the noun projects, in a relatively elegant way.

Secondly, there is nothing in the framework I have proposed to prevent a head from being syntactically complex: the notion of a head is instead defined in terms of

its function. This is, I claim, what we are seeing in the case of 'very'. I will ignore, for simplicity, the use of 'very' with adverbs, and concentrate instead solely on its use with adjectives. I will assume that degree modifiers are of type $\langle\langle e,t\rangle, \langle e,t\rangle\rangle$, restricted to apply only to adjectival properties capable of taking degree modifiers. I assume this because degree modifiers are perfectly acceptable in copular constructions, as in (154):
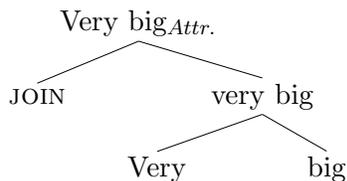
(154) 'That car is [very [big]].'

The formation of a noun phrase containing an attributive adjective modified by a degree marker then proceeds as follows:

(155) a. Merger of degree marker and adjectival property.
Degree marker 'very' is of type $\langle\langle e,t\rangle, \langle e,t\rangle\rangle$;
Adjective 'big' is of type $\langle e,t\rangle$;
'Very big' is of type $\langle e,t\rangle$.
'Big' is not a specifier-type element, so:
Degree marker 'very' is a head, adjective 'big' is a complement.

$$
\begin{array}{c}
\text{Very big} \\
\diagdown \\
\text{Very} \qquad \text{big}
\end{array}
$$
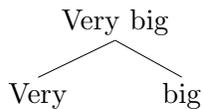
 b. Merger of JOIN and 'Very big'.
JOIN is of type $\langle\langle e,t\rangle, \langle\langle e,t\rangle, \langle e,t\rangle\rangle\rangle$;
'Very big' is of type $\langle e,t\rangle$.
'Very big' is not a specifier-type element, so:
JOIN is a head, 'very big' is a complement.

$$
\begin{array}{c}
\text{Very big}_{Attr.} \\
\diagup \diagdown \\
\text{JOIN} \qquad \text{very big} \\
\diagup \diagdown \\
\text{Very} \qquad \text{big}
\end{array}
$$

 c. Merger of Same^0 and root.
Same^0 is the functor;
Root 'car' is the dependent;
Root 'car' is not a specifier-type element, so:
Same^0 is a head, root 'car' is a complement.

$$
\begin{array}{c}
\text{Car}_i \\
\diagup \diagdown \\
\text{Same}^0 \qquad \text{car}
\end{array}
$$
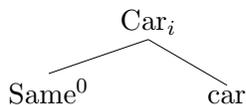
d. Merger of attributive 'very big' and nominal property 'car'.
'Very big'$_{Attr.}$ is of type $\langle\langle e,t\rangle,\langle e,t\rangle\rangle$;
'Car' is of type $\langle e,t\rangle$;
'Car' is not a specifier-type element, so:
'Very big'$_{Attr.}$ is a head, 'car' is a complement.

Very big car$_j$

Very big$_{Attr.}$ car$_i$

JOIN   Very big   Same^0 car

Very   big
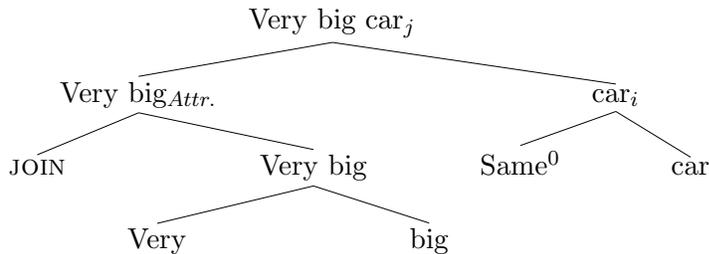
As for the other DP-internal adjectival uses noted in this thesis, focused adjectives (section 3.2) are clearly initially merged in the same way as here, and subsequently raised[74], and the attributive-predicative position (section 4.4.1) represents the sister of a DP specifier.

Of course, it will not do to rearrange phrase structure at will simply to make my proposals about attributive adjectives work, and there are many questions which this sketch raises, not least concerning movement: if the category "adjunct" is removed, we expect to see adjuncts creating locality effects: an attributive adjective should block head movement of a lower noun, for example. I will not attempt to address any of these questions in this sketch, although the viability of this proposal clearly rests on such matters. The hope, though, is that, in actual fact, very little changes. The division between semantically-driven merge and non-semantically-driven movement is present in Chomsky's distinction of interpretable from uninterpretable features, and is apparent in some syntactic theories in the form of AgrP (see, for example, Brody 2000). AgrP's validity is questioned by Chomsky (1995, 1998) on the grounds that it is semantically empty, but one can envisage a reformulation of the notion in terms of the clear difference between the semantic motivation for initial Merge and the non-semantic motivation for movement. As for the vague characterisation of the difference between a specifier-like element and a complement-like element, I would claim that this is not a problem restricted to my proposal here, but one applicable to cases of initial Merge in specifier position in more mainstream generative theories. This proposal, then, seems to lose very little, and may, fully developed, provide an elegant solution to the problem of the structural nature of the attributive adjective.

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[74]The nature of this movement, however, as with any other questions concerning adjuncts and movement, is problematic here, being from a head position to a specifier position.

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