

French Word Order and Lexical Weight

Anne Abeillé & Danièle Godard

IUF and University Paris 7, TALANA & CNRS, SILEX, University Lille 3

75251 Paris cedex 05 & 59653 Villeneuve d'Ascq cedex, France

Abstract

On the basis of the ordering of bare complements, modifying adjectives and certain adverbs in French, we show that certain constituents are more constrained than others, and we explain this situation in terms of weight, as one of the factors which determine word order. In addition to the distinction between heavy and non-heavy constituents, we propose that there exists a distinction among non-heavy constituents between 'light' and 'middle-weight' ones. We formalise this distinction in the feature based HPSG framework with a two-value (*lite* vs *non-lite*) feature WEIGHT, which is appropriate both for lexical items and phrases. Finally, we suggest that the lite vs non-lite distinction is universally available, although other word order properties make it more or less apparent in a given language.

Introduction¹

As usual with complex phenomena, progress in the comprehension of word order can only be made by isolating and studying each factor in turn. We concentrate our attention here on the syntactic constraints governing the order of complements and adjuncts in French, leaving aside discursive, pragmatic and stylistic factors. Accordingly, the grammatical judgements we provide are to be taken with an unmarked intonation, some of the sentences given as ungrammatical here being acceptable with a special prosodic pattern. The study of word order requires a great attention to the detail of the data. Nevertheless, we think it possible to arrive at generalisations which are both empirically accurate and theoretically interesting.

Recently, the question has been taken up of the relation between constituency and word order with the two questions: can word order be reduced to the hierarchical structure (Kayne [20], Cinque [11]), or does it constitute a separate component (Gazdar et al. [15], Pollard & Sag [26]),

¹ Previous versions of this paper have been presented at the 3rd International HPSG Conference (Marseille, May 1996), at the University Paris 7 (June 1996), at the Bangor Conference on Syntactic Categories (June 1996), at the University of Pennsylvania (October 1996), at Stanford University (January 1997), at SOAS (April 1997) and at ESSLI in Aix (August 1997). We thank audiences at these events for their comments, and, in particular, D. Arnold, J. Bresnan, R. Borsley, A. Copestake, D. Flickinger, G. Green, E. Hinrichs, S. Kahane, A. Kathol, S. Lappin, D. Meurers, P. Miller, C. Pollard, F. Popowich, R. Kempson, L. Sadler, I. Sag, P. Sells and P. Thibaut, as well as the anonymous reviewers for this book. This work was done while D. Godard was at Univeristy Paris 7 (CNRS). It is part of a larger project on French Syntax undertaken in collaboration with Ivan Sag, to whom special thanks are due.

and, in the second case, do the constituency and the ordering domains co-incide or does word order have a domain of its own, and, if so, how is it related to constituency (Reape [30], Kathol [19])? The word order facts we look at are not readily amenable to structural distinctions, and point to the existence of a separate word order component, but do not seriously challenge the view that the constituency and the word order domain co-incide.

Our main finding is classificatory: we bring to light a new syntactic factor which plays a role in word order, building on suggestions in Sadler & Arnold ([32], [33]) for the English NP, and Sells [36] for certain Korean facts. We show that certain constituents, which consist of a word, obey much stricter constraints than their phrasal counterparts or other such constituents. Roughly, they must occur first in the phrase or adjacent to the head. This suggests a weight constraint symmetrical to the well-known heaviness constraint which tends to order heavy elements last in their domain. Leaving heavy constituents aside, we contrast 'light' constituents with ordinary 'middle-weight' ones, using a two-value (*lite* vs *non-lite*) feature WEIGHT, which characterises both lexical items (they can be *lite*, *non-lite* or unspecified) and phrases (usually *non-lite*). Adopting the Head Driven Phrase Structure framework (HPSG, Pollard & Sag [26], [27]), we formalise order rules as constraints on the daughters in a phrasal type.² In this framework, we build on our empirical findings to propose a mixed theory of word order, which results from the interplay of the grammatical function and the weight of the daughters.

We begin with an examination of the order of complements in the VP, showing a systematic difference between bare complements and the others (section I), which we describe using the WEIGHT (WGT) feature in conjunction with phrasal constraints and LP rules for French (section II). We then apply the theory to account for the position of adjectives in the NP (section III). Finally, we go back to the adverbs in the VP, to give a fuller account of ordering in French (section IV).

I. The Order of Complements in the VP

We contrast phrasal complements (which we call 'non-lite', anticipating the weight feature) which occur freely to the right of the head in French, with bare complements (called 'lite') which must precede phrasal complements and are strictly ordered among themselves.

1. Free Order among Phrasal Complements

As has often been observed, complements in French are not ordered with respect to one another (leaving discursive factors aside).³ An indirect object may precede or follow a direct object (1), a predicative adjective may precede or follow a direct object (2):

² We follow a suggestion by E. Hinrichs and D. Meurers (p.c.).

³ Extracted or cliticised arguments are not analysed here as complements (see Miller [23], Miller & Sag [25] on clitics; Pollard & Sag [27], Bouma et al. [9], Sag 1997, on extraction; Abeillé et al. [5], for a general presentation in French).

- (1) Paul donne un livre à chacun/ donne à chacun un livre.
'Paul gives a book to everyone'
- (2) Cette musique rend mon fils fou de joie/ rend fou de joie mon fils.
'This music makes my son really happy' (lit: crazy of joy)

Similarly, a sentential or infinitival complement may precede or follow a nominal complement, with some preference for the second position due to heaviness:

- (3) Paul dit à Marie de venir/ dit de venir à Marie.
'Paul says to Marie to come'
- (4) Paul dit à sa fille qu'il fait beau/ dit qu'il fait beau à sa fille.
'Paul tells his daughter that it is nice weather'

The same mobility can be observed with complements of nouns:

- (5) La destruction de Rome par les Barbares/ par les Barbares de Rome.
'The destruction of Rome by the Barbarians'
- (6) La volonté de lutter de Jean/ de Jean de lutter.
'Jean's wish to fight' (lit: The wish of fight(ing) of Jean).

2. Lite Complements before non-lite Complements

Bare proper names and predicative adjectives have the same mobility as phrasal complements:

- (7)a Paul présente Géraldine à chacun / à chacun Géraldine.
'Paul introduces Geraldine to everyone'
- b Cette musique rend mon fils fou / rend fou mon fils
'This music makes my son really happy'

On the other hand, bare common nouns exhibit ordering constraints not observed with phrasal complements. First, they precede phrasal complements. Light verbs provide numerous instances of bare nominal complements, which invariably occur immediately after the verbal head:

- (8)a La course donne soif à Jean/ * donne à Jean soif.
'The race makes Jean thirsty' (lit: gives thirst to Jean)
- b Ce livre fait plaisir à Marie/ * fait à Marie plaisir.
'This book gives pleasure to Marie' (lit: makes pleasure to Marie)

However, when the same N has a complement or a determiner, it becomes as free as a phrasal complement:

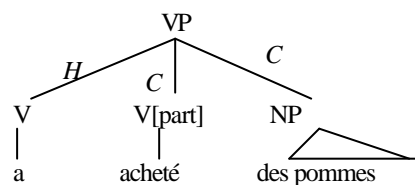
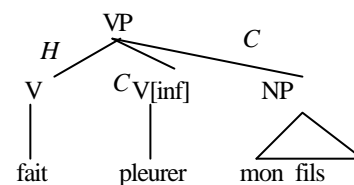
- (9)a La course donne une grande soif à Jean/ donne à Jean une grande soif.
'The race makes Jean very thirsty' (lit: gives a great thirst to Jean)
- b Ce livre fait le plaisir de sa vie à Marie/ fait à Marie le plaisir de sa vie.

'This book gives the pleasure of her life to Marie'

Modification by an adverb or conjunction of these N has a similar effect:⁴

- (10) La course donne [vraiment soif] à Jean/ donne à Jean [vraiment soif].
'The race makes Jean really thirsty' (lit: gives really thirst to Jean)
- (11) La marche donnera [faim ou soif] à Marie/ ? donnera à Marie [faim ou soif].
'A walk will make Marie hungry or thirsty' (lit: will-give hunger or thirst to Marie)
- (12) La vitesse fait [peur et plaisir] à Marie/fait à Marie [peur et plaisir].
'Speed gives fear and pleasure to Marie'

The same observation extends to another case of bare complements, the past participle in tense auxiliary constructions and the infinitive in causative constructions. We analyse tense auxiliaries and *faire* as the head of a flat VP, which takes as complements the participle or the infinitive and its complements (cf. Abeillé et al. [5]). The tree structure representations of these constructions are given in (13) where the function of the daughters is represented as an annotation on the branches:

- (13) a.  b. 

In this analysis, the auxiliary or the causative *faire* is the morphosyntactic head (H) of the construction, which inherits all the complements (C) of the bare participle or infinitive. Like other bare complements, it must precede all other non-lite complements.

- (14)a. Paul a acheté des pommes/ * a des pommes acheté.
'Paul has bought apples'
- b. Cette musique fait pleurer mon fils/ * fait mon fils pleurer
'This music makes my son cry' (lit: makes cry my son)

However, unlike the N in light verb constructions, these verbal complements must precede the other complements even when modified or conjoined:

- (15)a. Paul a [acheté et mangé] des pommes/ * a des pommes [acheté et mangé].
'Paul has bought and eaten apples'
- b. Paul fait [beaucoup rire] son fils/ * fait son fils [beaucoup rire].

⁴ We follow Gross [17] in allowing adverbs such as *vraiment* or *très* as modifiers of the N in light verb constructions.

'Paul makes his son laugh a lot'

As explained below, this difference between N and V does not depend on the category but on the requirement made by the predicate of which they are a complement. To account for the difference between (10-12) and (15), and in light of additional data on adjectives and adverbs (see sections III and IV), we will analyse coordination or modification of *lite* categories as potentially ambiguous between *lite* and non-*lite*.

3. Rigid Ordering of *lite* Complements

Unlike phrases, the bare complements mentioned above are rigidly ordered in the following way (leaving bare quantifiers aside⁵):

(16) Head < Past Part < Vinf < Bare Noun

The past participle must precede the other *lite* complements. It precedes the bare N in (17) and the bare V[inf] in (18):

(17) La course a donné soif à Marie/ * La course a soif donné à Marie.
'The race has made Marie thirsty' (lit: has given thirst to Marie)

(18) Paul a fait tomber le vase/ * a tomber fait le vase.
'Paul made the vase fall' (lit: has made fall the vase)

Similarly, the V[inf] precedes the *lite* nominal complements:

(19) Le Président fera rendre hommage aux victimes/ * fera hommage rendre aux victimes.
'The President will make one pay tribute to the victims' (lit: will-make pay tribute to the victims)

II. A Feature-based Treatment

Before presenting our analysis with the feature WEIGHT, we briefly show why alternative analyses based on morphological incorporation or syntactic distinctions completely independent from word order properties are inappropriate.

1. Alternative Analyses

The existence of bare complements has seldom been recognised as a syntactically relevant phenomenon. Some analyses have proposed to deal with them in the morphology. Auxiliary constructions are traditionally handled in the same chapter as verbal inflection in descriptive or

⁵ Bare quantifiers are another case of *lite* complements (Abeillé & Godard [4]):

(i) Paul passe tout à son fils/ ?? passe à son fils tout.
'Paul forgives everything to his son'

school grammars (e.g. Bescherelle [7], Grevisse & Goose [16]); there are also attempts to account for the position of the infinitive in causative constructions by postulating morphologically complex predicates (e.g. Zubizarreta [40]). However, a morphologically-based solution is not consistent with the data, because adverbs and PPs, which do not belong to the same word as the verbal head, can always occur between the head and the bare complements:⁶

- (20)a. Paul a évidemment acheté des pommes.
'Paul has of course bought apples'
- b. La musique fait depuis toujours pleurer mon fils.
'Music always makes my son cry a lot' (lit: music makes always a-lot cry my son)
- c. Le livre fera sans doute plaisir à Marie.
'The book will no doubt give pleasure to Marie'

If the past participle, the infinitival or the bare noun in (20) were part of the same word as the head V, so would the adverb; it is not clear how such a proposal could be justified.

As an alternative, one might think that some categories are adjoined to the V rather than at the same level as the regular complements. But many light V constructions (*faire plaisir* and *faire un grand plaisir*, *rendre hommage* and *rendre un vibrant hommage*, *avoir faim* and *avoir une faim de loup*) do not specify whether the complement is a bare N or an NP (with a determiner). The complementation of such light V's would be radically different, depending on whether the N has or doesn't have a determiner. While not impossible, this structural difference would require independent justification.⁷

Another hypothesis is to use categorical distinctions. Distinguishing between V and VP (or S) complements could account for the contrast between (14) and (4-6). One could simply say that V complements must precede VP (or S) complements. But a similar distinction is more problematic for nominal complements. One could contrast bare nouns as NPs with 'maximal' nominal phrases or proper names as DPs, only the second being referential (e.g. Abney [6], Longobardi [22]) and we would simply say that NPs must precede DPs in French. But if bare *soif* is an NP, one cannot see how the adjunction of an adverbial modifier (*vraiment soif*) would turn it into a DP; analogously, it is difficult to have coordination of nominal complements ("NPs") such as (10)-(12) recategorized as DPs. A category-based account will be even more difficult to account for the potential ambiguous behaviour of certain modified or conjoined phrases (see sections III and IV). A feature-based account seems more appropriate for this kind of underspecification.

⁶ Morphological incorporation of adverbs in French has still to be argued for convincingly.

⁷ Note that the bare N can allow the passive:

- (i) Hommage sera enfin rendu aux victimes. (tribute will finally be paid to the victims')
- (ii) Un vibrant hommage sera enfin rendu aux victimes.

Another categorical distinction would make use of bar-level distinctions. This is Sells' proposal to account for similar word order restrictions in Korean, where certain bare complements and adverbs resist scrambling and must immediately precede the head (Sells [36]). Assuming a binary phrase structure for Korean, Sells contrasts X₀ categories which must combine with an X₀ head, with X₁ and X₂ categories which can combine with an X₁ head; only the phrases with an X₁ head can scramble. The analysis can be summarised as follows:

- (i) words, rather than maximal projections only, can be complements or modifiers,
- (ii) certain words, but not all, are prevented from projecting X₁ or X₂ phrases by themselves,
- (iii) certain syntactic phrases must be defined as X₀ categories (the negation-verb syntactic combination for instance), while others are X₁ or X₂.

The effects of this proposal are very similar to what we also want for the French data. However, we find that X-bar theory is not the most appropriate tool. Proposals (ii) and (iii) represent a real difficulty for a bar level representation, particularly when adverbs are taken into account. The word order phenomena under investigation reflect properties of the lexical items; because they cannot be reduced to valence requirements, and because the combinatorics is not different when the phrase behaves ambiguously and when it behaves only as a usual maximal projection, a bar level distinction is not appropriate. Anticipating the following discussion, certain adverbs in the VP must be adjacent to the lexical head like common nouns and others are more mobile like proper names or maximal projections (see section IV). While we might associate the difference between common nouns and proper names with the fact that the first but not the second is valence saturated, this does not make sense with adverbs. Turning to the ambiguous phrases (*vraiment soif*, *faim et soif*), it is impossible to get both X₀ and X₁ or X₂. Again, as soon as the need for underspecification and sharing of value is recognised, a feature-based approach is more appropriate than one based on distinct categories.

Bratt [10] uses two features to get three levels of structure. Analysing the sequence made of a causative verb and its infinitival verb complement in French (*faire rire* in *Paul fait rire son fils* 'Paul makes his son laugh', lit: makes laugh his son), as a verbal complex, she notes this category with the two features: [LEX±] and [PHRAS±].⁸ While a word usually is [LEX+, PHRAS -] and a (usual) phrase [LEX -, PHRAS +], this complex is [LEX-, PHRAS-]. Proper names could be specified as [LEX+, PHRAS+] in the lexicon (her suggestion); our problematic combinations (*vraiment soif*, *faim et soif*), could then be underspecified ([LEX-, PHRAS±]), and the ordering constraints would say that [PHRAS -] come before [PHRAS+] constituents. However, the

⁸ Pollard and Sag [26] and Sadler and Arnold [32] also use the LEX feature to account for ordering observations. Pollard and Sag appeal to it in connexion with the verbal particle. Given the lack of mobility of the particle co-occurring with a pronominal accusative complement (*John looked it up/* John looked up it*), as opposed to its mobility with a nominal one (*look up the answer/ look the answer up*), and the fact that such pronouns also resist dative shift (*They gave it to Mary/ * They gave Mary it*), we are tempted to analyse personal pronouns as lite complements. See §3.5. for a discussion of Sadler and Arnold's proposal.

empirical justification for PHRAS is not clear, as soon as some words (proper names, but also most adverbs) have to be [PHRAS +], while some syntactic combinations are [PHRAS-], and others would have to be ambiguous.

We conclude that, in the same way as word order phenomena are not reducible to matters of constituency, the appropriate notation for them requires the use of a feature which is not reducible to other independent features.

2. The Feature WEIGHT

In a way analogous to the heaviness constraint (which says that heavy phrases tend to come last, cf. Wasow [37]), we propose that a constraint holds for light weight words or phrases which tend to come first in the phrase (just before or just after the lexical head). We call them 'lite' to make the point that lite is not just the contrary of heavy, the usual phrases being in fact 'middle-weight'. Lite constituents cluster with the head V. Ignoring heaviness phenomena here, we speak of a contrast between lite and non-lite constituents. The feature WEIGHT, present both in the lexicon and phrases, aims at capturing a general theory of word order.

First, not all lexical items have the same weight value: they may be [WGT *lite*], [WGT *non-lite*] or unspecified (with a general constraint that words are not heavy). Thus, we distinguish between common nouns, which are lite, and proper names, which are non-lite. Usually, predicates require their arguments to be non-lite; however, light verbs may allow (or require) that they be lite or unspecified.

Second, while most phrases are non-lite, we allow certain phrases to be lite, such as *acheté et lu* in (15a) or (23):

- (23)a Paul a acheté et lu *La Recherche*
 b *Paul a *La Recherche* acheté et lu
 'Paul has bought and read *the Recherche*'

In (23) the coordination of participles is lite, because tense auxiliaries obligatorily take a *lite* V complement, that is, a participle which is unsaturated for all of its subcategorised complements. This subcategorisation is represented in (24), as the value of the syntactic attribute ARG-ST whose first element corresponds to the subject and the others to complements; the identity of the integers means identity of the value for the lists (which is left unspecified), and H the concatenation of lists (Abeillé and Godard [2], Abeillé et al. [5]):

- (24) *avoir*: ARG-ST < [1] , V[WGT *lite*, ARG-ST < [1] > H [2]] > H [2]

The first complement of the auxiliary is the lite participle, and the second is identified with the list of complements that this participle itself subcategorises for. Accordingly, the conjunction *acheté et lu* must be lite when it is a complement of the auxiliary. Sentence (23b) is out because the [WGT *lite*]

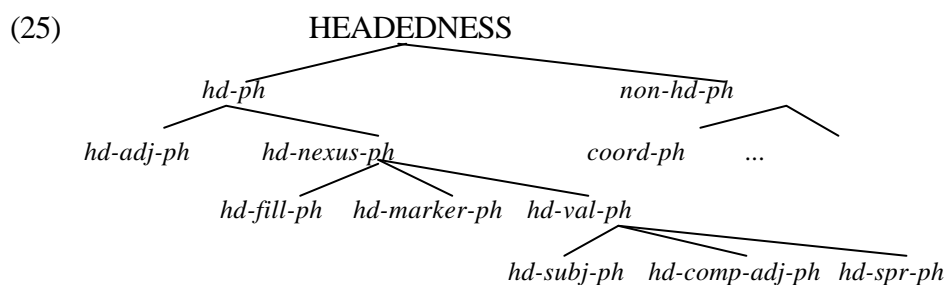
constraint on the coordination of past participles conflicts with the constraint that orders lite complements before non-lite ones.⁹

The question that must be raised, then, is whether we can or should dispense with head-only-phrases. Given that the occurrence of lite and non-lite arguments depends on the subcategorisation of predicates, which does not say whether they are words or phrases, do we need to build, or do we have arguments against building, a head-only-phrase ? It turns out that we can dispense with head-only-phrases, at least regarding the data under consideration here. Since the weight distinction is what counts for subcategorisation as well as word order, we get the right results if we accept combining words in the syntax. On the other hand, we have no argument which shows the head-only-phrase to be inconsistent with our findings. The head-only-phrase can give the right results if its description is identical to that of the head, in particular regarding weight and valence, and if syntax combines only phrases. In this paper, we will explore a representation which does not use head-only-phrases, in order to keep constituency as simple as possible. The reader should keep in mind that this is a matter of representation, and can replace our representation combining words by head-only-phrases, if it suits his/her taste better.

3. Liteness in Phrasal Descriptions

The basic idea of the HPSG representation of linguistic expressions, or signs, is that all signs can be classified in types (noted with italics), which are associated with feature structures meeting certain constraints (Pollard & Sag [26], Sag [34]). Signs divide into words (the unit for syntax) and complex constituents (phrases), which have daughters (hence the attribute *DTRS*). We examine here the consequences of the proposed *WEIGHT* feature for the representation of the relevant constituents.

Let us first present the organisation of phrases we assume:



This hierarchy is identical to that in Sag [34], except for the *hd-marker-phrase*, and the *hd-adj-comp-phrase* which we propose for French, containing the complements and the adjuncts at the

⁹ Note that in our perspective, lite phrases are associated with argument structures, which can no longer be the sole attribute of words (contra Pollard & Sag [27], cf. Pollard & Calcagno [28]).

same time.¹⁰ As regards weight, we propose a general constraint such that all head-nexus-phrases are non-lite:

(26) *head-nexus-phrase* => [WEIGHT *non-lite*]

In order to account for lite phrases, illustrated in (15a) and (23) by the coordination of participle complements, we propose the following constraints on head-adjunct-phrases and coordinated-phrases:¹¹

(27)

a.
$$\left[\begin{array}{l} \textit{hd-adj-ph} \\ \text{HEAD-DTR} \quad [\text{WGT } \boxed{1}] \\ \text{NON-HD-DTRS} \quad \langle [\text{WGT } \boxed{2}] \rangle \end{array} \right] \Rightarrow [\text{WEIGHT} (\boxed{1} \cup \boxed{2}) \Delta \textit{non-lite}]$$

b.
$$\left[\begin{array}{l} \textit{coord-ph} \\ \text{NON-HD-DTRS list} ([\text{WGT } \boxed{1}] \dots [\text{WGT } \boxed{n}]) \end{array} \right] \Rightarrow [\text{WEIGHT} (\boxed{1} \dots \cup \boxed{n}) \Delta \textit{non-lite}]$$

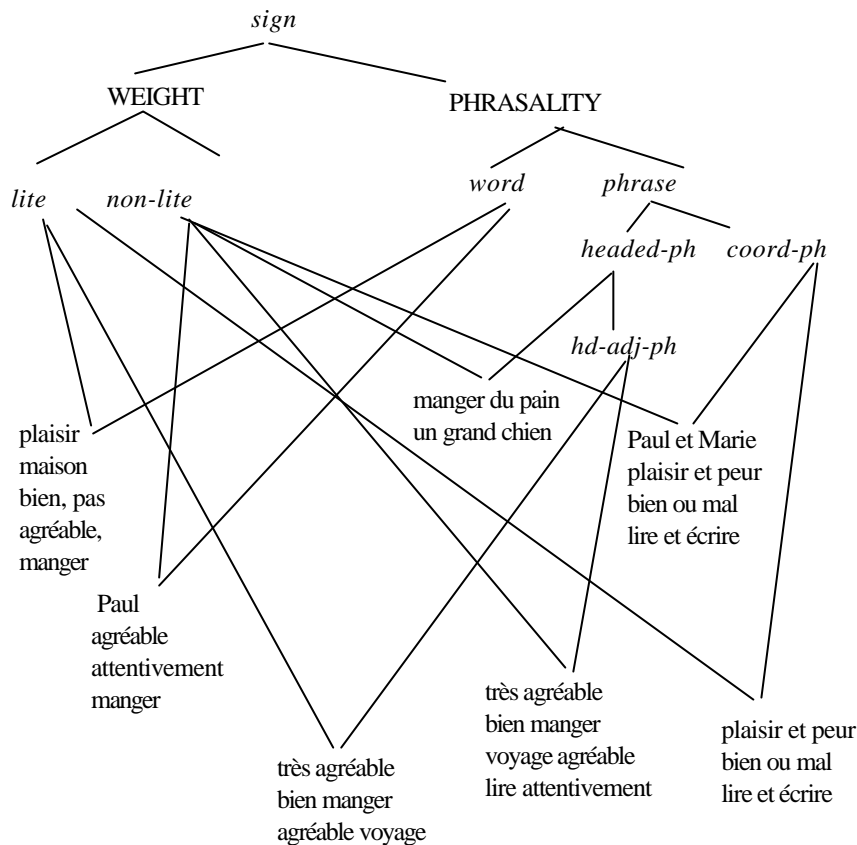
Constraints (27a) and (27b) allow such phrases to be lite iff all the daughters are lite. The daughters are not required to have the same weight ($\boxed{1}$, $\boxed{2}$ and \boxed{n} may be different); however, the values can unify only if they are identical. Accordingly, the first disjunct in the value for the phrase is equivalent to ‘lite’ if the daughters are all lite, to ‘non-lite’ if they are all non-lite; since union fails if the daughters do not have the same weight value, the value for the phrase in this case is given by the second disjunct (non-lite).

Since both signs and phrases can be lite or non-lite, the introduction of the WEIGHT feature leads to a more complex classification of signs, cross-classifying them for the two dimensions of weight and phrasality:

¹⁰ See Kasper [18], for the same proposal for German, and Pollard & Sag [26] (p. 165) for English. We rely on the ‘minimal recursion semantics’ to give the right semantics for this flat structure (Copestake et al. [12]).

¹¹ See also §3 below for further examples of modified or conjoined phrases specified as lite.

(28) The hierarchy of signs and the feature WEIGHT



In the lexicon, nouns and adverbs are unambiguously specified as *lite* or *non-lite* : all proper names are *non-lite*, and all common nouns *lite* in French. Most adverbs are *non-lite*, while some are *lite* (see section IV). Verbs and adjectives can be underspecified for weight: most verbs are underspecified and can behave either as *lite* or *non-lite*. Adjectives may be *lite*, *non-lite* or underspecified, depending on their pre- or post-nominal position in the NP (see section III). Words which are underspecified for Weight are specified in context, given the constraint on weight in the phrase in which they appear.

As an example, we represent in (29a) the analysis of the sentence *Paul viendra* according to the hypotheses presented in this section, and we give in (29b) the description of the head-subject phrase to which it corresponds:¹²

(29)

a. $hd-subj-ph \Rightarrow \left[\begin{array}{l} \text{HEAD-DTR} \quad \textit{non-lite} \text{ [SUBJ} < \boxed{1} > \text{]} \\ \text{NON-HD-DTRS} < \text{SYNSEM} \quad \boxed{1} > \end{array} \right]$

b. $\begin{array}{c} \textit{SUBJ} \quad \textit{S} \quad \textit{H} \\ \text{N}[\textit{non-lite}] \quad \text{V}[\textit{non-lite}] \\ | \quad \quad \quad | \\ \text{Paul} \quad \quad \quad \text{viendra} \end{array}$

¹² The fact that we don't require a lexical V or N to be always dominated by a phrase is reminiscent of Categorical Grammar and Dependency Grammar. As mentioned earlier, we could also have *non-lite* NP and VP here dominating *non-lite* N and V.

Although somewhat unusual in phrase structure frameworks, the representation in (29b) is perfectly in keeping with the formal apparatus for categories in HPSG. The notation 'VP' has no theoretical status in this framework; it is an abbreviation for a phrasal constituent whose lexical head is a V, which is (normally) saturated for its complements, but is missing a subject. Similarly, an 'NP' abbreviates a phrase whose head is a lexical N, and which is saturated for its complements and specifier; it is *non-lite* and also 'maximal' to use the usual parlance, while the VP is not maximal, since the verb is considered the head of the sentence. Thus, if one does not want to use head-only-phrases, the only phrase in the sentence *Paul viendra* is a hd-subj phrase. There is no VP because the verb has no complement and we have no head only schema. There is no NP either, since the subject is a proper name. Both the subject and the head are non-lite words; the verb *viendra* is non-lite because most V's are lexically unspecified for weight, and the constraint on hd-subj phrases requires the head to be non-lite. The Subject daughter is not so constrained and can be lite (as in *Hommage sera rendu aux victimes* 'tribute will be paid to the victims'); it is non-lite in (29b) because proper names are lexically non-lite.

Two Linear Precedence constraints are associated with phrasal descriptions, making use of the function of the daughters and independent of weight ('<' means 'precedes'):

- (30)a. *hd-nexus-ph* => Non-Hd-Dtrs / < Head-Dtr
 b. *hd-comp-adj-ph* => Head-Dtr < Non-Hd-Dtrs

Constraint (30a) states a default relation (noted /) on head-nexus phrases; it orders markers, fillers, specifiers and subjects (all 'non-head daughters') before the head. Constraint (30b) is more specific and overrides the default; it orders complements and adjuncts (as 'non head daughters') after the head in head-complements-adjuncts phrases. Pre-modifiers only occur in the head-adjunct phrase (see (66)). We now turn to the Weight feature, which plays a role in ordering non-head daughters among themselves.

4. Weight and the Order of Complements in the VP

We are in a position to state the Linear Precedence constraints responsible for the generalisations concerning French word order which we have uncovered:

- (31) Generalisations concerning word order
- (i) There is free order among non-lite complements
 - (ii) Lite complements precede non-lite complements
 - (iii) Lite complements are ordered among themselves

No LP rules are needed to account for (i): only constraints have to be specified, not freedom of order. The LP constraints responsible for generalisations (ii) and (iii) are given in (32):

(32) (preliminary version)

- hd-comp-adj-ph* => a. [lite] < [non-lite]
 b. [COMPS < [1] >] < [1]

These constraints are added to (30b). Constraint (32a) orders lite complements (or adjuncts) before non-lite complements (or adjuncts), as well as the lite head before the non-lite non-head daughters. Constraint (32b) says that a daughter must follow the daughter that subcategorises for it, whether the latter is the head or a complement. So the nominal complements (lite or non-lite) of the past participle in compound tense constructions must follow the past participle which is a complement and which subcategorizes for them.

Let us now see how these rules give the right results for the data mentioned in section I, beginning with the bare complements, which are [WGT *lite*]. Note that such complements, which are freely allowed by phrasal descriptions, are constrained by the specific verb requirements: the verb itself says whether it can take [WGT *lite*] complements, or whether they must be [WGT *non-lite*] (the default case). In (33), where H stands for Head and C for Complement, the lite complement *soif* precedes the non-lite one *à Marie*, as required by (32a), and the lite complement *soif* follows the lite complement *donné* which subcategorises for it, as required by (32b):

- (33) a. *a* in (33c,d,e): [COMPS <donné[lite], soif[lite], à-Marie[non-lite]>]
 b. *donné* in (33c,d,e): [COMPS <soif[lite], à-Marie[non-lite]>]

| | | | | | |
|------|-----------|---------|---------|-------------|-------------|
| c. | la course | a | donné | soif | à Marie |
| | | H[lite] | C[lite] | C[lite] | C[non-lite] |
| d. * | la course | a | donné | à Marie | soif |
| | | H[lite] | C[lite] | C[non-lite] | C[lite] |
| e. * | la course | a | soif | donné | à Marie |
| | | H[lite] | C[lite] | C[lite] | C[non-lite] |

The tense auxiliary *avoir* is the head and inherits the complements of the participle, as seen in (24), instantiated in (33): it must precede the participle and the other complements according to (30b). Both nominal complements are on the complement list of the past participle and must follow it according to (32b). A similar situation holds for causative constructions (Abeillé et al. [5]): the causative head takes as complements the lexical infinitive, the causee, as well as the complements subcategorised by the infinitive (34a);¹³ the data in (34c) receive a parallel explanation, given the description of *fait* in (34b):

- (34) a. *faire* : [COMPS <V[lite, SUBJ <X_i>, COMPS [1]], X_i> H [1]]
 b. *fait* in (34c): [COMPS <V[inf, lite], NP [à, non-lite], N[lite]>]

¹³ We ignore the different realisations of the causee, depending on the transitivity of the V [inf].

c. Le bruit fait avoir peur à mon fils/ * fait avoir à mon fils peur
 'The noise frightens my son (lit: makes have fright to my son)

d. Paul fait laver le chien à Marie / fait laver à Marie le chien
 'Paul makes Marie wash the dog' (lit: makes wash the dog to Marie/ to Marie the dog)

The N *peur* being lite must occur before the non-lite complement *à mon fils* in (34c), while the two non-lite complements in (34d) are unordered with respect to each other.

We now turn to those phrases which behave as lite or non-lite. In (35a), the complement *vraiment soif*, where the bare N *soif* is modified by a lite adverb, occurs before the non-lite complement, and can be either lite or non-lite; in (35b), it must be non-lite since it follows the non-lite complement *à Paul*.

| | | | | |
|--------|-----------|---------|---------------|---------------|
| (35)a. | la course | donne | vraiment soif | à Paul |
| | | H[lite] | C | C[non-lite] |
| b. | la course | donne | à Paul | vraiment soif |
| | | H[lite] | C[non-lite] | C[non-lite] |

'Running makes Paul thirsty' lit: gives Paul (really) thirst

The light verb *donner* selects for a nominal complement without specifying its WGT feature, thus allowing both the lite complements *soif* or *vraiment soif* and the non-lite complements *une grande soif* or again *vraiment soif*. We find a similar situation with conjoined lexical complements: *faim et soif* can be either lite or non-lite in *la course donne faim et soif à Paul* ('Running makes Paul hungry and thirsty' lit: gives hunger and thirst) but must be non-lite in *la course donne à Paul faim et soif*, since the sequence follows the non-lite complement *à Paul*.

The coordination of lite verbal complements is also underspecified for WGT. But as a verbal complement of the tense auxiliary, or of the causative verb, it is contextually constrained to be lite (see (24)). (36b) is excluded by constraints (32b) and (32c). Note that we allow environments to which a constraint apply to overlap.

| | | | | |
|--------|------|---------|-------------------|-------------------|
| (36)a. | Paul | a | acheté et lu | ton dernier livre |
| | | H[lite] | C[lite] | C[non-lite] |
| b.* | Paul | a | ton dernier livre | acheté et lu |
| | | H[lite] | C[non-lite] | C[lite] |

'Paul has bought and read your lastest book'

III. The Position of Adjectives in the NP

We now apply our approach to the problem of adjunct ordering, considering first the position of adjectives in the NP. We show that an approach in terms of syntactic weight is superior to two analyses proposed for similar phenomena in English.

1. A Lexically-constrained distribution

What determines the relative positions of the modifying adjective and the head N is a long-standing problem in French grammar (e.g. Forsgren [13], Wilmet [39]). While we do not deny the role of stylistic and possibly semantic factors for a full account of the relative order of the A and the N, we choose again to concentrate on purely syntactic constraints. From this point of view, we distinguish between three lexical classes of adjectives in French:

(a) Prenominal only adjectives:¹⁴ certain non-intersecting adjectives such as *grand1* ('great'), which contrasts with *grand2* ('big, tall'), *ancien1* ('former'), *futur1* ('future', 'to-be'), *soi-disant* ('would-be'), *faux1* ('fake, forged').

(37)a. Un grand homme Un homme grand.
'A great man' 'A tall man'

b. Un faux coupable / * Un coupable faux.
'A fake culprit' / 'A culprit fake'

(b) Postnominal only adjectives:¹⁵ denominal adjectives such as *français* ('French'), *présidentiel* ('presidential'), *régional* ('regional'), which alternate with a *de* N complement (*français= de France*), adjectives which are derived from participles such as *aîné* ('first-born'), *séduit* ('seduced'), *abandonné* ('deserted'), *attendu* ('expected'), adjectives denoting colors (*vert*, 'green' etc.), and some adjectives denoting forms (*carré*, 'square', *rond*, 'round'):

(38)a. Son fils aîné / * son aîné fils.
'Her son first-born' / 'Her first-born son '

b. Les exportations françaises / * les françaises exportations.
'The exports French' / 'The French exports'

(c) Pre or post-nominal adjectives: most adjectives belong to this class in French (Wilmet [39]); examples are given in (39):

¹⁴ Grammar books also include cardinal and ordinal numbers, or indefinites (*certain(s)* 'some') as prenominal adjectives. We consider their classification as modifying adjectives to be uncertain.

¹⁵ Some postnominal adjectives may occur prenominal in highly marked (literary) constructions, which we analyse as borrowings from an older system: *son blanc manteau* ('its white coat'), *les vertes frondaisons* ('the green foliage'), *la royale aventure de la maison de Savoie* ('the royal adventure of the Savoie House').

- (39)a. Un agréable voyage/ un voyage agréable
'A pleasant trip'/ 'A trip pleasant'
- b. Les nombreux arguments de Paul/ les arguments nombreux de Paul.
'Paul's numerous arguments' (lit: the numerous arguments/the arguments numerous of P.)

There is no clear semantic counterpart to this syntactic behaviour. We consider the position of bare adjectives to follow from a syntactic property present in the lexical description, which we note with the feature WEIGHT: prenominal adjectives are lite, and post-nominal ones are non-lite, while indifferent ones are underspecified in the lexicon and contextually analysed as either lite or non-lite. French differs from English in that most adjectives are underspecified, while most of them are lite in English.

2. Syntactic Constraints on Adjective Position

a. Prenominal Adjectives

Before the N, adjectives have the same behaviour in French as in English (Sadler & Arnold ([32], [33])). First, they cannot have complements (Blinkenberg [8]):

- (40) Une longue (*de 2 mètres) table/ Une table longue de 2 mètres.
'A long table'/ 'A table 2 meter long'
- (41) Une facile (* à remporter) victoire/ Une victoire facile à remporter.
'An easy victory'/ 'A victory easy to obtain'

Second, they cannot have phrasal modifiers:¹⁶

- (42) Cette étrange (*à vos yeux) décision/ * Cette décision étrange à vos yeux.
'This strange decision'/ 'This decision strange in your eyes'

They can be modified or conjoined (with lite modifiers or conjuncts), and still appear prenominally:

- (43)a. Une trop facile victoire. 'A too easy victory'
- b. Une très / plus / si longue table. 'A very/more/so long table'
- c. Une étrange et agréable aventure. 'A strange and pleasant adventure'

These observations apply to all adjectives, whether they are lite or non-lite in the lexicon. A very interesting property of lexically lite adjectives is that modification or coordination enables them to appear postnominally, with exactly the same meaning (Blinkenberg [8]):

- (44)a. Des faux coupables / * Des coupables faux. 'Fake culprits'

¹⁶ The same constraint holds for all prenominal modifiers (adjectives or nouns) in English (cf. Pollard & Sag [26]:73): *The [toxic waste dump] management/ * The [dump for toxic waste] management.*

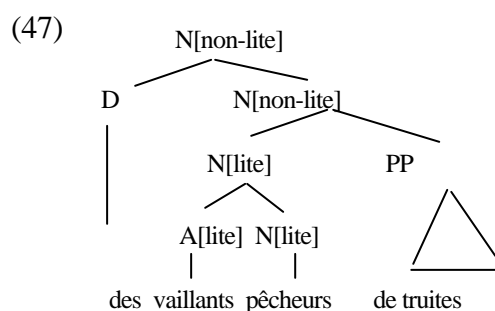
- b. Des vrais coupables / * Des coupables vrais. 'Real culprits'
- c. Des [vrais ou faux] coupables/ Des coupables [vrais ou faux].
'Real or fake culprits/'Culprits real or fake'
- (45)a. Les anciens sénateurs/ * Les sénateurs anciens. 'The former senators'
- b. Les actuels sénateurs/ ? Les sénateurs actuels. 'The present senators'
- c. Les [anciens ou actuels] sénateurs/ Les sénateurs [anciens ou actuels].
'The former or present senators/'The senators former or present'

These properties follow from our analysis if prenominal A's are lite: adjectives with their complements are non-lite (the value for head-nexus-phrases, cf. (26)); conjunctions of lite expressions are either lite or non-lite, cf. (27b), hence the data in (43c), (44), (45); modification of a lite constituent by a lite adjunct may be lite, cf. (27a), hence the data in (43).

Not only are prenominal adjectives themselves lite, but they can only modify a lite head N. Clearly, they cannot modify an NP since they must follow the determiner and don't have wide scope over a coordination of NP's. They cannot either modify a sequence made of an N and its complement(s). We illustrate this point with determinerless nominal sequences allowed as complements of prepositions .

- (46)a. Il a tourné la page sans grande peine de coeur ou haine de soi
'He changed his lifestyle without much heartbreak or self hatred'
- b. C'est un endroit idéal pour vaillants pêcheurs de truite et amoureux de la nature
'It is the ideal place for daring trout fishers and nature lovers'

In (46a) the only interpretation is that the *peine de coeur* (heartbreak) is big, not the self hatred. In (46b) only the trout fishers are supposed to be daring not the lovers of nature. A discussion of the NP structure is clearly outside the scope of this paper.¹⁷ We interpret (46a,b) by saying that the prenominal adjective adjoin lower than the complement of the noun, as shown in (47) :



¹⁷ We are keeping the traditional analysis where the determiner combines with a N saturated for its complements. See Miller [23] for a proposal that some determiners combine with a lite head N (unsaturated for its complements).

We conclude that the prenominal A's can only modify a lite head N.

b. Postnominal Adjectives

As we have seen, postnominal adjectives can have complements or phrasal modifiers. Moreover, they may permute with the complements of the N:

- (48) Les exportations françaises de fromage / Les exportations de fromage françaises.
'The French exports of cheese' (lit: the exports French of cheese/ of cheese French)
- (49) Un livre intéressant sur les Indiens / Un livre sur les Indiens intéressant.
'An interesting book about Indians' (lit: a book interesting about Indians)

This shows that postnominal adjectives can appear as sisters of the complements of the noun, and hence as sisters of the head N itself.¹⁸ This is not their only structural position. They also occur to the right of an NP, as shown by their possibly taking wide scope over a coordination of NP's:

- (50) Des chantiers d'autoroutes et des projets de zones industrielles importants
'Important creations of highways and projects of industrial parks'

The NP in (50) can denote a plural entity made of several creations of highways and of several projects of industrial parks which are all important. Postnominal A's must be non-lite (they can have complements), and they modify either a lite N (occurring at the same level as the complements) or a non-lite NP.

3. Weight and Constituency

Summarizing, we constrain prenominal and postnominal A's to be respectively lite and non-lite. When the A is bare, the weight value comes from the lexicon; with an adjectival phrase, it comes both from the lexicon and the weight value of the phrase. Note that prenominal adjectives can be quite long: *une incroyable et fatigante mésaventure* ('an incredible and tiring misadventure'), as noted particularly in Wilmet [39], Miller et al. [24]. We now exemplify the structures.

Adjectives in the NP are adjuncts, where adjunct is a grammatical function. In French, they are allowed by two phrasal descriptions, the head-adjunct phrase and the head-complement-adjunct phrase, which we give in (51). The first one has only two daughters, the head and the adjunct, the second allows the complements and the adjuncts at the same level. Both are necessary in the NP as well as the VP domain. Note that, in keeping with our representational choice (see section II 2), we constrain the hd-comp-adj-phrase to contain at least one complement daughter with the value 'non-empty list' (*nelist*): this implements the idea that there is no head-only-phrase (which would be the case if the complements were optional). 'o' notes the shuffle of the complement and adjunct lists:¹⁹

¹⁸ We cannot enter into a detailed discussion of all the other alternatives here, but we see no reason to assume that the adjective is adjoined to the head noun and then possibly 'extraposed' to the right of the complements.

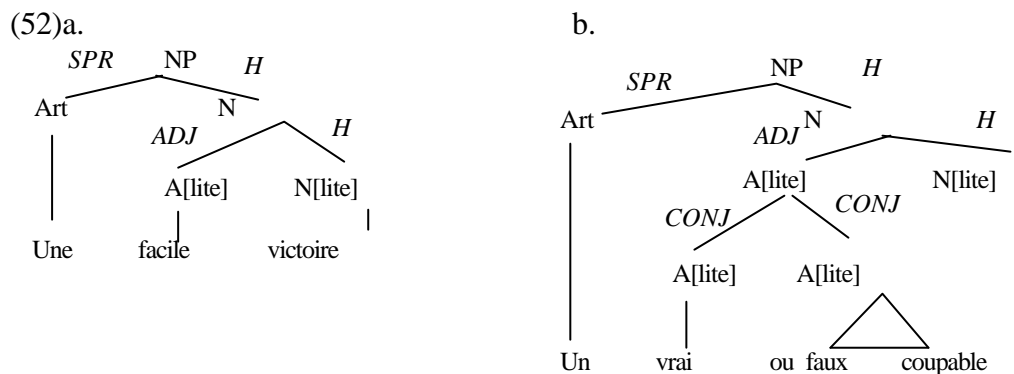
¹⁹ The shuffle operation takes two lists and gives a third list which respects the ordering relation of both.

- (51)a. $hd\text{-}adj\text{-}ph \Rightarrow \left[\begin{array}{l} HEAD\text{-}DTR \quad [SYNSEM \quad \boxed{1}] \\ NON\text{-}HD\text{-}DTRS \langle [MOD \quad \boxed{1}] \rangle \end{array} \right]$
- b. $hd\text{-}comp\text{-}adj\text{-}ph \Rightarrow \left[\begin{array}{l} HEAD\text{-}DTR \quad \boxed{1} \left[\begin{array}{l} \textit{lite} \\ COMPS \langle \boxed{2} \dots \boxed{n} \rangle \end{array} \right] \\ NON\text{-}HD\text{-}DTRS \textit{nelist} ([SYNSEM \quad \boxed{2}] \dots [SYNSEM \quad \boxed{n}]) \textit{O list}([non\text{-}lite, MOD \quad \boxed{1}]) \end{array} \right]$

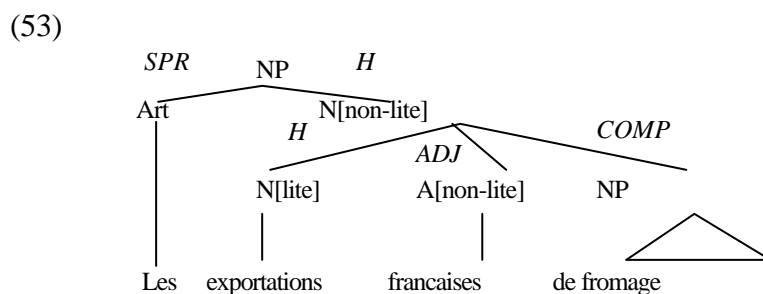
Although weight is relevant for the *hd-adj-ph* (the weight value of the *hd-adj-ph* is a function of the weight of its daughters), the daughters themselves are not constrained; but the adjunct daughters in the second schema are constrained to be non-lite, and the head to be lite.

Adjuncts have a MOD feature whose value is identified with the synsem (the syntactic and semantic description) of the head. Lite adjectives are [MOD *noun* [*lite*]], so that they only combine with a lexical N (or a conjunction of lexical N). On the other hand, non-lite adjectives are [MOD *noun*], so that they combine with a nominal category of any weight; accordingly, they occur at the same level as complements, where they (may) modify a lite N, or they are adjoined to the (non-lite) NP.

We first exemplify prenominal adjectives, allowed by description (51a):



Post-nominal adjectives are allowed by either description in (51). For *hd-comp-adj-phrase* (51b) to apply, we need at least one complement at the same level as the adjunct. This is the case in (48), (49), but not in (41), (42):



The *hd-comp-adj-phrase* type correctly allows the structure in (53): the different daughters of the phrase labelled N [*non-lite*] are the head, a complement and a non-lite adjunct (by lexical

(56)

| | | | |
|------|-----|--------------------|--------------------|
| a. | Une | facile | victoire |
| | | ADJUNCT[lite] | H[lite] |
| b. | Une | victoire | facile |
| | | H[lite] | ADJUNCT[non-lite] |
| c. | Une | victoire | facile à remporter |
| | | H[lite] | ADJUNCT[non-lite] |
| d. * | Une | facile à remporter | victoire |
| | | ADJUNCT[non-lite] | H[lite] |

We now illustrate the proposal with adjectives specified as *lite* in the lexicon:

(57)

| | | | |
|------|-----|---------------|-------------------|
| a. | Des | faux | coupables |
| | | ADJUNCT[lite] | H[lite] |
| b. * | Des | coupables | faux |
| | | H[lite] | ADJUNCT[lite] |
| c. | Des | vrais ou faux | coupables |
| | | ADJUNCT[lite] | H[lite] |
| d. * | Des | coupables | vrais ou faux |
| | | H[lite] | ADJUNCT[non-lite] |

Being *lite*, the adjectives *vrai*, *faux* must precede the head, according to (55). However, according to (27b), the conjunction *vrai ou faux* is underspecified, and, like the lexically underspecified *A facile*, may occur both before the head (as a *lite* adjunct) or after the head (as a *non-lite* adjunct). On the other hand, the post-nominal only adjective *vert* is specified as *non-lite* in the lexicon, and, according to (55), must occur after the head:

(58)

| | | | |
|------|----|-------------------|-------------------|
| a. | Un | carré | vert |
| | | H[lite] | ADJUNCT[non-lite] |
| b. * | Un | vert | carré |
| | | ADJUNCT[non-lite] | H[lite] |

5. Alternative approaches

Let us now compare our analysis with two alternatives which have been proposed for English NP's, where the constraint on prenominal adjectives resembles the French constraint. As is

well-known, bare adjectives generally occur in prenominal position (59a,b), but adjectives with a complement (59c,d) or a post-modifier (59e,f) must follow the head N:²¹

- (59)a. A proud / happy man.
- b. ?* A man proud / happy.
- c. * A proud of himself man.
- d. A man proud of himself.
- e. * A happier than you man.
- f. A man happier than you.

Two proposals have been made to account for these data, which we examine now.

a. Williams' head final filter

Williams [38] proposes a head-final filter (HFF) to account for the contrast illustrated in (59): the adjectival phrase must end with the adjectival head in order for the AP to precede the head. This proposal, which he extends to German as well, presents a number of difficulties. First, there is a well-known counter-example to the generalisation, since an adjective modified by *enough* can be prenominal, although it is not head final (*a fair enough proposal*). Second, the HFF encompasses only a part of the data which we account for. For example, it doesn't say anything about coordination. One should add that both conjuncts have to be head final for the coordination to be prenominal, since *big and tall* is prenominal, while *bigger than you and tall* is not. More importantly, it has nothing to say about the difference between lite and non-lite head final phrases. Only certain premodifiers are allowed with a prenominal adjective both in English and French, although the detail of the data differs. Degree modifiers are good in French in general, but a subclass of them cannot modify a prenominal adjective in English, and manner or point of view adverbs in general are bad in French:

- (60)a. Une (très) importante décision.
- b. A (very) important decision
- c. *A so important decision/ A decision so important
- d. *Une politiquement importante décision/ Une décision politiquement importante.
'A politically important decision' (lit: a decision politically important)

On the contrary, the contrasts illustrated in (60) follow from our analysis: since a head-adjunct phrase (such as Adverb-Adjective) with a lite head can be lite or non-lite depending on the weight

²¹ The only apparent exceptions to this generalisation are some prenominal lexicalised expressions (*a God-is-dead philosophy, an easy-to-please guest*) and measure adjectival phrases usually written with hyphen (*a two-meter long table*), which could be analysed as lite (compounds).

of the adverb, we predict that *très importante* (or *very important*) with a lite adjunct can be lite, while *politiquement importante* (or *so important*) with a non-lite adjunct cannot.²²

More generally, the HFF aims at explaining why certain adjectival phrases must occur post-nominally but doesn't raise the question of the distribution of adjectives before or after the head N in a general way (even in English, there are A's which must occur post-nominally, as in *the president elect*, *the heir apparent*, cf. Quirk et al. [29] §5.18), and is disconnected from other generalisations concerning word order. In our analysis, the HFF would follow from more general constraints on syntactic weight.

b. Sadler and Arnold's LEX feature

A more ambitious approach to the problem of the adjective in the English NP has been taken by Sadler & Arnold [32], [33]. Their analysis is based on the binary feature LEX, which works in the following way: (a) words are [LEX+]; (b) certain phrases are [LEX+], where [LEX+] elements are conjoined, or a [LEX+] adjunct modifies a [LEX+] head; (c) there is an 'agreement' of LEX features in the head adjunct phrase, so that [LEX+] adjectives can only modify [LEX+] N, while AP's ([LEX-]) modify NP's ([LEX-]). The generalisation concerning word order is simply that [LEX+] adjectives precede, while [LEX-] adjectives follow the head N.

We retain the basic idea of Sadler and Arnold, in that we make the order of expressions depend on a syntactic feature, in conjunction with combinatorial properties of adjuncts and heads. However, we cannot adopt their system for the following reasons. First, items in the lexicon are not uniformly [LEX+], since we have to distinguish among adjectives and among adverbs in French. Adopting the LEX feature becomes counter-intuitive: not only must [LEX+] phrases be distinguished from [LEX-] phrases but also [LEX+] words from [LEX-] words in the lexicon. Second, we would be forced to analyse some modified or conjoined [LEX+] heads as unspecified for the LEX feature rather than [LEX+], since they occur both to the left and to the right of the head N.²³ Third, as postnominal adjectives are at the same level as complements in French, we would allow a [LEX-] phrase to modify a [LEX+] head, which shows the absence of agreement in the LEX features of the head and the adjunct. Finally the binary feature LEX is not appropriate for an analysis of the placement of the adjective as part of a general theory of word-order.

IV. Ordering Adverbs in the VP

1. Adverb Classification

We finally consider adverbs in the VP, showing how the syntactic weight feature plays a crucial explanatory role in their ordering. Although an in-depth study of adverbs is clearly outside the

²² The positioning of such adverbs is not captured by (55). Anticipating section IV, we say that a non lite adverb can occur either before or after a non lite head (*une décision politiquement importante / importante politiquement*) cf (66).

²³ This is also necessary in English to explain why such phrases occur after the N: *her so beautiful daughter, a daughter so beautiful*.

scope of this paper, we briefly present our classification, in order to properly circumscribe the role of 'liteness'. Leaving aside semantic aspects, we cross-classify adverbs along three different dimensions: their adjunction sites, their value for weight, and their function (complements or adjuncts in the VP).²⁴

Abeillé & Godard [3] propose that adverbs occur in two different structures: (a) they are adjoined to a verbal category, conforming to the head-adj-phrase constraint (51a) here, and (b) they occur among complements and at the same level, conforming to the hd-comp-adj-phrase constraint in (51b). There are three adverb classes, depending on which verbal category (the S, the VP or the lexical V) they adjoin to: S-adverbs adjoin to all of them, VP-adverbs adjoin to some VP as well as to the lexical V, and V-adverbs adjoin to the lexical V only. Although there is some connection between such classes and the semantics of the adverb (since it must have scope at least over the category it adjoins to), there is no simple relationship between the two behaviours. We will examine here V-adverbs, which are mostly scalar and quantity adverbs such as *bien*, *beaucoup*, *mal*, *peu*, *à peine*, *plus*, *trop* ('well, a-lot, badly, a-little, more, too-much').

All adverbs occur on the right of the finite V, independently of their possible adjunction site in a head-adjunct-phrase.²⁵ However, some are constrained to immediately follow the head V (and precede the complements) while others are mobile, and freely interspersed among the complements. This distinction resembles that of lite vs non-lite complements, all the more so because constrained adverbs are bare words. There is some overlap between the distinction based on adjunction sites, and weight: all V-adverbs are lite. However, the two factors do not co-incide: all lite adverbs are not V-adverbs. While most S-adverbs are non-lite, *jamais* ('never'), or *soudain* ('suddenly'), which are S-adverbs, are lite, and, if VP-manner-adverbs (*attentivement*, *bruyamment*) are non-lite, strictly negative adverbs (*pas*, *plus*, *point*), which are also VP-adverbs (they adjoin to infinitival VP) are all lite. As with adjectives, there is no one-to-one relationship between length and 'liteness' at the lexical level: although many lite adverbs are monosyllabic, this is not the case for all of them (e.g. *jamais*, 'never', *toujours*, 'always', *beaucoup*, 'a lot', *à peine*, 'barely'), and a few non-lite adverbs may be monosyllabic (*là* 'there').

A third distinction is relevant: adverbs in the VP may have the function of adjuncts or complements, although most of them are adjuncts. Certain adverbs are subcategorised, for instance when they alternate with locative PP's (*ici* 'here', *là* 'there'); moreover, we consider negative adverbs (*pas*, *plus*, *point*, *jamais*) as well as other lite adverbs, to be included among the complements, of finite V's for the first, of all V's for the second (Abeillé & Godard [3], Kim & Sag [21]).

Our classification resembles that in Cinque [11], although there are also differences. Using two criteria, where the adverbs can occur, and whether they are characterised by ordering

²⁴ Semantic factors may have the effect of further restricting the occurrence of certain adverbs.

²⁵ Schlyter [35] was the first to note that modal adverbs (*évidemment*, 'evidently') occur in the VP in French.

constraints, Cinque distinguishes three classes of adverbs (and PPs): the 'higher adverbs', which may occur before the subject and are ordered among themselves, the 'pre-VP adverbs', which occur around the V and are also ordered, and the 'circumstantial adverbs' (denoting time, location, cause, manner etc.), which may occur high in the sentence but are not strictly ordered. The 'pre-VP' adverbs correspond to our V-adverbs plus the negation.²⁶ Apart from differences due to the framework, there are two main differences. First, we leave aside the ordering of adverbs among themselves. While we agree with Cinque that it may well reflect semantic properties, we do not make the hypothesis that there is a one-to-one relationship between syntactic ordering and semantic scope. Thus, while S-adverbs tend to be ordered among themselves, even in the VP, they are not totally so, and, although circumstantial adverbs tend to be free, they are not totally so either.²⁷ Second, we cross-classify the adverbs rather than try to have the different criteria converge towards homogeneous classes. This is what allows us to bring to light the role of liteness, since lite adverbs belong to otherwise different syntactic classes, and there are other lite categories besides adverbs.

Restricting our attention to the class of lite V-adverbs and contrasting them with non-lite adverbs, we show how the use of the WEIGHT feature enlightens adverb position, and allows most of the LP rules already defined to apply to adverbs.²⁸

2. Freedom of *non-lite* Adverbs

We first check that some adverbs to the right of the head verb are mobile and may permute with its complements. This is true for for a manner adverb such as *gentiment*, and for a subcategorised adverb such as locative *là*.²⁹

- (61)a. Paul a gentiment lu ce livre à sa grand-mère.
'Paul has kindly read this book to his grand-mother'

²⁶ Post-verbal adverbs can only be called 'pre-VP' in an approach which condones V movement. While the negation adjoins to the infinitival VP (it is a VP adverb in our classification), it is also, like adverbs in general, a post-verbal adverb at the same level as the complements (although only when the V is finite). Since it is lite, it behaves like the V-adverbs in postverbal position.

²⁷ For instance, the evaluative and modal adverbs (both 'higher adverbs') are not ordered among themselves, although the evaluative one has semantic scope over the second (Abeillé & Godard [2]):

- (i) Paul arrivera probablement malheureusement en retard. ('Paul will probably unfortunately arrive late')
(ii) Paul arrivera malheureusement probablement en retard.

On the other hand, a time adverb such as *immédiatement* must precede a manner adverb (both 'circumstantial adverbs'):

- (iii) Paul a immédiatement bruyamment contre-attaqué. ('Paul has immediately loudly counter-attacked')
(iv) * Paul a bruyamment immédiatement contre-attaqué.

²⁸ We leave aside lite negative adverbs and also the class of so-called 'adverbial' adjectives (*coûter cher* = 'to be expensive', lit: to cost expensive cf. Grevisse & Goose [16], §926):

- (i) Paul ne voit jamais son père/ * ne voit son père jamais. ('Paul never sees his father')
(ii) Paul a payé cher cette erreur/ ?? a payé cette erreur cher. ('Paul paid a heavy price for this mistake')

²⁹ The data concerning certain S-adverbs are difficult. Some speakers only accept them before the complements.

- b. Paul a lu gentiment ce livre à sa grand-mère.
 - c. Paul a lu ce livre gentiment à sa grand-mère.
 - d. Paul a lu ce livre à sa grand-mère gentiment.
- (62)a. Paul a rangé là le livre pour sa grand-mère.
'Paul has put the book there for his grand-mother'
- b. Paul a rangé le livre là pour sa grand-mère.
 - c. Paul a rangé le livre pour sa grand-mère là.
 - d. * Paul a là rangé le livre pour sa grand-mère.

We consider these adverbs to be specified as [WGT *non-lite*] in the lexicon. Being non-lite complements, subcategorised locative adverbs such as *là* must follow lite complements (62d), but are not ordered with respect to other non-lite complements (62a)-(62c). This follows normally from LP constraints (30b) and (32a). However, according to constraint (32a), non-lite adjuncts should follow lite complements (e.g. past participles), which is not what we observe in (61a). To account for the difference between adverbs and other non-head daughters, we introduce the feature [ADV±], and restrict constraint (31a) to apply to [ADV –] non-lite daughters:³⁰

- (63) (final version)
- hd-comp-adj-ph* => a. [lite] < [non-lite, ADV –]
b. [COMPS < [1] >] < [1]

Constraint (63a) allows all adverbs and PPs (lite or non-lite), which are [ADV +], to occur before lite constituents, but the possibilities are further restricted by constraint (30b), which says that the head comes first, and by (63b) which says that subcategorised constituents follow the predicate; accordingly, only non-lite adjuncts may come before the past participle, hence the difference between (61a) and (62d).

Contrary to what constraint (55) leads one to expect, in the *hd-adj-ph* phrase, non-lite adjuncts are not ordered with respect to the verbal head : they can precede or follow a VP (64) or an S (65):

- (64)a. Paul, probablement, viendra à Paris. / viendra à Paris probablement.
'Paul probably will come to Paris'
- b. Attentivement examiné, le tissu révèle des imperfections. / Examiné attentivement ...
'Carefully examined, the material shows defects'

³⁰ Only [ADV+] categories may modify a V. Although all adverbs are [ADV+], the feature [ADV±] cannot be replaced by the category adverb: it is relevant for other categories such as N's and A's. Bare Q complements (which are lite N[ADV+]), but not bare A complements (which are lite A[ADV–]), occur before the participle (Abeillé & Godard [4]): *Paul a tout lu* ('Paul has read everything', lit: has all read), **Paul a cher payé son erreur* ('Paul has paid a heavy price for his mistake', lit: has costly paid). In a fuller account of word order, (63b) would also mention the feature [ADV–] on the right hand side.

- (65)a. Administrativement, le problème est compliqué. /
Le problème est compliqué, administrativement.
'Administratively, the problem is intricaded'
- b. Bientôt, Paul sera là. / Paul sera là bientôt.
'Soon, Paul will be here'

As these data show, the order of the non-lite adjunct and the head in the hd-adj-phrase depends on whether the head is nominal or not. We reformulate the right part of rule (55), in order for it to apply to nominal heads only:

- (66) (final version)
hd-adj-ph =>
- a. Non-Hd-Dtr [*lite*] < Head-Dtr
 - b. Head-Dtr [*lite or noun*] < Non-Hd-Dtr [*non-lite*]

3. Lite V-Adverbs

Contrasting with the preceding class are V-adverbs, to which we now turn. We show first that they can only adjoin to a lite V[*non-fin*]. They must follow a finite V (67a), but can occur either to the right or to the left of an infinitival (67b). A priori, they could be adjoined to the VP[*inf*], or to the lexical V[*inf*]. The fact that they cannot have wide scope over a conjunction of VP's indicates that they adjoin to the lexical V only:

- (67)a.* Bien Jean lisait le texte/ * Jean bien lisait le texte/ Jean lisait bien le texte
'Jean read the text well'
- b. Jean voulait [bien lire le texte]/ [lire bien le texte]
'Jean wanted to read the text well (lit: to well read the text)'
- c. Jean voulait [bien lire le texte et l'expliquer aux élèves].
'Jean wanted to read the text well and explain it to the students'
- d. Paul voulait très bien lire le texte
'paul wanted to read the text very well' (lit: wanted to very well read the text)'

(67c) cannot convey that Jean wanted to explain the text well to the students, only that he wanted to have a good comprehension of the text.³¹

³¹ In addition, these adverbs also occur to the left of past participles, where they don't have wide scope over a conjunction of participial phrases, but cannot occur to the right of the participle (if they are bare):

- (i) Pourtant (très) bien parti, il n'a pas fini glorieusement la course.
'Although he started well (lit: although well started), he did not finish the race in glory'
- (ii) ? Bien parti dans la première course et arrivé dans la seconde, il ne nous a pas fait honte.
'Having started well (lit: well started) in the first race and arrived in the second one, he did not disgrace us'
- (iii) Parti *(vraiment) bien dans la première course, il nous a fait honneur.

To account for the distribution to the left of V, we propose that these adverbs are lexically specified as modifying lite V[*non-fin*] (where non-finite forms include infinitive and participles). Turning to their distribution to the right of V, unlike the adverbs examined in section IV 2., their position to the right of the (finite or infinitival) V is restricted; they must occur before the other complements, both non-lite (68) and lite (69):³²

- (68)a. Paul se souvient peu de sa jeunesse/ ?? se souvient de sa jeunesse peu.
 'Paul doesn't remember his youth much ' (lit: remembers not-much his youth)
- b. Paul promet de travailler mieux en classe/ ?? de travailler en classe mieux
 'Paul promises to work better in class'
- (69) Paul rendra bien hommage aux victimes/ * Paul rendra hommage bien aux victimes
 'Paul will well pay tribute to the victims''

Moreover, they are free when they are modified (70) or have a complement (71):

- (70) Paul lira très bien Corneille/ lira Corneille très bien
 'Paul will read Corneille very well'
- (71) Paul rendra mieux que toi hommage à Corneille/ rendra hommage mieux que toi à
 Corneille / rendra hommage à Corneille mieux que toi
 'Paul will pay tribute to Corneille better than you'

These properties are of course reminiscent of the behaviour of lite adjectives in the NP and of the bare N complements in the VP. We conclude that V-adverbs are lexically specified as lite.

The next question is that of their function. Accepting their adjunct status to the left of the lite V, we propose that they are complements to the right of the V, at least when they are lite.³³ The argument relies on the contrasts illustrated in (67). If it were possible for a lite adjunct to occur indifferently to the left or the right of the V, it would be difficult to explain why it can occur both to the right and to the left of an infinitival (67b), but only to the right of a finite V (67a). We get this intricate pattern of occurrence with the following analysis:

- (a) these adverbs adjoin to a non-finite (infinitival or participle) lite V only;
 (b) as lite adjuncts, they occur to the left of the lite V, not to its right;

'(Having) started *(really) well in the first race, he did us credit'

Thus, they adjoin to lite non-finite V in general, but are not the complement of lite V[ppart].

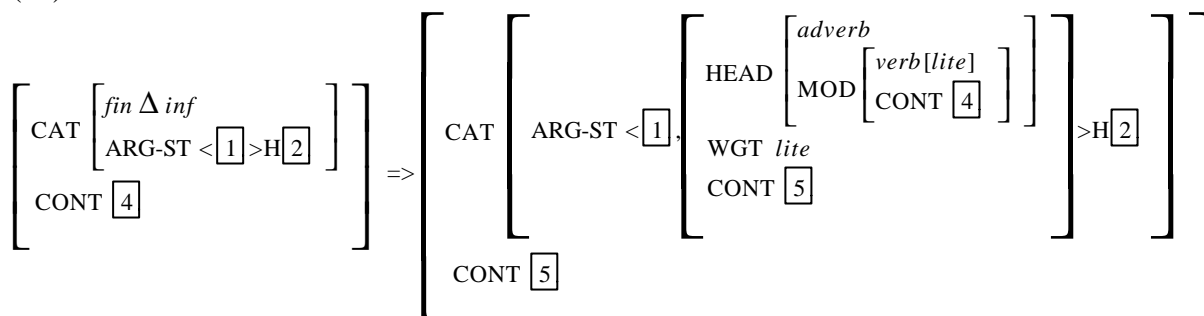
³² The reader should note that stressed lexical adverbs are treated as non-lite; accordingly, the examples in (68) are better with a stress on the adverb. The properties of lite adverbs (their behavior when conjoined, modified or stressed) are also noted independently in Cinque [11].

³³ There is an alternative analysis: lite adverbs would form a lite phrase with the lite V, whether they are on the left or the right of the V. We do not propose this, because of (a) the contrast between (67) and examples (ii), (iii) in fn 31, which would remain unexplained, and (b) NCC facts, which indicate that NCC only conjoins sisters in French (Abeillé, in prep); these adverbs can occur in NCC: *Paul déclame bien Corneille et mal Racine*. (Paul recites Corneille well and Racine badly').

(c) if *lite*, they are included into the complements by a Lexical Rule (LR), which applies to finite and infinitival V.³⁴

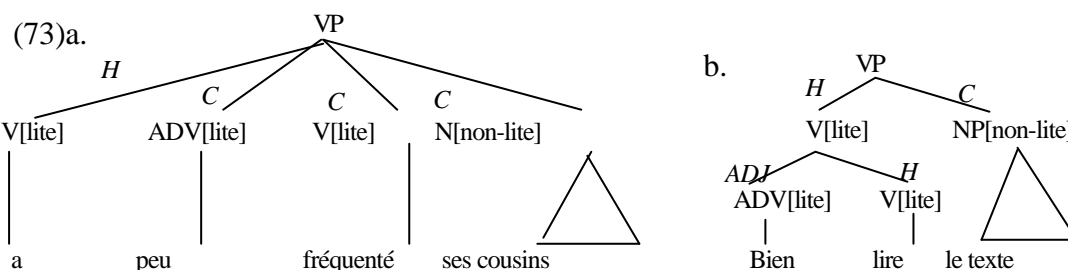
The LR including V-adverbs among the complements is given in (72):

(72) V-ADVERB COMPLEMENT INSERTION LEXICAL RULE



This LR takes as input a verb expecting a number of arguments ($\boxed{1}$ corresponds to the subject, and $\boxed{2}$ to the complements) and returns a verb with a V-adverb added as the first complement (the sign H is for list concatenation). The verbal content is modified in the output: it is the same as that of the adverb ($\boxed{5}$) which takes (the content of) this verb as an argument ($\boxed{4}$). Although the inserted adverb behaves syntactically as a complement, it still behaves semantically as a functor. The adverb description is not modified; its MOD value only serves to circumscribe the class of verbs taking the adverb as complement and to instantiate the new content of the verb with the adverb as complement.³⁵

The phrase-structure for (69), for example, is given in (73a), and that for (67b) in (73b):



Lets us finally turn to the ordering constraints dealing with V-adverbs, which can be either adjuncts or complements (see LR (72)). The ordering constraints associated with the hd-adj-phrase are in (66). V-adverbs as *lite* adjuncts, precede the head (66a); this allows *bien lire le texte* (67b).

³⁴ But not to past participles. By restricting the LR to insertion of *lite* adverbs into the complement list, we eschew ambiguity for the *non-lite* adverbs of this class (with modification or complementation) which are adjuncts to the right of the V; we also get the right facts for participles (cf fn 31): given that the LR fails to apply to them, participles can only combine with V-adverbs as adjuncts; when they are on the right of the past participle they must be *non-lite*, given the LP (55) for the hd-adj-phrase, and the constraint on adjuncts in the hd-comp-adj-phrase (51b).

³⁵ Note that this LR is not isolated if a LR adding negative adverbs to the complement list of (finite) verbs is justified (Abeillé & Godard [3], Kim & Sag [21]). Although the two rules cannot be collapsed, they belong to the same family, reinforcing each other's plausibility.

As non-lite adjuncts, they must follow the lite head, because only lite adjuncts may precede a lite head. This accounts for the unacceptability of (74):

- (74) * Paul essayait de [mieux que toi] travailler.
 'Paul tried to work better than you' (lit: to better than you work)

The ordering constraints associated with the *hd-comp-adj-phrase* are given in (63). The first one, according to which lite constituents precede all non-lite non-adverbial ones makes sense of the behaviour of V-adverbs in (68), where they must precede the non-lite N. Moreover, since lite adverbs modified by a lite adverb can be either lite or non-lite, such phrases are allowed (as lite) to the left of the V[*inf*] as in (67d), on the one hand, and they are mobile in the VP (70), on the other one.

However, something more has to be said about (69), which shows that these lite adverbs must precede other lite complements. Using again the feature [ADV±], we add an LP constraint that orders non-head daughters which are both [ADV +] and lite before other lite non-head daughters:³⁶

- (75) *hd-comp-adj-ph* => [lite, ADV +] < Non-Hd-Dtr [lite, ADV -]

We now illustrate our analysis; the adverb is an adjunct in (76) and a complement in (77):

(76)

| | | | | |
|------|-----------------------|---------------------|-------------------|----------------|
| a. | Bien Vraiment bien | déclamer | Corneille | |
| | ADJUNCT[lite] | H[lite, non-finite] | COMP[non-lite] | |
| b. * | Déclamer | Corneille | bien | |
| | H[lite] | COMP[non-lite] | [lite] | |
| c. * | bien | déclame | Corneille | |
| | ADJUNCT[lite] | H[lite, finite] | COMP[non-lite] | |
| e. | Déclamer | Corneille | mieux que toi | |
| | H[lite] | COMP[non-lite] | ADJUNCT[non-lite] | |
| f. | Déclamer | mieux que toi | Corneille | |
| | H[lite] | ADJUNCT[non-lite] | COMP[non-lite] | |
| g. | rend | hommage | vraiment bien | à Corneille |
| | H[lite] | COMP[lite] | ADJUNCT[non-lite] | COMP[non-lite] |

³⁶. Some speakers accept lite adverbs after past participles, which we analyse as lite ([ADV -]) complements (a bien lu Proust / % a lu bien Proust). They don't have the LP constraint (75).

(77)

| | | | | |
|-------|----------------|-----------------------|------------------|----------------|
| a. | rend | bien vraiment bien | hommage | à Corneille |
| | H[lite,finite] | COMP[ADV +,lite] | COMP[ADV -,lite] | COMP[non-lite] |
| b. ?? | rend | hommage | bien | à Corneille |
| | H[lite,finite] | COMP[ADV -,lite] | COMP[ADV +,lite] | COMP[non-lite] |
| c. ?? | déclamer | Corneille | bien | |
| | H[lite,inf] | COMP[non-lite] | COMP[lite] | |

4. Summarizing LP constraints

At this point, it is useful to consider the full set of LP constraints which we propose in this paper:

I. Function-based LP constraints

hd-nexus-ph => 1. Non-hd-Dtr / < Head-Dtr

hd-comp-adj-ph => 2. Head-Dtr < Non-Hd-Dtr

II. Weight-based LP constraints

hd-comp-adj-ph => 3. [lite] < [non-lite, ADV -]

4. [lite, ADV +] < [lite, ADV -]

III. Mixed LP constraints

hd-comp-adj-ph => 5. [lite, COMPS <... $\boxed{1}$..>] < $\boxed{1}$

hd-adj-ph => 6. Non-Hd-Dtr [lite] < Head-Dtr

7. Head-Dtr [lite or noun] < Non-Hd-Dtr[non-lite]

To understand how the LP rules work, it is necessary to remember that word order is assumed to be free when no constraint is stated. In addition, all LP rules must be compatible with each other, but some may overlap, when a more specific constraint comes on top of another one (as is the case with LP5 and LP2).

The above constraints embody a mixed theory of syntactic word order according to which the ordering results from the combination of function and weight factors. There are also some differences based on syntactic category (the head value), but they play a minor, additional role.³⁷ While the function based constraint (LP2) stands alone in the *hd-comp-adj-ph* phrase, there is no such simple generalisation in the *hd-adj-ph* phrase, where the two factors are intermingled. It is interesting to

³⁷ This is the case with the introduction of the feature [ADV±] in the constraint associated with the *hd-comp-adj-ph* phrase, but also with the mention of 'noun' in LP7.

note that LP2, which formalises the idea that French is a head-initial language, in fact overrides the general ordering for hd-nexus-phrases. It has a counterpart in the hd-adj-phrase, in that only lite adjuncts are allowed to precede the lite head. Clearly, the head initial property in French characterises these specific phrase types.

Although the constraints making use of the weight factor accurately account for the intricacies of the data, they also do justice to the two intuitions with which we started: lite constituents precede non-lite ones, and lite constituents are ordered among themselves. The first intuition is embodied by LP3 for the hd-comp-adj-phrase: only non-lite adverbs blur the picture, which occur everywhere after the (lite) head (see LP2). Both LP rules for the hd-adj-phrase make use of the linear privilege of lite constituents over non-lite ones, although they also take into account other factors at the same time (function, and category). Most of the other rules (LP2, LP3, LP4, LP6) ensure a precise order of lite constituents, although they may achieve another effect at the same time. Abstracting away from further constraints (imposed by the category and the finiteness of the head), we have the following order:

(79) French lite cluster:

Adjunct [lite] < Head[lite] < Complements [lite] < Complements [non-lite]

Conclusion

Taking French as an example, we have shown that word order cannot simply be deduced from, or reduced to, questions of constituency. We draw attention to the importance of the distinction between lite and non-lite constituents, which is relevant both for lexical items and phrases, and is different from the usual distinction between heavy and non-heavy constituents. Most of the facts that we discuss are new. Roughly put, lite constituents come before the others and are ordered among themselves. Given that lexical heads come first in the head-complement-adjunct-phrase, this creates the impression of a lite cluster around the head. On this empirical basis, we propose a theory of word order which is formalised as constraints on the daughters of phrasal types, and makes use both of function (Head vs Non-Head) and weight (lite vs non-lite) distinctions.

Our proposal raises some unanswered questions. Similar constraints have been studied for Korean (Sells [36]) and for English modifying adjectives (Sadler & Arnold [32], [33]). This is an indication that the 'liteness' factor should be recognised as part of grammar, and justifies further work. In particular, since word order (as syntactically determined) presumably always results from the interplay of different factors, it would be interesting to know what other factors hide or reveal the liteness factor. The fact that non-lite constituents are free in the French VP, for instance, brings it to light, while the more rigid ordering of complements and adjuncts in the English VP tends to hide it.

The distinction between lite and non-lite words crosses traditional syntactic categories. Is it otherwise motivated? A semantic factor could make sense for nouns, since the divide separates

common nouns from proper names. However, a semantic distinction would not be easy to justify for adjectives or adverbs, where the specific behaviour of items cannot be fully predicted. Related but distinct questions are: is there a reason why the distribution of lexical (attributive) adjectives is so different in English, where most adjectives are *lite*, and in French, where most of them are unspecified for the feature? Is there a tendency for a given syntactic category to induce a certain weight, at least within a given language?

A different line of explanation involves language evolution or language processing. Diachronically and typologically, our *lite* elements are an intermediary step between syntax and morphologisation. Indeed, there is a stage in the evolution from Latin to French when personal pronouns were not cliticised (they had their own stress), but could not be separated from the verb, which makes them good candidates for being *lite*. Examples of nominal compounds, as well as of incorporation also come to mind (see the incorporation of certain bare adverbs in the Greek verb, Rivero [31]). From a synchronic point of view, there are possible explanations in terms of ease of parsing, or production, since these items tend to enter into more or less fixed collocations or to form complex semantic predicates with the head. The same arguments which motivate the role of heaviness in word order as a factor which facilitates parsing (Frazier & Fodor [14]) or production (Wasow [37]) might be made to explain why this class of *lite* elements cluster around the head.

References

1. Abeillé, A in prep. Non Elliptical Coordination of non-major Constituents in French, ms U. Paris 7.
2. Abeillé, A and D Godard. (1994). The Complementation of Tense Auxiliaries in French. *WCCFL 13*, 157-172. Stanford: CSLI Publications.
3. Abeillé, A and D Godard. (1997). The Syntax of French Negative Adverbs, in D. Forget, P. Hirschbühler, F. Martineau and M-L. Rivero (eds), *Negation and Polarity, syntax and semantics*, 1-27. Amsterdam: J Benjamins.
4. Abeillé, A and D Godard. (1997). "A Lexical account of quantifier floating", *4th HPSG Conference*, Cornell (to appear in A. Kathol, J-P. Koenig and G. Webelhuth (eds), *Lexical and Constructional Aspects of Linguistics Explanation*, Stanford: CSLI).
5. Abeillé, A, D Godard, P Miller and I. A. Sag. (1997). "Bounded Dependencies in French". in S. Balari & L. Dini (eds), *Romance in HPSG*, Stanford: CSLI Publications, to appear.
6. Abney, S. (1987). *The English Noun Phrase in its Sentential Aspect*, PhD Dissertation, MIT, Cambridge, Mass.
7. Bescherelle. (1980). *L'Art de conjuguer*, Paris: Hatier.
8. Blinkenberg, A. (1928). *L'Ordre des mots en français moderne*. Copenhagen: Munksgaard.
9. Bouma, G, R Malouf and I A. Sag. (1997). Satisfying Constraints on Adjunction and Extraction. Ms Stanford University.
10. Bratt, E. (1990). The French Causative Construction in HPSG. Ms. Stanford University.
11. Cinque G. (1997). *Adverbs and functional heads : A cross-linguistic perspective*, Oxford University Press.
12. Copestake, A, D Flickinger and I A. Sag. (1997). Minimal Recursion Semantics, an Introduction. Ms. Stanford University.
13. Forsgren M (1978). *La Place de l'adjectif épithète en français contemporain*, étude quantitative et sémantique, Stockholm: Almqvist & Wiksell.

- 14 Frazier, L & Fodor, J D. (1978). "The Sausage Machine: A New Two-Stage Parsing Model". *Cognition* 6: 291-325.
- 15 Gazdar, G, E Klein, G Pullum and I A. Sag. (1985). *Generalized Phrase Structure Grammar*, Cambridge: Cambridge University Press.
- 16 Grevisse, M and A. Goose. (1988). *Le Bon usage*, Liège:Duculot, 12th edition.
- 17 Gross M. (1975). *Méthodes en syntaxe*, Hermann: Paris.
- 18 Kasper, R. (1994). "Adjuncts in the Mittelfeld". in J. Nerbonne, K. Netter and C. Pollard (eds), *German in HPSG.*, 39-69. Stanford: CSLI Publications, distrib. University of Chicago Press.
- 19 Kathol, A. (1995). *Linearization-based German Syntax*, PhD Thesis, Ohio State University.
- 20 Kayne, R (1994). *The Antisymmetry of Syntax*, Cambridge: MIT Press.
- 21 Kim, J-B and I A. Sag. (1995). The Parametric Variation of French and English Negation, *WCCFL 14*, 303-317. Stanford: CSLI Publications.
- 22 Longobardi, G. (1994). "Reference and proper names", *Linguistic Inquiry*, 25.4: 609-666.
- 23 Miller, P. (1991). *Clitics and Constituents in Phrase Structure Grammar*, PhD Thesis, Utrecht University (published Garland, New York, (1992).
- 24 Miller, P, Pullum G, Zwicky A (1992). "Le principe d'inaccessibilité de la phonologie par la syntaxe : trois contre-
Lingvisticae Investigationes, XVI.2: 317-344.
- 25 Miller, P and I A. Sag. (1997). "French Clitics without Clitics or Movement". *Natural Language and Linguistic Theory* 15: 573-639.
- 26 Pollard C and I A. Sag (1987). *Information-based Syntax and Semantics*, vol. 1, CSLI series, distr. University of Chicago Press
- 27 Pollard Carl and Ivan A. Sag, (1994). *Head-driven Phrase Structure Grammar*. Stanford: CSLI and Chicago: Chicago University Press.
- 28 Pollard, C and M Calcagno. (1997). "Argument structure, structural case and French causatives", *4th HPSG Conference*, Cornell.
- 29 Quirk R, S Greenbaum, G Leech and J Svartvik. (1972). *A Grammar of Contemporary English*. London: Longman.
- 30 Reape M. (1994). "Domain Union and Word Order Variation in German". in Nerbonne J., K. Netter and C. Pollard (eds) *German in HPSG*, 151- 197.
- 31 Rivero M-L. (1992). "Adverb incorporation and the syntax of adverbs in modern Greek", *Linguistics and Philosophy*, 15: 289-331.
- 32 Sadler, L and D Arnold. (1993). Premodifying Adjectives in HPSG, Technical report, Essex.
- 33 Sadler, L and D Arnold. (1994). "Prenominal Adjectives and the phrasal/lexical Distinction", *Journal of Linguistics* 30: 187-226.
- 34 Sag, I A. (1997). "English relative clause constructions", *Journal of Linguistics* 33.2: 431-484.
- 35 Schlyter, S. (1974). "Une Hiérarchie d'adverbes en français et leurs distributions". in *Actes du colloque franco-allemand de grammaire transformationnelle*, C. Rohrer, N. Ruwet (eds) vol. 2, 76-86. Tübingen: Niemeyer.
- 36 Sells, P. (1994). "Sub-phrasal Syntax in Korean", *Language Research*, Seoul 30: 351-386.
- 37 Wasow T. (1996. Remarks on Grammatical Weight. Ms. Stanford University.

- 38 Williams, E. (1982). "Another argument that passive is transformational", *Linguistic Inquiry*: 160-162.
- 39 Wilmet, M. (1980). "Antéposition et postposition de l'épithète qualificative en français contemporain", *Travaux de Linguistique* 7: 179-201.
- 40 Zubizarreta, M-L. (1985). "The relation between morphophonology and morphosyntax : the case of Romance causatives", *Linguistic Inquiry*, 16:2, 247-289.