It is well accepted within current generative grammar that adverb positions provide evidence for a more complex clause structure than was previously assumed (e.g. Pollock 1989, Laezlinger 1998, 2002, Cinque 1999). In this view, instead of being adjoined to syntactic categories such as VP, AP etc., adverbs are analysed as specifiers of (or adjuncts to) abstract functional projections, whose identity depends on the semantic class of the adverb. Such functional projections are organised in a (universal) hierarchy which accounts for adverb ordering. Adverbs are generated higher than the verb, and verb movement (or ‘remnant VP’ movement) is used to explain the occurrence of adverbs after as well as before the verb.

We propose an alternative view of adverb distribution, focusing on French adverbs. Like Ernst (1998, 2002), we observe that the hierarchy is too rigid to account for the complexity of the data concerning scope and adverb ordering. In addition, we show that an analysis based on a hierarchy of functional projections misses one of the key properties of adverbs, which is generally overlooked: their syntactic polymorphism. When one looks at their occurrence in different syntactic domains, and not just in the VP and S, the simplicity provided by the hierarchy of functional projections appears illusory. Adopting a phrase structure approach, which does not make use of functional projections or movement, we provide here a general picture of the syntax of French adverbs, by putting together several analyses which we have proposed separately. We distinguish between pre- and post-verbal positioning of adverbs by associating them with two different grammatical functions: they are adjuncts when they precede the head, and complements when they follow it (e.g. Abeillé and Godard 1997, Bouma et al. 2001). Crucially, although they adjoin to various categories, adverbs can only be complements of verbs. On the basis of the verbal projection adverbs can adjoin to, we divide French adverbs into two broad syntactic classes (based on Abeillé & Godard 1997). Adverbs also differ among themselves along another syntactic dimension, that of their weight: adverbs can be ‘lite’ or ‘non-lite’ (Abeillé and Godard 2000, 2001). Finally, the relative ordering between adverbs is accounted for in terms of scope constraints (Bonami and Godard 2003).

Our analysis is formalised in the HPSG framework, which enables us in particular to underspecify the category adverbs adjoin to – thus accounting for adverbs' polymorphism, and provides the right amount of flexibility concerning their ordering with respect to each other as well as with nominal or prepositional complements – thus accounting both for rigid orderings and the scrambling of adverbs of certain classes with complements.
1. Adverbs and Functional Projections
We briefly illustrate two well-known analyses of adverbs as specifiers of functional projections, and point out certain of their problems.

1.1 Pollock (1989) and Cinque (1999)
Starting with Pollock (1989), negative adverbs in French have been analysed as specifiers of NegP (a functional projection headed by ne). Within French, this analysis aims at capturing the fact that the relative position of the verb and the negative adverb (such as pas) depends on finiteness; roughly speaking, the Vinf follows while the finite V precedes the adverb:1,2

(1) a Jean ne lave pas Fido / *ne pas lave Fido.
   ‘Jean does not wash Fido’
   b Jean promet de ne pas laver Fido / *de ne laver pas Fido.
   ‘Jean promises not to wash Fido’

The analysis illustrated in (2) is as follows: negative adverbs (like pas) are always generated to the left of VP; the Vinf optionally moves to an intermediate functional projection Agr while the Vfin obligatorily moves to Tense:

(2) TP
    ┌────────────┐
    │            │
    │           │
    │ NP        │
    │           │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ T         │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ T'        │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ T         │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ Spec      │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ T         │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ NegP      │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ AgrP      │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ Agr       │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ V         │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ VP        │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ NP        │
    │           │
    │ r         │
    │ u         │
    └────────────┘
    │ ↑         │
    │ Fido      │

A similar approach has been subsequently generalised to all adverb classes. Cinque (1999) offers a comprehensive study of adverb distribution in Romance languages, and, more particularly, Italian and French along such lines (see also Laezlinger 1998, 2002). It relies on a universal and very rich hierarchy of functional projections, which is meant to account for adverb scope and ordering.3 As in Pollock, verb movement accounts for the pre- vs post-verbal positions.

Note that the hierarchy of adverbs is meant to cover prosodically integrated adverbs, but not incidental adverbs (those which are not integrated in the clause intonation pattern): Cinque, who recognizes this prosodical distinction,
explicitly intends to leave aside incidental adverbs. However, neither he nor other syntacticians working on French adverbs, such as Laezlinger (2002), are consistent in their practice. For instance, S-initial adverbs are taken into account, while adverbs between the subject and the verb are excluded; but adverbs in both positions are clearly incidental, at least in French (on incidentality, as applied to (French) adverbs, see Bonami et al. 2002). We systematically exclude incidents here; this means that the S-initial position is discarded.  

For Cinque, there are two main classes of adverbs with the following ordering:

(3) Adverb classification and ordering in Cinque (1999, chap1):
   a  “Higher adverbs”:  
      franchement < malheureusement < probablement < peut-être < intelligemment
   b  “Lower adverbs”:
      généralement < pas < déjà < plus < toujours < complètement < tout < bien

These two broad adverb classes are said to be extensionally equivalent to the older distinction between Sentence and VP adverbs (e.g. Jackendoff 1972), but based on the portion of the sentence where the adverb is found in Italian: higher adverbs must occur before the participle and lower adverbs may occur after the participle. This definition must be adapted for French, where some lower adverbs (see section 3.2. below) must occur before the participle; it can be recast in the following way (Bonami et al. 2002): lower adverbs can be found among (nominal and prepositional) complements, while (non-incidental or integrated) higher adverbs, which can follow the verb in French as in Italian, always precede the complements. Note that, with this definition, lower adverbs include not only manner and degree adverbs (as in Cinque), but also, for instance, time, duration and frequency adverbs. Regarding the subsets of adverbs, even the simplified proposal in (3) shows that Cinque breaks the well-accepted semantic classes into smaller ones, distinguishing, for instance between different classes of modals (represented here by probablement and peut-être).

In this approach, for instance, the ordering of souvent (‘often’) before vite (‘fast’) results from the fact that souvent is a specifier for a functional projection (say AsP1) higher than the functional projection (say Asp2) where vite occurs. This is illustrated in (4), where t1, t2 and t3 are the traces of verb movement from the head position of the VP to a higher functional projection:

(4) a  Paul fait souvent vite son travail  
     Paul does often quickly his work
   b  * Paul fait vite souvent son travail  
     Paul does quickly often his work
1.2 Problematic properties of French adverbs

We review some problems related to the hypothesis of a rigid hierarchy of functional projections, which have to do with the relative ordering of adverbs, as well as their position with respect to the V. In particular, it appears that negations do not fit so easily in the model as Pollock and Cinque seem to believe.

1.2.1 Relative order of adverbs

The hierarchical representation of adverbs is based on two hypotheses: adverbs are rigidly ordered and an adverb position determines its scope. Cinque himself notes some difficulties, which he takes to be apparent. But some cases threaten the very basis for the hierarchy. With some pairs, the two adverbs can occur in two orders, with a scope difference. Examples are given in Ernst (2002), Bonami et al. (2002); for instance, adverbs of frequency permute with adverbs of duration, with a scope difference:

(5) a Il s'est longtemps absenté souvent.
   'He was absent for a long time often'
b Il s'est souvent absenté longtemps.
   'He was often absent for a long time'

In addition, there are some adverbs whose permutation does not result in a scope difference; for instance, adverbs of negation and frame adverbs (légalement ‘legally’), or time and modal adverbs (probablement ‘probably’):

(6) a Il n'est pas légalement autorisé à sortir.
   'He is not legally authorized to leave'
b Il n'est légalement pas autorisé à sortir.
   'He is legally not authorized to leave'
If the position of an adverb determines its scope, which itself depends on a hierarchy of functional projections, it is difficult to accommodate the fact that it can appear in different positions. Appealing to an ambiguity of one adverb (which occurs in different functional projections, see Cinque 1999), or to the hypothesis that the same functional projection can appear in different positions (see Laezlinger 2002), is equivalent to denying the empirical basis of the hierarchy.

A second type of problem is revealed when one looks at coordination of adverbs, a difficulty which is also discussed in Ernst (2002). In Cinque's analysis, coordination of adverbs of different classes should not be possible: since they correspond to different functional projections, it is not clear where they should appear. However, coordination of manner and duration adverbs, or of manner and degree adverbs is perfectly natural; in the latter case, in fact, coordination seems obligatory:

(8) a Il a examiné le tableau longtemps et minutieusement
   'He examined the picture a long time and minutiously'
 b Il travaille beaucoup et efficacement
   'He works a lot and efficiently'
 c ??Il travaille beaucoup efficacement

1.2.2 Adverbs outside the verbal domain

The occurrence of adverbs is not restricted to verbal domains. If the occurrence and ordering of adverbs depends on a hierarchy of functional projections, one has to import the complete hierarchy not only in the AP, but also in the PP, and even in the (predicative) NP domain, where they can occur. A few examples of such adverbs in domains other than VP or S are given in (9):

(9) a evaluatives: bizarrement bleu ('strangely blue').
 b modals: probablement ivre/ depuis Paris ('probably drunk / from Paris')
 c agentives: intelligemment partisan des réformes (adept of reforms')
 d frequency adverbs: des collaborateurs souvent ivres, toujours à cheval ('associates often drunk', 'always on horses')
 e negations: des enfants pas peureux, jamais en panne d'idées ('children not fearful', 'never without ideas')
 f frames: globalement positif, légalement en charge de ce dossier ('globally positive', 'legally in charge')
 g time: aussitôt ivre, aujourd'hui président ('immediately drunk', 'today president')
Degree adverbs are specially flexible: in addition to verbs and adjectives, some of them can also modify adverbs and nouns.\(^8\)

\[(10)\]  
- a. Paul leur parle [trop gentiment]  
  ‘Paul talks to them too kindly’  
- b. Paul a [trop peur]  
  ‘Paul has too much fear’  
- c. tellement / assez / trop de pommes / de chagrin  
  so / enough / too of apples / grief

The generalisations concerning word order are identical in all domains. In the adjectival phrase (AP), adverbs of frequency (\textit{toujours} ‘always’) precede degree adverbs (\textit{trop}, \textit{assez} ‘too’, ‘enough’), like in the verbal domain (Abeillé et al. 2002):

\[(11)\]  
- a. Il craint de toujours trop travailler / * de trop toujours travailler  
  ‘He fears to always work too much’  
- b. Des trains toujours trop pleins / * trop toujours pleins  
  ‘Trains always too crowded’

The two possible orders of frames and negations and of modals and times, illustrated in (6)-(7) for verbs, are given in (12) with adjectives and nouns:

\[(12)\]  
- a. Une initiative politiquement non recevable / non politiquement recevable  
  ‘A politically non acceptable initiative’  
- b. Probablement bientôt / Bientôt probablement maire de son village, Paul ...  
  ‘Probably soon mayor of his village, Paul …’

Thus, the analyses based on functional projections completely miss one of the key properties of adverbs: their syntactic polymorphism, that is, the fact that they occur in different syntactic domains.

1.2.3 Order of adverbs and verbs: negations

In the representation of adverb distribution based on functional projections, adverbs have one (preverbal) position while the V can or must move from the head of VP to a higher functional projection, thus accounting for the occurrence of adverbs before or after the V.\(^9\) Such an analysis encounters several problems. We mention three of them: first, the functional projection NegP itself is not well-motivated, and raises at least as many problems as it solves; second, scrambling of adverbs and complements requires other movements besides V movement; third, there are adverbs which can only be postverbal.

The hypothesis of V movement is based on the behaviour of negations in the first place (see section 1.1), but it fails to account for the data. Recall that \textit{ne},
the head of NegP, is said to move to a higher functional projection (say, T in (1)) because of its clitic status. However, it is not clear what the position and status of ne are with an infinitival, since it occurs on the first word of the phrase, adverb or Vinf. The clitic ne must move to a higher functional projection, since it occurs before the negative adverb (which is generated to its left), but this cannot be a position dedicated to clitics, since ne can be separated from pronominal clitics by a (non clitic) adverb (13a). The only solution is to postulate a special functional projection for infinitives with no independent justification. Moreover, NegP itself, as a projection which dominates both ne and a negative adverb, is justified in so far as it accounts for the co-occurrence of the negative adverb with ne. But there is a notable exception to this co-occurrence: while the adverbs aucunement and nullement co-occur with ne when they are post-verbal, they are incompatible with it when they are preverbal, as shown by the contrast between (13b) and (13c) (Abeillé and Godard 1997); (13d) is allowed because sans takes a VP without ne. If these (negative) adverbs are not generated in the specifier of NegP, then what is the justification underlying NegP?

(13) a  Il avoue ne pas sérieusement le lire.
He recognises (to) NE not seriously it read (= ‘not to read it

b  * Paul veut n’aucunement leur nuire.
Paul wants NE in no way them harm

c  Paul ne leur nuit aucunement.
Paul NE harms them in no way

d  Il a fait son devoir sans (*n’) aucunement leur nuire.
He has done his duty without in no way harm them

Another major problem with NegP is that negative adverbs can occur postverbally even with Vinf, and scramble with complements: this is the case for aucunement, nullement and also jamais, plus when they are modified or conjoined (Abeillé and Godard 1997).10

(14) a  Paul ne voit son frère *(pratiquement) plus.
‘Paul does not see his brother (almost) any longer’

b  Paul ne voit son frère *(jamais ou presque) jamais.
Paul sees his brother never or almost never

c  Paul veut ne leur nuire aucunement.
‘Paul wants to harm them in no way’

d  Paul veut ne voir son frère jamais ou presque jamais.
Paul wants to see his brother never or almost never

To account for (14c,d), one must suppose that the Vinf can move to a functional projection higher than negation, which dramatically undermines the whole analysis. In addition, scrambling must be accounted for either by letting nominal complements move to the left of negative adverbs, or adverbs move to the right of complements. Alternatively, NegP can be said to host only the negative adverb pas, since pas does not scramble with complements. But the relative order of negative adverbs and other adverbs is the same: ‘higher
adverbs’ (when non-incidental) precede negative adverbs in a general way, while other adverbs (such as manner and degree adverbs) follow them. Thus, either the ordering of adverbs among themselves can be captured independently of the hierarchy of functional projections or functional projections must be multiplied ad libitum.

(15) a Paul n’ir a probablement pas / jamais à cette conférence.
   ‘Paul will probably not / never go to this conference’

b *Paul n’ira pas / jamais probablement à cette conférence.

c Paul ne va pas beaucoup au cinéma.
   ‘Paul does not go often to the cinema’

d *Paul ne va beaucoup pas au cinéma.

Finally, it should be mentioned that Pollock’s analysis does not extend to other Romance languages such as Italian or Rumanian. If the negative adverb (non, nu) is the head (or the specifier) of a functional projection taking VP as complement, it should have wide scope over a coordination of VP, which is not the case. While (16a) is grammatical, the second conjunct is not semantically negative, and (16b) is ungrammatical:

(16) a I Paolo afferma non leggere giornali o/e guardare le notizie in televisione.
   ‘Paolo pretends not to read newspaper and to watch the news on TV’

b R Pentru a nu citi ziarul sau/i a *(nu) se uita ºtirile la televizor, ...
   ‘In order to not read the newspaper or/ and watch the news on TV’

1.2.4 Order of adverbs and verbs: the general case

Scrambling of adverbs and complements is not a property of negative adverbs but characterizes the class of ‘lower adverbs’ (as defined above: it includes manners, degrees, time, duration and frequency adverbs). Accordingly, the problem of getting the different possible orders is more general. Not only the verb, but also complements and / or adverbs of certain classes move. Although this mechanism is well accepted in certain grammatical formalisms (see e.g. Ernst 2002, Laezlinger 2002), it creates unmotivated complications in the syntax.

(17) a Paul verra son frère plus souvent.
   ‘Paul will-see his brother more often’

b Paul fait ses devoirs efficacement / intelligemment.
   ‘Paul does his homework efficiently / intelligently’

Finally, there are adverbs which are always postverbal. Manner adverbs with a result interpretation (verticalement ‘vertically’, horizontalement ‘horizontally’, spacieusement ‘spaciously’, mortellement ‘mortally’) are one case (Abeillé and Godard 2002b). For certain speakers, this is also true for a larger subclass of
manner adverbs (*bruyamment*, ‘noisily’, *attentivement*, ‘attentively’, Bouchard 1995, Abeillé and Godard 1997). This means that V movement is in some cases obligatory. But how can movement of Vinf be made dependent on the adverb class (see also Kim & Sag 2001)?

(18) a ??Il avait promis d’élégamment s’habiller pour cette soirée.
    He had promised to elegantly dress himself for the party
b Il avait promis de s’habiller élégamment pour cette soirée.
c ??Elle s’était engagée à spacieusement installer le personnel
    She had committed herself to spaciously accommodate the staff
d Elle s’était engagée à installer spacieusement le personnel.

To summarize, the ordering and scope properties of adverbs raise a number of difficulties for the hypothesis that they are specifiers in a hierarchy of functional projections. The solutions that have been or can be offered are the following: (i) allowing adverbs of some classes to occur in several positions; (ii) allowing for ‘pied-piping’, where, instead of V or ‘remnant VP’ movement, it is a functional projection including an adverb, and dominating the VP, which moves; (iii) allowing for movement of complements (and / or adverbs) in addition to movement of verbal projections; (iv) duplicating the hierarchy (or part of it) in syntactic domains other than the sentence. They are problematic: these analyses are not independently justified, and threaten the empirical basis of the proposal. In addition, it is difficult to see how the coordination data and the obligatory postverbal positions of some adverbs can be integrated in this analysis.

2. Background

We present an alternative analysis that makes no use of functional projections or verb movement to account for adverb positions. We implement our analysis in Head-driven Phrase Structure Grammar (HPSG), a lexicalist model making crucial use of feature structures which can be underspecified. Under-specification is useful to account for the syntactic polymorphism of adverbs, and for the scrambling of adverbs and complements.

2.1 Head-driven Phrase structure grammar

Head-driven Phrase Structure Grammar (HPSG; Pollard & Sag 1994, Sag, Wasow & Bender 2003) defines a grammar as a set of (well-formedness) constraints on linguistic signs (which can be words or phrases). Linguistic signs are modeled with typed-feature structures, combined by unification. The main features of a sign are as in (19):11
Main features of a sign in HPSG

MOTHER PHON for phonological information
SYNSEM CAT for syntactic features
CONT for semantic features
CTXT for contextual information
DAUGHTERS for features associated with immediate constituents

Like Lexical Functional Grammar, HPSG makes use of grammatical functions, which are present as valence features on predicates on the one hand, and as daughters in several types of phrases, such as head-complements-phrase, head-subject-phrase, head-specifier-phrase, head-adjunct-phrase. Thus, a phrase is a well-formed head-complements-phrase if it dominates a (lexical) predicate (the head daughter, that is, the expression that is the value of the HEAD-DTR feature) and the complements it selects for (the non-head daughters, or the list of signs that are the value of the COMPS feature). Note that the head of the sentence is the VP, and the head of VP is the V: the syntactic unit being the fully inflected word, there is no functional category (such as Infl, or Agr) which does not correspond to a word.

We make crucial use here of head-complements-phrase and head-adjunct-phrase, whose description is given in (21). Among syntactic features are the HEAD features, which are always shared by a phrase and its head daughter. More generally, a phrase and its head daughter share their features, except for those which are specified to be different by the specific description of more specific phrases, see the Generalized Head Feature Principle in (20) (Ginzburg & Sag 2000: 33), where the ‘/’ sign indicates that the identity is by default and can be violated by constraints on more specific types. For instance, the head-complements-phrase (the mother) and its head daughter share their features except for the complements: the predicate requires the presence of complements, while the phrase is normally saturated for them. A sign can be an adjunct in a head-adjunct-phrase if it bears a MOD value (a HEAD feature) whose value is identical to the synsem (syntactic and semantic features) of the head daughter (for the weight feature in (21a), see sections 2.2, 3.1.2).

Generalized head feature principle (GHFP)

headed-phrase =>

\[
\begin{array}{c}
\text{MOTHER}\mid \text{SYNSEM} / \square \\
\text{HEAD-DTR}\mid \text{SYNSEM} / \square \\
\end{array}
\]

(21) a head-complements-phrase =>

\[
\begin{array}{c}
\text{MOTHER} \sqcup \text{COMPS} < > \\
\text{HEAD-DTR} \sqcup \text{COMPS-DTRS} \\
\end{array}
\]
These descriptions do not refer to the category of the daughters, nor to their ordering. It is the lexical predicates which syntactically and semantically specify which complements they require. Ordering is taken care of by independent principles, which, because ordering is due to the interaction of different factors, can refer to various features of constituents: their function, category, meaning etc. General ordering constraints on the daughters of the different phrase types (here, the head-subject-phrase, the head-complements-phrase and the head-adjunct-phrase, respectively) valid for French are given in (22), where ‘A precedes B’ indicates that an expression with property A precedes an expression with property B; ‘Subject-Daughter’ etc. notes the expression that is the value of the feature SUBJ-DTR etc. Note that constraint (22c) orders adverbs before the head they modify.

(22) a head-subject-phrase => Subject-Daughter precedes Head-Daughter
b head-complements-phrase => Head-Daughter precedes Complement Daughter
c head-adjunct-phrase => Adjunct-Daughter [ADV +] precedes Head-Daughter

Regarding the syntax-semantics interface, we adopt ‘Minimal Recursion MRS, Copestake et al. 2003). The units of meaning are elementary predications, or relations with their arguments (e.g. read(x,y)) associated with words, into which expressions are decomposed. Crucially, the constraints on the combination of the units are dissociated from the syntax, although they take syntax into account. Each predication is associated with a label or ‘handle’ which serves as a pointer, and, in a well-formed structure, this handle is either identified with the highest handle for the sentence or with that of an argument of another relation. Scope properties (of items or of phrases) are represented by conditions on handles. At each syntactic node, predications and constraints on their combination (expressed in terms of handle relations) accumulate (relations are said to form a ‘bag’, or multiset).

Dissociating predications and the combinatorics allows for a certain flexibility: the combination of units can take into account not only the syntactic structure, but also scopal properties of the lexical items (notably quantifiers and adverbs), and the context (as in the case of multiple quantifiers, or of multiple adverbs at the same syntactic level). The ambiguity of certain sentences is represented by underspecification (not all handles are identified with that of an argument), but, in a well-formed representation, ambiguities are resolved. Crucially in the case of adverbs, lexical items can take scope higher than the syntactic node of which they are a part, and the (relation associated with the) syntactic head (for instance, the lexical V in the VP) is not necessarily the element which is semantically the highest in the phrase.
Main features in an mrs structure

L-TOP handle of the element which has the highest scope in its phrase.
INDEX variable associated with an element in the domain of entities (objects or events).
RELS ‘bag’ of predicative relations associated with a word or a phrase.
HCONS list of scope conditions, stated as relations between handles.

In a phrase, the relations associated with words, as well as the scope conditions, simply accumulate. The index, and the KEY, a distinguished relation which plays a crucial role for selection purposes, are shared between a phrase and its semantic head (which is also the syntactic head in a head-complements-phrase, but not in a head-adjunct-phrase).

A simple example of a representation (not involving scopal arguments) associated with the sentence Jo watches Pat, is given in (24). As usual, ‘i’, ‘j’ etc. are indices for objects, ‘e1’, ‘e2’ etc. for events, and ‘h1’ etc. are pointers for handles; two identical tags (such as [1] ) or indices must be identified.
2.2 The syntactic weight feature

It is well-accepted that the weight of constituents plays a role in syntax, particularly regarding word order (see e.g. Hawkins 1994, 2000, Wasow 1997). Since this dimension plays a role in the syntax of adverbs, let us briefly present our theory (Abeillé & Godard 2000), and compare it to the way it is used in other studies of adverbs.

A general theory of weight takes into account not only heaviness phenomena (such as heavy NP shift), but also properties due to lightness. There is a shared intuition regarding word order (explicit in e.g. Alexiadou 1997, Abeillé and Godard 2000, Ernst 2002), such that light elements tend to cluster close to the head, while heavy constituents tend to occur further from the head. However, the theories or analyses differ on two points: the role played in the grammar by weight, and lightness in particular, and the definition of light constituents. While it is usual to consider that weight is a factor in determining word order, in our theory, it plays an important role in other parts of the syntax (constraints on phrases, on subcategorisation). More precisely, heaviness and lightness are not parallel. While heaviness effects seem to be restricted to word order, and be a matter of preferences rather than strict constraints, the role of lightness is grammaticalised, at least in a number of languages, French among them. Thus, it plays a role in syntax besides word order effects, and determines strict constraints. Accordingly, we restrict ourselves to the light vs non light distinction, leaving matters of heaviness aside. The second point is not always directly addressed, so for comparison we must rely on occasional observations rather than full fledged theories. The behavior of light elements is usually noticed regarding adverbs; this contrasts with Abeillé and Godard (2000), where the weight property is cross-categorial. In fact, lightness is for us a type of syntactic deficiency (which we dub ‘liteness’, to distinguish it from semantic lightness, and light verb constructions). In addition, it is usually implied that it is a property of words (Alexiadou 1997, Ernst 2002, Laezlinger 2002), while, in our approach, it is a property both of words and phrases (not all phrases are non-lite, although most are).

We illustrate our theory with nominal complements, leaving the properties of adverbs for the analysis below. Lite items (or expressions) have three defining properties: (i) they cannot scramble with phrasal complements (NP or PP) of the same head, (ii) they cannot be extracted, and (iii) when they adjoin to a lexical (or lite) head, the phrase may have liteness properties. Support verbs (or verbs in light verb constructions) may accept both a bare N or an NP. We analyse bare common nouns in French as *lite*, and NP, as well as proper names, as *non-lite*. The contrast between bare N and proper names shows that the absence of scrambling is not a matter of word vs phrase.

(25) a  Jean rendra hommage aux victimes.
          ‘Jean will pay tribute to the victims’
   b  * Jean rendra aux victimes hommage.

(26) a  Jean rendra aux victimes un vibrant hommage.
          ‘Jean will pay a special tribute to the victims’
   a'  Jean rendra un vibrant hommage aux victimes.
Jean présentera Jean-Marie à chacun.

b Jean présentera Jean-Marie à chacun.

‘Jean introduces Jean-Marie to every (one)’

b’ Jean présentera Jean à chacun.

Liteness cannot be reduced to other properties. First, it is different from syntactic incorporation: a lite bare N can be passivised, and, as an object, it can be separated from the V by adverbs.

(27) a C’est [un vibrant hommage] que le Président rendra aux victimes.

‘It is a special tribute that Jean

b* C’est hommage que le Président rendra aux victimes.

It is tribute that the President will pay to the victims

Second, this special behaviour is not related to the absence of a determiner: these elements behave like ordinary phrases if they are modified or coordinated. They can scramble and can be extracted:

(28) a Hommage sera rendu aux victimes.

‘Tribute will be paid to the victims’

b Le Président rendra probablement hommage aux victimes.

The president will pay probably tribute to the victims

The fact that lite elements can be modified or conjoined also shows that liteness should not be confused with ‘weakness’ as defined by Cardinaletti & Starke (1994); rather, both types of behaviour can be seen as facets of a more general category, that of ‘deficiency’.

This is why we define a special property ‘liteness’. Regarding the order of constituents, the intuition is that lite constituents are found close to the head (although not obligatorily adjacent to it), in a way analogous to heavy constituents which are found far from the head. More formally, we propose to add the feature WEIGHT to the ontology of syntactic features. Its value weight is further specified either as lite or non-lite, and is taken into account by different aspects of syntax (word order, adjunction sites, extraction).

Weight distinguishes both among lexical items and phrases. The weight of lexical items is defined, in each language or language type, for classes (common N are lite and proper names are non-lite in most Romance languages) or subclasses of items. Phrases in a general way are non-lite; exceptions are, in French, coordination or adjunction involving only lite daughters (which behave either as lite or non-lite).
2.3 Definition of adverbs

Like other part-of-speech or syntactic categories, that of ‘Adverb’ is difficult to define, because different types of criteria interact. We use a distributional criterion, which is sufficient and nearly (but not exactly) necessary.\(^{15}\)

Regarding morphology, the presence of suffix -\textit{ment} on an adjectival base is sufficient but not necessary to define adverbs (see adverbs such as \textit{soudain} ‘sudden(ly)’, \textit{souvent} ‘often’); on the other hand, absence of agreement may be a necessary but not a sufficient criterion (see the N \textit{standard} in \textit{des conventions standard} ‘standard agreements’). While it is true that adverbs are semantically modifiers rather than arguments, this is insufficient to define them since, of course, other expressions (such as PP) can be modifiers. We propose a purely distributional property (Bonami 1999): only adverbs can occur (with integrated prosody) between the tense auxiliary and the past participle.\(^{16}\)

Consider the contrasts illustrated in (30). The adverb \textit{gentiment}, but not the roughly equivalent PP \textit{d’une manière gentille}, occurs in this position (Sportiche 1994); similarly, the adverb \textit{souvent} is allowed, not the NP \textit{trois fois}, although they share some syntactic (the NP can be an adjunct, as in \textit{Trois fois, il a trahi son maître} ‘Three times, he betrayed his master’) and semantic (they are frequency expressions) properties.

\begin{align*}
\text{(30) }&\text{a Paul a gentiment lu le journal à sa grand-mère.} \\
&\text{‘Paul has kindly read the newspaper to his grand mother’} \\
&\text{b* Paul a d’une manière gentille lu le journal à sa grand-mère.} \\
&\text{Paul has in a kind way read the newspaper to his grand-mother} \\
&\text{c Paul a souvent accompagné son fils à l’école cette semaine.} \\
&\text{‘Paul has often brought his son to school this week’} \\
&\text{d* Paul a trois fois accompagné son fils à l’école cette semaine.} \\
&\text{Paul has three times brought his son to school this week.}
\end{align*}

Note that the criterion operates only for non-incidental adverbs; accordingly, the property is irrelevant for those adverbs which are always incidental (that is, speech act adverbs, Bonami and Godard 2003).

This property is helpful for determining the part of speech of disputed cases. We give some examples. Degree words such as \textit{beaucoup} ‘a lot’, \textit{trop} ‘too(-much)’, etc. are clearly adverbs, while locative or temporal words such as \textit{ici} ‘here’, \textit{demain} ‘tomorrow’, which are often considered adverbs, fail the test and are better analysed as PP and NP.

\begin{align*}
\text{(31) }&\text{a Paul a beaucoup/ trop dansé.} \\
&\text{Paul has a-lot/ too-much danced} \\
&\text{b Paul a dansé ici/ dans cette pièce.} \\
&\text{‘Paul has danced here / in this room’} \\
&\text{b* Paul a ici/ dans cette pièce dansé.} \\
&\text{c Paul aura fini demain.} \\
&\text{‘Paul will have finished tomorrow’} \\
&\text{c* Paul aura demain fini}
\end{align*}
In addition, -ment adverbs differ from their adjectival counterparts when they exist precisely with this property. Lourd ‘heavy’ can modify certain verbs, like the adverb lourdement ‘heavily’, but fails to occur between the auxiliary and the past participle (Abeillé and Godard 2002a). This shows that lourd is an adjective, even when it is used as a verb modifier, and has an invariant form:

(32) a Cet événement a pesé lourd/ lourdement sur l’économie.
   This event has weighted heavy / heavily on the economy
b Cet événement a lourdement pesé sur l’économie.
   ‘This event has heavily weighted on the economy’
c * Cet événement a lourd pesé sur l’économie.
   This event has heavy weighted on the economy

Finally, the quantifiers tout, rien, tous occur in this position (33a). This is not the only property which they share with adverbs, since they can adjoin to a verb (33b), in addition to occurring in nominal positions (see (33c), for instance). In other words, such quantifiers are both nominal and adverbial (see Kayne 1975, Abeillé and Godard 1999). This intuition can be formalised in different ways, either by giving them a mixed category inheriting both from nouns and adverbs (on mixed categories, see Malouf 2000), or a category ‘noun’, enriched with a feature \[\text{ADV}\], which they share with adverbs. We adopt the second solution here.

(33) a Il a tout préparé / Il les a tous vus.
   He has all prepared / He them-has all seen
   ‘He as prepared everything’, ‘He has seen them all’
b Il est temps de tout préparer.
   It is time to all prepare (= ‘to prepare everything’)
c Je m’adresserai à tous.
   I will speak to all

3. The Dual function of adverbs

We account for the different positions of adverbs with respect to verbs, by attributing them two grammatical functions: preverbal adverbs are adjuncts, while postverbal adverbs are complements, following e.g. Abeillé and Godard (1997), Bouma et al. (2001).17

3.1 Adverbs as adjuncts

3.1.1 The syntax of head-adjunct phrases

As adjuncts, adverbs must meet the description of the head-adjunct-phrase, given in (21b). Adjuncts select the head they adjoin to via the feature MOD, whose value matches (unifies with) the synsem of the head. As mentioned above (see section 1.2.1), adverbs are polymorphic: they can adjoin to heads belonging to different parts of speech. For instance, a frequency adverb such
as *souvent* is not specialised for verbal projections, as is often assumed, but can adjoin to AP, PP, or (predicative) NP. In (34a), it adjoins to an infinitival VP, in (34b) to an AP, and to a PP in (34c). Adjunction to an NP depends on whether it is predicative or not (34d,e).

(34)  
a On lui reproche de souvent partir avant l'heure.  
He is blamed for often going away before the time.

b Souvent malade, cet enfant ne pouvait aller à l'école.  
Often sick, this child could not go to school

c Souvent en avance sur son époque, ce médecin était incompri.  
Often in advance of his time, this doctor was not understood

d Souvent maire de son village, il connaissait tout le monde.  
Often the mayor of his village, he knew everybody

e * A cause de souvent l'inondation de cette ville / * A cause de l'inondation de cette ville souvent, on doit revoir les berges du fleuve.  
Because of often the flooding of this town/ Because of the flooding of this town often, the banks must be repaired

This strongly suggests that selection of the head by the adverb is done on a semantic rather than syntactic basis. In this respect, we agree with semantically based theories of adverb positions, such as Ernst (1998, 2002), Shaer (1998). The data follow if a frequency adverb takes as argument an expression denoting a property (of events or of individuals); for instance, the NP in (34e) denotes an event, while the NP in (34d) is associated with a property (of individuals). We assume here that no syntactic constraint is necessary, and adverbs may completely underspecify the part of speech of the head they adjoin to.

This does not mean that there are no syntactic constraint on adverb adjunction. French adverbs very generally cannot adjoin to a finite verbal projection (finite VP or S/IP) if they have an integrated prosody (Bonami et al. 2002, Marandin 1997). This is illustrated with *souvent* and a manner adverb in (35), where incidental and integrated prosodies are noted by the presence or absence of comma:

(35)  
a Souvent *(,)* Paul part en retard pour le train.  
Often, Paul leaves home late for his train

b Paul *(,)* calmement *(,)* a décroché le téléphone.  
Paul, calmly, answered the phone

If incidental adverbs are analysed as adjuncts, then, adjunction to finite verbal projections is possible, but restricted to incidentals. Assuming a syntactic (head) feature [INCID ±], related to prosody (Bonami and Godard, 2003), we describe the data in (35) with a general implicational constraint on the head-adjunct-phrase; this allows further underspecification for adverbs. Constraint (36) says that, if the head daughter in a head-adjunct-phrase is headed by a finite V, then, the adjunct must be incidental.18
3.1.2 The ‘liteness’ property

Let us turn to the dimension of weight. There is a class of lite adverbs (call it the ‘beaucoup class’), which contrast with non-lite ones. This is a lexical property; morphology plays a role, since -ment adverbs are non-lite (except for a very few adverbs such as vraiment ‘really’, where the sense of the derivation is lost), but not all non-lite adverbs are -ment adverbs (see souvent ‘often’, parfois ‘sometimes’). We show that lite adverbs and only lite adverbs can adjoin to the left of the lexical V (Abeillé & Godard, 1997, 2000, 2001).

Adverbs of the ‘beaucoup’ class, which are degree or manner adverbs (bien ‘well’, mal ‘badly’, beaucoup ‘much’, peu ‘little’, trop ‘too-much’, vraiment ‘really’, presque ‘nearly’, etc.), occur to the left of the Vinf, like most adverbs. However, unlike the others, they do not have scope over a conjunction of VPs. We illustrate the contrast in (39) and (40), with the lite adverbs trop ‘too-much’ and tous ‘all’ (on the adverbial properties of tous, tout and rien, see section 2.3), and the non-lite ones souvent ‘often’ and complètement ‘completely’.
(39)  

(a) On lui reproche de trop aller au cinéma.
They blame him of too(-much) go to the movies

(b) * On lui reproche de trop aller au cinéma et négliger son travail.
They blame him of too(-much) go to the movies and neglect his work

(c) On lui demande de tous les lire avant demain.
They ask him to all read them before tomorrow

(d) * On lui demande de tous les lire avant demain et vous les résumer.
They ask him to all read them before tomorrow and summarise them to us

(40)  

(a) ? On lui reproche de souvent aller au cinéma et négliger son travail.
They blame him of too(-much) go to the movies and neglect his work

(b) % On lui demande de complètement nettoyer la maison et la fermer.
They ask him to completely clean the house and close it

To explain why adverbs of the ‘beaucoup’ class fail to have wide scope over a conjunction of VPs, there are two possibilities: either they ‘incorporate’ into the V, forming a sort of compound, or they adjoin to the lexical V, and cannot adjoin to VP. The first solution, suggested by Laezlinger (2002) cannot be adopted for the general case. It encounters the following problems: (i) they can in general have scope over a conjunction of lexical V’s (41), and (ii) they can conjoin among themselves and still occur to the left of Vinf, without having wide scope over a conjunction of VPs (42).

(41)  

(a) ? On lui reproche de trop danser et s’amuser.
They blame him of too(-much) dance and have-fun

(b) ? Il faut du temps pour tous les lire et vous les résumer.
One needs time to all read them and summarise them to you

(42)  

(a) Il passe sa vie à trop ou trop peu travailler, alternativement.
He spends his life too much or too little working, alternatively.

(a’) * Il passe sa vie, alternativement, à trop ou trop peu travailler et s’occuper de sa famille.
He spends his life, alternatively, to too(-much) or too little work and take care of his family

(b) Il promet de tous ou presque tous les lire pour demain.
He promises to all or nearly all read them for tomorrow

(b’) * Il promet de tous ou presque tous les lire avant demain et vous les résumer
He promises to all or nearly all read them before tomorrow and summarise them to you

Accordingly, we analyse their occurrence to the left of Vinf as adjunction to the lexical V. Correlatively, we show that such adverbs are lite: they do not scramble with NP or PP complements, unless they are modified or stressed, and fail to be extracted (clefted):
We conclude that lite degree and manner adverbs (the ‘beaucoup’ class) can adjoin to the lexical (lite) V and not the VP, while non-lite ones such as *souvent, excessivement* and *correctement*, can adjoin to VP. In addition, we must show that non-lite adverbs do not adjoin to the lexical V.

To see this, recall that *tous* is lite and adjoins to the lexical V; if non-lite adverbs could adjoin to the left of a lexical V, they should be able to intervene between *tous* and the V. But this is not the case. Note that the unacceptability of (46a,b) cannot be ascribed to a scope violation: there is no reason why the quantifier should not be able to have scope over the frequency adverb, as it does in (46c).

(46) a * Il se réjouit de tous souvent les voir.
   He is delighted of all often see them
   b Il se réjouit de (souvent) tous les voir (souvent).
   He is delighted of (often) all see them (often)
   c Il les a tous souvent relus.
   He has all often reread them

Thus, lite degree and manner adverbs adjoin to the lexical V, not to VP, while non-lite adverbs adjoin to VP, not to the lexical V. This does not mean that there is a general weight constraint on adjunction such that the adjunct and the
head are of the same weight. For instance, negative adverbs, which are lite, adjoin to the VP, not to the lexical V (see below section 5). Thus, it appears that adverb (classes) specify the weight of the head they adjoin to.

Let us go back to the adverbs which are always post-verbal (see (18)). Since we analyse postverbal adverbs as complements, their behaviour would follow if they had no MOD specification. But not only would this specification be strange, since adverbs in a general way can be adjunct (and, thus, have a non-empty MOD feature), it would be false: these adverbs can adjoin to the left of other non-finite or adjectival expressions as in Spacieusement installé, le personnel était plus efficace ‘Spaciously accommodated, the staff was more efficient’. We propose the following analysis: such adverbs are in principle allowed to adjoin to a lexical V; however, this potentiality cannot be realised, because the head-adjunct-phrase would violate ordering constraints.

In addition to constraint (38), which states that adjoined (non-incidental) adverbs occur to the left of the head they modify, we propose a second constraint on the head-adjunct-phrase (47a) such that a lite V precedes a non-lite expression. Together, constraints (38) and (47a) create a conflict which prevents a non-lite adverb from adjoining to the lite V: if the non-lite adverb is adjoined to the left of the lite V, (47a) is violated, and, if it is to the right of the lite V, (38) is violated. Hence, no adjunction of a non-lite adverb to a lite V can give an acceptable head-adjunct-phrase.

\[
\begin{align*}
(47) & \ a \ \text{head-adjunct-phrase} & \Rightarrow & \ [\text{lite V}] \ \text{precedes} \ [\text{non-lite}] \\
 & \ b \ \ [\text{MOTHER} \ [\text{lite}]] & \Rightarrow & \ \text{DTRS list} \ ([\text{lite}]) \\
\end{align*}
\]

Finally, let us go back to the description of the head-complements-phrase given in (21a): the head of such a phrase is lite. This constraint is fulfilled if the head is a word, but also if it is a ‘lite modification’, that is, a word (such as a lexical V) modified by a lite adverb, or a ‘lite coordination’, that is, a lite expression conjoined with a lite expression. Accordingly, the lexical head of a VP, or of an NP, can be modified by a lite adjunct, or can be conjoined with another lexical head. In fact, it is a general constraint on lite phrases that they be made of lite daughters (47b). In this analysis, trop aller in (39a) or trop danser et s'amuser in (41a) are lite phrases.

### 3.1.3 Scope and adjunction

We turn to the constraints on the ordering of adjoined adverbs. Following Bonami et al. (2002), pairs of adverbs represent three cases: (i) there is one possible ordering; (ii) there are two orderings, which correlate with a scope difference; (iii) there are two orderings, with no noticeable difference in scope. Case (i) is illustrated, for instance, by evaluatives (malheureusement ‘unfortunately’, bizarrement ‘strangely’), which, as is well-known, precede other adverbs (except for time adverbs and connectives), see (48). Case (ii) is
illustrated, for instance, by frequency and duration adverbs (see (5) above), and case (iii) by frames and negation (see (6) above).
(48) a Il se réjouit de vraisemblablement oublier complètement cet incident.
    He is pleased of probably forget completely the incident
b * Il se réjouit de complètement oublier vraisemblablement cet incident.

Regarding adjunction, this situation follows in part from two well-accepted hypotheses, which are stressed in semantically oriented approaches to adverb ordering (e.g. Ernst 1998, 2002, Shaer 1998): (a) an adjunct has scope over the head it modifies, and (b) the argument of an adverb belongs to one of a few semantic types, which constrain their distribution indirectly. Note that there is no one-to-one correspondence between syntactic categories and semantic types, but type lifting mechanisms which give the required flexibility for the syntax-semantics interface. For instance, evaluative and modal adverbs take a propositional argument, while manners take an event argument (the event associated with the verb in a Davidsonian approach). Since a simple declarative sentence expresses the proposition that a certain event occurs, the event description provided by a manner adverb can take scope inside the propositional argument of the evaluative or modal. But there is no semantically coherent way for a modal to take scope ‘inside’ the argument of a manner adverb. Similarly, it is expected that pairs of adverbs of type \(<x,x>\) (which take an argument of type \(x\), and give a semantic object of type \(x\), whatever ‘\(x\)’ is) can occur in different orders with a scope difference, as in (49) with frequency and duration adverbs.

(49) a Longtemps souvent parti, il n’avait guère de vie de famille.
    For-a-long-time often gone away, he had not much of a family life
b Souvent longtemps parti, il n’avait guère de vie de famille.
    Often for-a-long-time gone away, he had not much of a family life

It is clear that semantic constraints are at work, even though such hypotheses are insufficient to account for all the observations, and more work needs to be done (see Bonami et al. 2002 for some discussion). We turn to scope constraints proposed in mrs, which can be thought of as the grammaticalisation of semantic constraints (that is, constraints that have consequences on the construction of an interpretive model), but can be stated in purely combinatorial terms.

First, we state (following Pollard and Sag 1994) that an adjunct has scope over the head, and, to speak roughly, takes as argument the content of the head.\(^2\) This is obtained by the two following specifications: the LTOP of the head-adjunct-phrase is equated with that of the adjunct (recall that the LTOP value for a phrase is that of the node with the highest scope in the phrase), and the argument of the adjunct is equated with the LTOP of the head. Crucially, since the element with the highest top in the head phrase does not have to be that of the syntactic head, this allows for the occurrence of adverbs modifying the syntactic head (and sisters to it) to be in the scope of the adjunct. The sign ‘+’ notes concatenation of lists.
Adverbs are associated with one relation only; however, since the constraint applies to head-adjunct phrases generally, we leave open the possibility that the adjunct may contain several relations, focusing here on the key, that is, the relation associated with the semantic head of the adjunct daughter.

We illustrate scope constraints associated with the head-adjunct-phrase with the VPinf of example (49a), where each of the two adverbs may have scope over the other: no scope constraint is imposed by the semantics on the adverb pair, but a constraint comes from the syntactic phrase, which resolves what is left unspecified by the semantics of the adverbs.
3.2 Adverbs as complements

3.2.1 A Lexical Rule extending the argument structure of verbs

It is well known that adverbs (specially manner adverbs) can be subcategorised for by a verb (52). Following e.g. Abeillé & Godard (1997), Bouma et al. (2001), we extend this grammatical function to all (integrated) adverbs in post-verbal position.

(52) a Jean se conduit *(bien / correctement)
Jean behaves well / correctly
b Marie traite son frère *(correctement)
Marie treats her brother correctly

We propose that a lexical rule (LR) can apply to verbs, extending their argument structure to include a number of adverbs (54), if the V has the same specifications regarding head features and key relation that such adverbs require of the verbal projection (V or VP) which they modify (see Bouma et al. 2001). The syntactic effect of the rule is illustrated in (53), where the branches are annotated with the function of the expression (C is for complements).
Two examples of adverbs as complements

We describe the LR in (54). The rule inserts integrated (non- incidental) adverbs (see the specification [INCID –]) one by one into the list of arguments of the verb. The argument structure of a predicate is specified in the lexicon: both the basic verb lexeme (with the minimal argument structure) and the extended one are part of the lexicon. The first argument projects onto a subject and the others onto complements by a general mapping constraint. Accordingly, the adverbs are projected onto complements in the syntax. The features of the V mentioned in the MOD value ensure that the verb cannot take as complements adverbs which would be incompatible with modifying this verb, and that semantic selection is observed for those adverbs which impose selectional restrictions.

There are few adverbs which do not combine with a verb; well-known cases are très, si ('very', 'so'); they are correctly excluded as complements. We have already discussed the problem of those adverbs which are always post-verbal, that is, in our analysis, always complements (see section 3.1.1). At first sight, they present a difficulty for rule (54), since they seem to be complements without being adjuncts; as we have seen, we can account for their not showing up as verb modifiers by appealing to independent properties (the interaction of their non-liteness with ordering constraints). As regards semantic selection, we note that some adverbs impose restrictions. Thus, manner adverbs modify a relation which implies agentivity, and degree adverbs must find a scale as a
component of their argument’s meaning (e.g. Kennedy 1999, Kennedy and McNally 1999).

For a basic verb (with no modifier among the complements), the LTOP is equated (modulo an intervening quantifier) with the handle associated with its KEY relation. The semantics of the extended verb is updated as follows: the adverb has scope over the verb (it takes as argument the LTOP associated with the verb), and the LTOP of the augmented verb is equated with the LTOP of the added adverb (modulo an intervening scoping quantifier, a possibility noted by condition \( q \)). Given this, the next adverb inserted in the argument list must have scope over the adverbs already included. Thus, the inclusion of adverbs takes into account the possible scope constraints among adverbs.

### 3.2.2 Ordering Constraints in the VP

Relative scope among adverbs is directly relevant for the ordering of postverbal adverbs: an adverb which has scope over another one occurs to its left. The solution for preverbal adverbs (and, more generally, for adverbs which precede the head they modify) directly follows from a constraint associated with the head-adjunct-phrase. The relative ordering of postverbal adverbs must now be constrained. We take scope properties to be lexical properties of adverbs, which are taken into account both by the head-adjunct-phrase, and by ordering constraints among sisters in the VP. We adopt the following constraint on the VP (which is a head-complements-phrase), associating the ordering of adverbs with a scope constraint:

\[
\text{head-complements-phrase} \Rightarrow \begin{cases} 
\text{adverb KEY|ARG 1} \text{ precedes adverb LTOP 1} 
\end{cases}
\]

In addition, as we have indicated above (see section 1.1), the distinction between higher adverbs and lower adverbs is important for ordering in the VP: higher adverbs are those adverbs which are constrained to occur before the nominal and prepositional complements, while lower adverbs scramble with them. The contrast is illustrated in (56), which contains manner and degree adverbs, and (57), which contains modal and evaluative adverbs; all adverbs in these examples are non-incidental:

\[
\begin{align*}
\text{(56) a} & \quad \text{Marie traite son frère correctement.} \\
& \quad \text{‘Marie treats her brother correctly’} \\
\text{a’} & \quad \text{Marie traite correctement son frère.} \\
\text{b} & \quad \text{Marie monte la voix excessivement.} \\
& \quad \text{‘Marie raises her voice excessively’} \\
\text{b’} & \quad \text{Marie monte excessivement la voix.} \\
\text{(57) a} & \quad \text{Marie verra probablement son frère cet été.} \\
& \quad \text{Marie will-see probably her brother (during) the summer}
\end{align*}
\]
a' * Marie verra son frère probablement cet été.
b  Marie verra heureusement son frère cet été.

Marie will-see fortunately her brother (during) the summer

The distinction among higher and lower adverbs is semantically driven: the first, but not the second, take as argument a proposition or propositional object. We account for this distinction with the following ordering constraint, where ‘higher adverb’ abbreviates the description of an adverb taking a propositional object argument:

\[(58) \quad \text{head-complements-phrase} \Rightarrow [\text{higher-adverb}] \text{precedes} [\text{higher-adverb}]\]

The analysis based on LR (54) and the two ordering constraints (55) and (58) is illustrated in (59), with the VP-inf oublier vraisemblablement cet incident complètement (forget probably this incident completely, ‘to probably forget this incident completely’). The LR has applied twice, to insert first the degree adverb complètement, and, second, the modal adverb vraisemblablement among the arguments of the V oublier. Accordingly, the LTOP of the verb is identified with that of the adverb which outscopes the other (the modal). We assume that the degree adverb takes the verb as semantic argument, and the modal takes the degree adverb as argument. The handle and LTOP of adverbs are identified, unless a quantifier takes scope in between. Since there is no quantifier in this example, they are identical. As usual, the relations (the elementary predications) accumulate at the phrase level. The scope condition on the phrase on which the relative order of the two adverbs depends is correct, since the modal has scope over the degree. The modal being a higher adverb occurs before the other complements (58), while the degree can occur after the NP.

\[(59)\]

Recall that, in this approach, there is no one-to-one correspondence between a syntactic category (and a linguistic sequence) and a semantic type. Moreover,
scopal elements such as adverbs find their argument and scope at the level of the highest node in the domain (mrs uses a sort of storage mechanism). This is the case in (59). A VPinf may be associated with an event, and, as such, be modified by a manner adverb, for instance (see sérieusement in (13a)). This type can be (and usually is) lifted to a proposition, which can then be the argument of a modal adverb, as in (59).  

Finally, the liteness constraint applies to complement adverbs, as it does to complements in general. Adverbs such as pas, plus, bien, mal, trop, beaucoup are lite, while adverbs such as aucunement, correctement, abondamment are non lite. Note that lite adverbs belong to different semantic classes: negations, manner and degree adverbs. Lite adverbs do not scramble with other complements (an observation made in Blinkenberg, 1928), unless they are modified or stressed, and cannot be extracted (see section 3.1.2). Postponing the discussion of negations (see section 4.2), we repeat examples with manner and degree adverbs.

(60) a *Marie traite son frère bien.
    ‘Mary treats her brother well’
   b Marie traite son frère [vraiment très bien].
    eats her brother really very well’
   c * Marie voit son frère trop.
    ‘Marie sees her brother too much’
   d Marie voit son frère [trop ou trop peu], suivant les moments.
    ‘Marie sees her brother too much or too little, depending on

On the other hand, non-lite adverbs can occur before lite adverbs or nouns etc., as illustrated in (61a), where the non-lite adverb vraisemblablement precedes the lite adverb bien, and (61b), where the same non-lite adverb precedes the lite N raison. This shows that lite complements (adverbs or nouns) are not incorporated into the V.  

(61) a Marie traite vraisemblablement bien son frère.
    Marie treats probably well her brother
   b Marie a vraisemblablement raison.
    Marie has probably reason (= is probably right)

Constraint (62) covers the different effects of the weight distinction that we have illustrated for complements. It allows non lite adverbs (which are [ADV⁺]) to precede lite adverbs or nouns, while forcing the latter to precede non lite, non adverbial ones (NP or PP).

(62) head-complements-phrase => [lite] precedes [non-lite [ADV –]]
On the other hand, since no constraints are specified for non-lite complements and adverbs, they are free to scramble among themselves, as illustrated in (64).

4. Syntactic Adverb classes

We distinguish between two adverb classes according to their verbal adjunction site, and bring together the properties which define the syntactic classes of adverbs, before going back to the properties of negative adverbs, which have played an important role in the hypothesis of verb movement and the hierarchy of functional projections in the first place.

4.1 Adjunction to a verbal projection

In this section, we show how adverbs can be syntactically classified on the basis of their adjunction site in the verbal domain. The possibility of being a complement does not distinguish among them, since adverbs can occur postverbally in a general way. Similarly, they can adjoin to non-verbal phrases in a general way, and, except for a small number of adverbs with a connective flavor (aussi, encore etc.) which we leave aside, fail to adjoin to finite verbs or verbal projections (VP or S). But they divide regarding the possibility of adjoining to non-finite verbs and VP: some (most) adverbs can adjoin to non-finite VP, but not all, the latter adjoining to the lexical Vinf. This dimension cross-cuts the distinctions regarding linearisation properties examined in section 3.

Class A is that of adverbs which adjoin to XP, including non-finite VP, but not to a lexical V. This class comprises the majority of the semantic classes of adverbs: evaluatives, modals, agentives, frames, negations, frequency, time and duration adverbs, plus some manner and degree adverbs (with speakers'
variation for the two last sets). They can premodify infinitival or participial VPs, as well as predicative NP, AP or PP:

(65) a  Il se réjouissait de probablement bientôt partir en vacances.
He was-happy of probably soon go(ing) on vacation
b  Il se plaignait de malheureusement toujours devoir repartir à zéro.
He was complaining to unfortunately always have to start all over again
c  Il savait ne pas immédiatement accepter.
He knew (how) to not immediately accept
d  % On le félicite de calmement prendre son temps pour répondre.
He is praised for calmly take his time to answer

(66) a  Probablement déjà parti en vacances, Jean ne répondrait pas.
‘Probably already gone on vacation, Jean would not answer’
b  Probablement aujourd'hui maire de son village, Jean ne lui avait pas répondu.
‘Probably today mayor of his village, Jean had not answered him’
c  Probablement ivre à cette heure-ci, il n'était pas joignable.
‘Probably drunk at this time of the day, he could not be reached’
d  Probablement au milieu de l'Atlantique, il n'était pas joignable.
‘Probably in the middle of the Ocean, he cou

Their common lexical entry as regards syntax is given in (68a). We assume a partition of the categories between verb and the rest (non-verb):

(67)  
\[
\text{part-of-speech} \\
\text{verb} \quad \text{non-verb} \\
\text{adjective} \quad \text{noun} \quad \text{preposition} \quad \text{adverb}
\]

(68) a. Class A adverbs 
\[
\text{adverb} \\
\text{MOD} \quad \text{[non-lite]} \quad \text{[non-verb]}
\]
b. Class B adverbs 
\[
\text{adverb} \\
\text{MOD} \quad \text{[lite]} \quad \text{[non-verb]}
\]

The specification of the weight of the modified head as non-lite prevents A adverbs from being adjoined to a lexical V, but allows them to adjoin to XP in general, as well as to a lexical item other than V. Although we cannot dwell on the topic here, in our analysis, adverbs which adjoin to VP (and not to V) can nevertheless adjoin to other lexical categories. For instance, we analyse prenominal adjectives as being lite (Abeillé and Godard 2000). Since a phrase consisting of a lite element modified by a lite element can be lite, prenominal adjectives can be modified by a lite adverb (as in \textit{une trop grande table}, lit. a too big table, ‘too big a table’). On the other hand, a phrase containing a non-lite element modifying a lite head is non-lite, hence cannot occur prenominally
(as in ?? une suffisamment grande table vs une table suffisamment grande, lit. a sufficiently big table, a table sufficiently big).

Class B consists of adverbs which may adjoin to an XP if it is not a verb, and to the lexical V (but not to the VP). They belong to the classes of manner and degree adverbs. As explained in sections 3.1.1 and 3.2, they can left-adjoin to the lexical Vinf if they are lite; otherwise, they can only occur postverbally, that is, as complements. In the latter case, they nevertheless have a MOD value which is taken into account by LR (54) which extends the argument structure of verbs. The first subset of B adverbs is that of lite adverbs such as bien, trop, beaucoup, vraiment etc., and the second one is that of postverbal adverbs such as the resultative manner adverbs verticalement ‘vertically’, élégamment ‘elegantly’ (with speakers' variation for non lite degree and manner adverbs, correlated to the variation concerning degree and manner adverbs of class A). We illustrate the behaviour of resultative manner adverbs in (69), cf. (18), where the adverb can adjoin to an AP but not to an infinitival VP, and that of lite manner and degree adverbs in (70), cf. (10), where the adverb adjoins to a (non lite) adverb, a PP, and a ‘de NP’; see examples (41)-(42), for evidence that that the adverb adjoins to a Vinf rather than a VP.

(69) a * Il promettait d’élégamment se vêtir ce soir.
   He promised to elegantly dress tonight
b Toujours élégamment vêtu, Jean aimait séduire.
   Always elegantly dressed, Jean liked to seduce
c Il promettait de se vêtir élégamment ce soir.
   He promised to dress elegantly tonight

(70) a Il se plaint trop doucement.
   ‘He complains too weakly’
b Cette idée est trop en avance.
   ‘This idea is too-much in advance’
c trop de pommes / d’argent
   Too-many (of) apples / too-much (of) grief

The distinction between class A and class B is illustrated in (71) and (72):

(71) Class A

```
(71) Class A

(Adjunct VP Head)

souvent voir Marie

(Adjunct VP Head)

ne-pas voir Marie

(Adjunct AP A Head)

suffisamment grande table

(Adjunct AP A Head)

table suffisamment grande
```
The adjunction property cross-cuts the other classificatory properties of adverbs. Most non-lite adverbs belong to class A, but some belong to class B (adverbs such as *élégamment*, see (69)). Most lite adverbs belong to class B, but not all, since negative adverbs (*pas*, *plus*, *jamais*), which adjoin to VPinf, are lite (see next section), as well as a few others, such as *vite*, *soudain*, ‘fast’, ‘sudden(ly)’). On the other hand, all higher adverbs belong to class A, whereas lower adverbs belong to class A or class B, with a lot of speakers' variation concerning manner and degree -*ment* adverbs.

4.2 Negative adverbs

Negative adverbs do not form a homogeneous semantic class in the same sense as the others. They all contain a negative relation, but this does not exhaust their semantics. In fact, except for *pas*, they belong to different semantic classes, already encountered, patterning with positive adverbs: *jamais* is a frequency adverb, like *souvent*; *aucunement*, *nullement* are manner adverbs, and *plus* is a degree (or aspectual) adverb. In this section we show that they are not syntactically homogeneous either: (i) while they all belong to class A, since they adjoin to VPinf, they are divided regarding liteness; (ii) *pas* differs from the other lite adverbs in being totally unable to scramble, a behaviour which follows from its classification as a higher adverb.

Negative adverbs left-adjoin to VP rather than the lexical V, since they can have wide scope over a conjunction of VPinf; for instance, the second conjunct in (73) contains a NP of the form ‘de N’, which must be in the scope of a negation.

(73) Paul dit ne jamais lire de journal ou prendre de vacances.
Paul says NE never read of newspapers or take of vacation

They can adjoin to non verbal projections. We illustrate here adjunction to AP and to PP:

(74) a Aucunement malades, les enfants jouaient dans la cour.
'In no way sick, the children were playing in the yard'

b Nullement / Jamais au courant des critiques, la star était rayonnante.
'In no way / Never aware of criticisms, the star was radiant'

When they occur postverbally, they are analysed as complements like the other adverbs. Regarding their position in the VP, they exhibit three different
behaviours. *Jamais* and *plus* are lite: they must occur before nominal or prepositional complements, if they are ‘bare’, but can scramble with the (non-lite) complements if they are modified, as shown in (14), repeated in (75).

\[(75)\]
\[\begin{align*}
   \text{a} & \quad \text{Paul ne voit son frère *(pratiquement) plus.} \\
   & \quad \text{‘Paul does not see his brother (almost) any longer’} \\
   \text{b} & \quad \text{Paul ne voit son frère jamais.} \\
   & \quad \text{Paul sees his brother never} \\
   \text{c} & \quad \text{Paul ne voit son frère jamais ou presque jamais.} \\
   & \quad \text{Paul sees his brother never or almost never}
\end{align*}\]

*Aucunement* and *nullement* may occur before or after non-lite nominal and prepositional complements: they are non-lite.

\[(76)\]
\[\begin{align*}
   \text{a} & \quad \text{Paul ne pense aucunement à ses soucis aujourd'hui.} \\
   & \quad \text{Paul NE thinks in no way of his problems today} \\
   \text{b} & \quad \text{Paul ne pense à ses soucis aucunement aujourd'hui.}
\end{align*}\]

The adverb *pas* differs from the others, since it must occur before all nominal or prepositional complements, even when it is modified:

\[(77)\]
\[\begin{align*}
   \text{a} & \quad \text{Paul ne rend (pratiquement) pas visite à sa grand-mère.} \\
   & \quad \text{Paul NE pays (practically) not visit to his grand-mother} \\
   \text{b} & \quad \text{Paul ne rend visite (pratiquement) pas à sa grand-mère.} \\
   \text{c} & \quad \text{Paul ne rend visite à sa grand-mère (pratiquement) pas.}
\end{align*}\]

Thus, it is not sufficient to say that *pas* is a lite adverb, like *jamais* and *plus*. Rather, *pas* behaves like a ‘higher adverb’. This analysis is comforted by another distributional property: it may be followed by a few modals, which are higher adverbs. Connectives, evaluatives, and agentives all occur before *pas*; modals are divided: while most of them must occur before, there are a few adverbs denoting necessity (*nécessairement*, *obligatoirement* ‘necessarily’) which occur either before or after *pas*, depending on their relative scope (Molinier & Levrier 2000). This possibility follows if *pas* belongs to the class of higher adverbs, like modals; *pas* rigidly follows most higher adverbs, but enter into scope-order relations with some modals. Semantically, it also makes sense to say that *pas* is a higher adverb: it is well-accepted that its argument is propositional.\(^{29}\)

\[(78)\]
\[\begin{align*}
   \text{a} & \quad \text{Paul n’a donc pas cessé de fumer. (vs *pas donc)} \\
   & \quad \text{Paul NE has thus not stopped to smoke} \\
   \text{b} & \quad \text{Paul n’a malheureusement pas cessé de fumer.} \\
   & \quad \text{(vs *pas malheureusement)} \\
   \text{c} & \quad \text{Paul n’a intelligemment pas voulu renoncer.} \\
   & \quad \text{(vs *pas intelligemment)} \\
   \text{d} & \quad \text{Paul n’a probablement pas voulu renoncer.} \\
   & \quad \text{(vs * pas probablement)}
\end{align*}\]
Paul NE has probably not accepted to give up
Paul n’a pas nécessairement compris le problème.
Paul NE has not necessarily understood the problem

Finally, we go back to the (partial) contrast between finite and infinitival clauses, which has been mentioned in section 1.2.2. The fact that negative adverbs do not occur before Vfin follows from a general constraint on head-adjunct-phrases (36) such that integrated adverbs cannot adjoin to the finite VP or S/IP; the fact that they occur after the Vfin follows from the LR (54) inserting adverbs among complements. Negative adverbs behave similarly to other adverbs in this respect. On the other hand, the behaviour of negative adverbs in infinitival clauses is more complex than has been usually assumed: not only negations can follow auxiliary verbs (tense auxiliaries être and avoir, main V avoir and the copula être), as is well-known (80), but non lite negative adverbs can follow other Vs (the two -ment negations, and jamais, plus when they are modified, see (75),(76)). In our terms, negative adverbs can be the complements of infinitival V at the condition that they be non lite.

There remains the case of pas. Because it can precede some modals and fails to scramble with the complements, we analyse it as a higher adverb. Is it lite or non lite? Since it cannot scramble, we lack the contrast between bare and modified adverb that tells us that jamais and plus are lite. But, given what we have just said, its behaviour in infinitival VPs should tell us whether it is lite or not: if it is lite, it should be able to follow the Vinf when modified, even though it must occur before the nominal complements. This is precisely what we find (79). Thus, it appears that pas is both a lite and a higher adverb.

(79) a Il avoue ne pas lire ce genre de choses.
He recognizes NE not read that sort of things
b * Il avoue ne lire pas ce genre de choses.
He recognizes NE read not this sort of things
c Il avoue ne lire [pratiquement pas] ce genre de choses.
He recognizes NE read practically not this sort of things

Semantically, the fact that pas occurs postverbally, while it takes a proposition argument, receives the same analysis as the analogous case with other higher adverbs, such as the modal adverb in (59). The argument and scope of the adverb are fully determined at the sentence level, and the sentence type is raised from an event to a proposition.

Going back to the syntax of negative adverbs, we formulate a constraint on verbs, that prevents non finite verbs, except for auxiliaries ((80), which we note as [AUX+] verbs, as in Kim & Sag 2001), from taking lite negative adverbs as complements.

(80) a Il avoue n’être jamais prévenu de ce qui se trame.
He recognizes NE be never warned about what is brewing
b Il avoue n’avoir pas compris le problème.
He recognizes NE have not understood the problem
Negative adverbs are described as containing a negative relation. The constraint in (81) says that, if a lite negative adverb is the complement of a V, then the V must be finite or an auxiliary. Accordingly, only non-lite negative adverbs can occur after the (non auxiliary) Vinf.

\begin{equation}
\text{(81) Lexical constraint on verbs}
\end{equation}

\[
\begin{array}{c}
\text{verb} \\
\text{ARG-ST} <\ldots, \\
\text{adverb} \bigg[ \text{CAT} \text{WEIGHT lite} \\
\text{CONT} \bigg] \text{RELS } \langle \text{neg-rel, } \ldots \rangle \ldots \bigg], \\
\text{CAT } [\text{HEAD VFORM } \text{fin} ] \Delta [\text{AUX } +1] \\
\end{array}
\Rightarrow
\]

The lexical descriptions of \textit{pas} and \textit{aucunement} differ by their weight and the type of semantic argument that they take. Leaving aside the argument type, we give their schematic lexical entry in (82):

\begin{equation}
\text{(82)}
\end{equation}

\[
\begin{array}{c}
\text{CAT } \text{adverb } \bigg[ \text{MOD} \\
\text{HEAD } \langle 1 \rangle \\
\text{WEIGHT non-lite} \\
\text{LTOP } h1 \\
\text{KEY } \langle 2 \rangle \bigg], \\
\text{WEIGHT lite} \\
\text{LTOP } h2 \\
\text{CONT} \bigg[ \text{RELS } \langle \text{neg-rel} \bigg], \\
\text{HANDLE } h2 \rangle \bigg], \\
\text{CONT} \bigg[ \text{RELS } \langle \text{neg-manner-rel} \bigg], \\
\text{HANDLE } h2 \rangle \bigg], \\
\end{array}
\]
There is no need in our system to force negative adverbs to have a uniform syntactic behaviour. Although they all belong to class A (they modify VPs rather than Vs) like the majority of adverb classes, they differ among each other along two dimensions: weight and scrambling. Weight being a property of lexemes (as well as phrases), the fact that negative adverbs are either lite or non-lite is not remarkable in itself: they pattern like manner or degree adverbs. As regards scrambling, negative adverbs, which do not form a homogeneous class, pattern as expected. *Plus, jamais, aucunement, nullement* can scramble, as can aspectual (or degree) adverbs, frequency and manner adverbs, respectively; on the other hand, *pas*, the only adverb among them which takes a propositional argument, behaves just like higher adverbs in a general way. Like adverbs in general, they can modify expressions of different categories, they follow finite verbs, and can precede or follow non finite ones. The only difference with other adverbs is the restriction on their occurrence after non-finite verbs, which is stated in (81): while lite manner or degree adverbs can follow Vinf, negative adverbs can do so in a general way only if they are non-lite.

**Conclusion**

In this paper, we have stressed three distributional properties of adverbs: (i) they can precede or follow the verb; (ii) they are syntactically polymorphic, in that they modify expressions belonging to different parts of speech; (iii) they enter into three configurations regarding their relative ordering (rigid ordering, scope differences depending on ordering, free ordering with no scope difference). Properties (ii) and (iii) raise serious difficulties for the hypothesis that adverbs occur as specifiers of (or adjuncts to) functional projections, whose ordering is fixed and responsible for scope relations among adverbs. We propose an alternative analysis, which does not use functional projections or movement, and combines different aspects of the grammar of adverbs. First, (integrated) adverbs are either adjuncts (when they precede the expression they modify) or complements (when they follow it). Second, they differ among themselves along three dimensions: their adjunction site (they all adjoin to non verbal phrasal and lexical categories, but some adjoin to VPinf, and others to Vinf), their weight (they can be lite or non-lite), and their scrambling properties (some adverbs scramble and some do not scramble with nominal and prepositional complements). Finally, their position is a function of their scope properties, which are semantically determined, interacting with constraints on the head-adjunct-phrase (the adjunct has scope over the head), and on ordering in the VP.

**References**


Notes

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† The analysis also aims at explaining the difference between French and English. In English, only auxiliary verbs are said to move to T, and are thus the only ones to occur before not.

‡ In the text, we provide glosses rather than translations, relying on the closeness of the two languages.

§ It is also meant to account for the relative ordering of modal and aspectual verbs (Cinque 2000). For a criticism of this hypothesis, based on Spanish, see Laca (2002).

¶ But see below section 2.4.1. Cinque, himself, speaks of ‘parentheticality’ rather than ‘incidentiality’. Distinguishing between the intonative and semantico-pragmatic dimensions which are usually confused, we use ‘incidental’ for the intonation property. On French parenthetical adverbs, see Jayez and Rossari (2002).

∥ There are a few well-known adverbs which are adjoined to S without being incidentals, requiring subject clitic inversion (Aussi ne viendra-t-il pas, ‘Thus he won't come’). We leave them aside here. In addition, we suppose that some adverbs (some manner adverbs, and a quantifier such as jamais (‘never’)) can be extracted and ‘moved’ to S-initial position (as in GENTiment, je te dis qu’il m’a traité, le prof ! Kindly, I tell you he treated me, the teacher, JAMAIS il ne ferait ça !, Never he would do that). The construction requires a specific intonation pattern (distinct from that of incidental adverbs, note the stress on the beginning), see Bonami et al. (2002). Extracted adverbs are not relevant here.

¶¶ The accepted semantic classes are (see Greenbaum 1969, Jackendoff 1972 for English, Bartsch 1976 for German, and Schlyter 1977, Molinier et Lévrier 2000 for French): speech act adverbs (franchement ‘frankly’), connectives (donc, pourtant, premièrement ‘therefore, however, first’), evaluatives (malheureusement, bizarrement ‘unfortunately, strangely’), modals (probablement, peut-être, certainement ‘probably, perhaps, certainly’), agentives (cf. Geuder 2000, intelligemment, généreusement ‘intelligently, generously’, cf. the subject oriented adverbs of Jackendoff 1972), volitionals (volontairement ‘willingly’, cf. Thomason and Stalnaker 1973), frames (légalement, syntaxiquement ‘legally, theoretically, syntactically’), frequency adverbs (souvent, fréquemment, rarement ‘often, frequently, rarely’), duration adverbs (longtemps ‘for a long time’), time adverbs (immédiatement, bientôt ‘immediately, soon’), degrees (beaucoup, complètement ‘a lot, completely’), and manners (calmement, gentiment ‘calmly, kindly’).

¶¶¶ Ernst (2002: 129) notes that the order of English adjectives in the NP parallels that of adverbs in the sentence, a fact which argues against the syntactic hierarchy of functional projections for adverbs, and in favor of a (semantic) scope-based theory of ordering.


¶¶¶¶¶ Alternatively, Laezlinger (2002) proposes that, rather than the V, it is the ‘remnant VP’ (out of which the complements have moved) which moves.

¶¶¶¶¶¶ For the properties of pas, see below section 4.2.
We borrow the feature MOTHER from Sag et al. (2003); it helps making clear what the syntactic and semantic constraints are on the phrase itself (that is, the mother).

In standard HPSG, one can only order elements at the same phrase structural level, i.e. sister constituents. For an alternative view allowing more freedom, see Reape 1994, Kathol 1995.

Constraint (22a) is restricted to nominative subjects (we analyse inverted subjects as non-nominative). Constraint (22c) is restricted below to take into account the prosodic distinction between incidental and integrated adverbs which have different ordering possibilities (for instance, incidental adverbs can be post-head adjuncts, as in *Il arrivera à l’heure, naturellement ‘He will be on time, of course’*).

see Abeillé and Godard 2000, 2004, for a more general presentation, based on French and cross-linguistic data, respectively.

There is one unexpected piece of data: wh-adverbs cannot occur between a tense auxiliary and a participle, hence the contrast between (i) and (ii):

(i) Paul a beaucoup lu de romans policiers. (P. has a-lot read of crime stories)
(ii) * Paul a combien lu de romans policiers ? (P. has how-many read of crime stories)

Incidental expressions differ from integrated ones: incidental NP and PP may be acceptable.

Alexiadou (1997) has a dual analysis for Greek adverbs, as specifiers of FP or as complements of verbs. Only ‘light’ adverbs can be complements as well as incorporate. We agree that only ‘lite’ adverbs can incorporate (see fn 21), but for us ‘liteness’ is another classificatory dimension, and all adverbs can be complements. Another difference is that complement adverbs scramble for us inside the VP, whereas Alexiadou generates them as VP final, and has a rule that moves some of them to a FP between V and the other complements.

To take integrated adverbs adjoined to S into account (see fn 5), we can specify that the verb in (36) is non-(clitic)-inverted (clitic inversion being a head feature is accessible outside of S); since only the adverbs of the ‘aussi’ class modify (the projection of) an inverted V, we get the right result.

The unacceptability of (39b,d) is due to the fact that *de must be repeated on a conjunction of VPinf. If an adverb is adjoined to the conjunction of VP, *de does not have to be repeated, because the conjunction is not directly ‘marked’ by *de. Thus, the fact that the adverb does not allow a single *de in (39b,d) shows that the adverb is not adjoined to the VP, see Abeillé & Godard (1997).

There is speakers’ variation (noted ‘%’) regarding the adjunction of a degree adverb like *à VP (not regarding wide scope over a conjunction of VPs).

Nevertheless, the incorporation analysis may be right for an even smaller class of lite adverbs, for certain speakers. For such speakers, *bien, mieux, tout (to the left of a Vinf) fail to have wide scope over a conjunction of lexical Vs. Thus, (i)-(ii) contrast with (41):

(i)  % Il faut du temps pour tout lire et traduire. (We need time to all read and translate)
(ii)  % Il se promet de bien manger et boire à la fête (He is ready to well eat and drink at the party)

Note that only lite adverbs can be morphologically incorporated: *bien-portant, mal-aimé, trop-plein, etc.*

This is a simplification: there are adjunctions which are not scopal elements. To take them into account, there are several possibilities: one may distinguish between two subcases of *head-adjunct-phrases* (Copestake et al. 2003), or one may put the scopal information in the description of the adjunct itself (Bonami and Godard 2003).

The fact that (integrated) adverbs are not adjoined to finite V or VP while they can be their complement is not a problem either (although finiteness is part of the head value). As we have seen, we derive the data from a general constraint on the *head-adjunct-phrase* (see (34)) rather than from the adverb lexical specifications.

We leave open the possibility that some adverbs (e.g. manners) do not take scope over the verb, but share the same LTOP.

Laezlinger (2002) gives some examples of postverbal adverbs with a different ordering. This is because he does not distinguish between incidental and integrated occurrences of adverbs (incidental adverbs have different scope and order properties, see Bonami et al. 2002). We exclude incidental adverbs here.

In HPSG, this type lifting can be represented by a head-only-phrase, where the mother has a different semantics from the daughter, but inherits its syntax (see Ginzburg and Sag 2000).
For arguments to the effect that they are not incorporated in a general way when they are adjoined to the lexical V, see section 3.1.2

Abeillé and Godard (1997) have three adverb classes, because incidental occurrences of adverbs are not distinguished from integrated occurrences. Accordingly, there is a third class of adverbs adjoined to S.

Sentences where the VPinf complement of a perception verb is negated raise a problem (On a vu cette voiture ne pas s'arrêter au feu rouge, We saw this car not stop at the red light). There is no consensus on the analysis of such sentences (for some discussion, see Amsili et al. (2002).

When the negation pas is adjoined to a different syntactic category such as an AP in Pas content de la solution proposée, Paul a décidé de s'atteler au travail, (Not satisfied with the proposed solution Paul decided to start working), there are two possibilities. Either the adverb is semantically as well as syntactically polymorphic (in this instance, it would take a property of individuals as its argument), or the AP content type is raised to a proposition. We opt for the second solution, although the matter is outside the scope of this paper.