Abstract

In this paper, we shall propose a treatment of French clitic climbing as an instance of morphological periphrasis. In particular we shall reexamine the evidence in favour of argument composition and a flat VP structure with tense auxiliaries (Abeillé & Godard, 2002) and show (i) that the V (vs. VP) status of the complement does not strictly correlate with the possibility of clitic climbing, (ii) that transparency in bounded dependencies transcends the class of argument composition verbs, and (iii) that a flat VP structure complicates the treatment of modification and coordination. Adopting an approach in terms of periphrastic realisation along the lines of Bonami (2015), we can provide a treatment of the climbing facts that does full justice to the limited mobility and their morphologically bound status (Miller, 1992) without having to rely on a flat VP structure. Finally, we shall show that the pronominalisation and extraction facts can be dealt with in a uniform fashion by way of constraints on canonical vs. non-canonical argument realisation.

Romance pronominal clitic systems feature "climbing" of the pronoun from the verb it is an argument of to some other verb, like an auxiliary or a restructuring verb. Consider for example the following French sentences:

(1) Alice les envoie.
Alice CL_{do} sends
'Alice sends them.'

(2) Alice les a envoyés.
Alice CL_{do} has sent
'Alice has sent them.'

This apparent displacement (i.e. from the downstairs verb to the upstairs verb) suggests syntactic mobility, while the clitics' attachment properties suggest they are morphologically bound. To resolve this analytical paradox, generative studies have typically resorted to movement to deal with the syntactic aspect of the problem (Kayne, 1977), while in lexicalist frameworks like HPSG emphasis has been placed on the morphological properties.

Previous HPSG analyses of French clitic climbing (Miller & Sag, 1997; Abeillé & Godard, 2002) relied on argument composition (Hinrichs & Nakazawa, 1990) whereby the auxiliary inherits the argument structure of its participial complement, allowing the arguments of the lower verb to be realised on the auxiliary. This mechanism effectively triggers systematic object raising in all analytic tenses (in fact, in all complex predicates where clitic climbing is possible), and has therefore the important side-effect of giving rise to a flat structure (Figure 1a) for such constructions, as opposed to the hierarchical structure traditionally assumed in generative grammar (Figure 1b).

In this paper we build on recent developments in morphological theory and propose to account for clitic climbing in French analytic tenses as an instance of inflectional periphrasis, where the lexical verb delegates parts of inflectional exponence

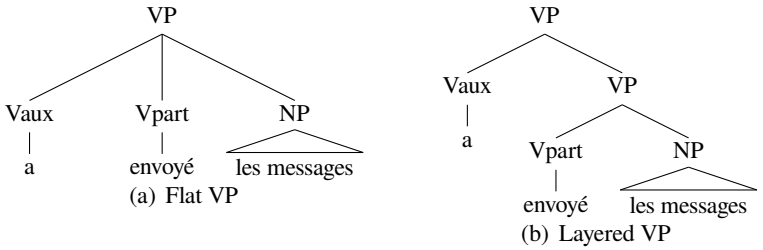

Figure 1: Layered vs. flat structure of French VP

to the auxiliary. We suggest that this opens up the possibility to maintain a standard hierarchical structure of VP, and we argue in favour of this structure on empirical and theoretical grounds.

1 The classical HPSG approach: climbing by argument composition

Based on the rigorous application of Zwicky & Pullum (1983)'s diagnostic criteria in Miller (1992), Miller & Sag (1997) argue that French pronominal clitics should be regarded as pronominal affixes, lexically attached to their host, rather than as postlexical clitics: in particular they exhibit a high degree of selection with respect to their host (A), arbitrary gaps in the set of combinations (B), as well as morphophonological (C) and semantic idiosyncrasies (D), they are subject to haplology, and cannot take wide scope over a coordination of hosts.

In order to do full justice to their affixal status, Miller & Sag (1997) propose a lexical analysis of French clitics: more specifically they suggest that pronominal affixes lexically realise arguments of their host. Building on argument composition (Hinrichs & Nakazawa, 1990), they generalise this approach to clitic climbing, as observed with tense auxiliaries, such as *avoir* 'have' and *être* 'be': if these auxiliaries inherit the argument structure of their complement, as sketched in Figure 2, these arguments will be locally available on the auxiliary, including morphological expression as pronominal affixes.

$$\left[\text{ARG-ST}\ \left\langle\left[\begin{array}{ll}\text{HD} & \textit{verb}\\ \text{ARG-ST} & \boxed{1}\end{array}\right]\right\rangle \oplus \boxed{1}\right]$$

Figure 2: Argument composition

Argument composition implies that the verbal complement of the auxiliary be unsaturated, i.e. a lexical verb, rather than a VP. They cite evidence due to Abeillé & Godard (2002) suggesting that the complements of French auxiliary *avoir/être* (3) do not behave like VP complements in English or like the complements of French modals (4). In particular, they cannot be pronominalised (3a), nor can they be extracted (3b),

nor elided (3c).

(3) a. * Jean croyait avoir compris, mais il ne l'avait pas.
Jean believed have understood but he CL$_{neg}$ CL$_{do}$ had not

b. * C'est bu trop de vin qu'il a
it is drunk too much of wine that he has

c. * Jean croyait avoir compris, mais il n'avait pas.
Jean believed have understood but he CL$_{neg}$ had not

This contrasts sharply with a modal like *vouloir* 'want' that permits pronominalisation (4a), extraction (4b) and elision (4c) of its VP complement.

(4) a. Jean peut venir chez nous, mais il ne le veut pas.
Jean can come to us but he CL$_{neg}$ CL$_{do}$ wants not
'Jean can come to our house, but he doesn't want that.'

b. C'est partir au Japon qu'il veut.
it is leave to.the Japan that he wants
'It is leaving for Japan that he wants'

c. Jean peut venir chez nous, mais il ne veut pas.
Jean can come to us but he CL$_{neg}$ wants not
'Jean can come to our house, but he doesn't want to.'

Abeillé & Godard (2002) argue that argument composition captures these properties quite effortlessly, since under their account auxiliaries do not take a VP as their complement, but rather a lexical V the arguments of which are raised. Thus, since modals take a VP complement, this complement can pronominalise, extract or elide. Conversely, if tense auxiliaries do not take a VP complement in the first place, VP pronominalisation, extraction, and elision are all expected to be illicit, as is indeed the case.

Another important observation pertaining to clitic climbing relates to the boundedness of the phenomenon, a property which is quite well captured by argument composition, but quite less so by $\bar{A}$-movement or SLASH feature percolation.

2 Discussion

In this section, we shall subject the evidence purported in favour of a flat VP structure to some further scrutiny. We shall argue that the strong correlation between clitic climbing and failure of the verbal complement to undergo pronominalisation, extraction or elision does not carry over to other auxiliaries: in particular we shall discuss cases where neither pronominalisation/extraction of the verbal complement nor clitic climbing are possible (periphrastic infinitive tenses), as well as cases where both are (passive/predicatives). Similarly, we shall show that bounded dependencies, as found inter alia in the *tough*-construction, are equally independent of argument composition.

Furthermore, we shall show that the evidence from manner adverbs is not fully conclusive and argue that a flat structure complicates rule-by-rule composition. Finally, we shall look into coordination of participial phrases, which supports an analysis in terms of a hierarchical VP structure.

2.1 Dissociation between clitic climbing and VP structure

The classical approach to French tense auxiliaries derives its elegance from the fact that it relates clitic climbing as well as the failure of the participial VP complement to undergo extraction or pronominalisation to a single unifying property, namely argument composition. However, upon further scrutiny, we find that these empirical properties are actually disconnected.

2.1.1 Periphrastic tenses beyond auxiliary *avoir/être*: *futur proche* and *passé récent*

To start with, auxiliary *avoir* and *être* are not the only temporal auxiliaries in French whose verbal complements fail to extract, pronominalise or elide. As shown in (5) and (6), the very same holds for the auxiliaries *aller* and *venir de*, which are used in the *futur proche* and the *passé récent*.

(5) a. Marie va envoyer la lettre.
Marie goes send the letter
'Marie is going to send the letter.'

b. * Envoyer la lettre, Marie (le) va.
send the letter Marie CL_{do} goes

(6) a. Marie vient d'envoyer la lettre.
Marie comes of send the letter
'Marie has just sent the letter.'

b. * (D')Envoyer la lettre, Marie (en/le) vient.
of send the letter Marie CL_{de}/CL_{do} comes

Most interestingly, neither of these auxiliaries may serve as a host for clitic climbing.

(7) a. Marie va l'envoyer.
Marie goes CL_{do} send
'Marie is going to send it.'

b. * Marie la va envoyer.
Marie CL_{do} goes send

(8) a. Marie vient de l'envoyer.
Marie comes of CL_{do} send
'Marie has just sent it.'

b. * Marie la vient d'envoyer.
Marie CL_{do} comes of send

Thus, failure for the VP complement to pronominalise, extract or elide does not correlate with argument composition. If the extraction and pronominalisation facts necessitate an explanation on independent grounds, a central piece of independent evidence for argument composition and a flat VP structure simply vanishes.

2.1.2 Predicatives and passives

By contrast, clitic climbing is indeed attested for the copula and passive auxiliary *être*.

(9) La lettre lui a été envoyée.
the letter CL$_{io}$ has been sent
'The letter has been sent to him/her.'

(10) Marie y était prête.
Marie CL$_{loc}$ was ready
'Marie was ready for it.'

However, its verbal or predicative complements can in fact be extracted or pronominalised (Abeillé & Godard, 2002), as shown in (11) and (12).

(11) a. Envoyée à Marie, la lettre l'a été.
sent to Marie the lettre CL$_{do}$ has been
'Sent to Mary the letter has been.'

b. C'est envoyée à Marie que la lettre a été.
it is sent to Marie that the letter has been
'Sent to Mary the letter has been.'

(12) a. Prête à la recevoir, Marie l'était.
ready to CL$_{do}$ receive Marie CL$_{do}$ was
'Ready to receive it Mary was.'

b. C'est prête à la recevoir que Marie était.
that is ready to CL$_{do}$ receive that Marie was
'It was ready to receive it that Marie was.'

Abeillé et al. (1998, pp. 26-31) account for this behaviour by way of assuming that argument composition applies optionally here. On the downside, this leads to spurious ambiguity between a flat and a layered structure whenever there are no clitics present.

2.1.3 Fronting of lexical V

Finally, while the flat structure analysis of tense auxiliaries *avoir* and *être* captures that their VP complements do not extract, there being a V but no VP argument, this analysis predicts, *ceteris paribus*, extraction of their V complement, an option that is available in German, yet illicit with French tense auxiliaries.

(13) * Envoyé, Marie (l')a la lettre.
sent Marie (CL_{do}) has the letter

Most interestingly, the passive auxiliary, which does permit both clitic climbing and extraction/pronominalisation of its VP complement, also permits partial fronting of a participial V complement:

(14) Envoyée, la lettre l'a été à Marie.
sent the lettre CL_{do} has been to Marie
'Sent, the letter has been to Mary.'

Thus, if partial fronting of a lexical V is indeed possible in French, it comes as a surprise that it should only be so with passive participles, but not perfective ones. Note further that passive and perfect participles in French are systematically syncretic. Given that neither a VP nor a V complement of the tense auxiliaries *avoir* and *être* can ever extract or pronominalise, we conclude that a flat structure does not provide the relevant distinction.

2.2 Bounded dependencies

Another argument for argument composition is the transparency of analytic tenses to bounded dependencies, such as *à*-infinitival modifiers. In example (15), a dependency is established between the direct object of the verb and the noun modified by the whole construction, even though the same dependency fails to be established across a control construction (16) (Abeillé & Godard, 2002).

(15) Un livre à avoir lu.
a book to have.INF read.PTCP
'A book to have read.'

(16) * Un livre à promettre de lire.
a book to promise.INF of read.INF
'A book to promise to read.'

Abeillé et al. (1998) provide an analysis of French bounded dependencies as reduced relative clauses that relies on object raising. Their analysis leaves three issues unresolved: first, it fails to account for the fact that these bounded dependencies may only involve direct objects. Second, it does not capture the predicative use of these *à*-infinitivals illustrated below, as relatives in French only appear attributively.

(17) Ce livre est à lire (par tous les étudiants).
this book is to read by all the students
'This book is to be read (by all the students).'

The third issue, however, is the most pertinent in the present context: the argument composition perspective on bounded dependencies focuses too narrowly on auxiliary

avoir/être, while failing to capture the very similar behaviour of various modal and aspectual verbs illustrated below, none of which allow clitic climbing.

(18) % une ville difficile à aller visiter en ce moment
a town difficult to go visit nowadays
'a town difficult to go to visit now'
(Abeillé et al., 1998, glossing ours)

(19) Ce n'est pas un livre à vouloir lire en une nuit ou même 3 jours.
this NE.is not a book to want read in one night or even 3 days
'This is not a book to want to read in a night or even three days.'
(amazon.fr)

We believe the apparent object raising with simultaneous subject demotion is best understood as a case of passivisation akin to modal infinitival passives found in German. Indeed, these constructions allow for the demoted subject to be realised as an oblique, reminiscent of a full passive (cf. (17)). This immediately explains the constraint on the function of the dependent, as passives in French only promote direct objects. If our analysis is on the right track, we are dealing with subject raising here, not full argument composition.

2.3 Manner adverb placement

Yet another empirical argument put forth by Abeillé & Godard is the placement of a subclass of manner adverbs, exemplified by *bruyamment*. Like most French adverbs, members of this class can intervene between the auxiliary and the participle; however, this is, according to Abeillé & Godard, the only context in which they can pre-modify a verb, as the sentences in (20-21) show. Furthermore, when the participle is involved in a coordinate structure (22), they have narrow scope over the first conjunct only.

(20) Elle est bruyamment sortie.
she is loudly exited
'She went out loudly.'

(21) ?? Bruyamment sortie, elle est rentrée aussitôt.
loudly exited she is come back soon
'Having gone out loudly, she came back soon.'

(22) Jean a attentivement écouté son professeur et pris des notes.
Jean has attentively listened his professor and taken notes
'Jean listened carefully to his teacher and took notes.'

These data are taken to jointly show that the adverb can neither attach to the participle (otherwise sentence (21) should be grammatical) or to the auxiliary (otherwise sentence (22) should allow wide scope over the whole coordinate structure). They suggest that the appropriate attachment is to the root of the flat structure.

There are two important issues with this argument, one empirical, the other theoretical. First, the empirical status of the data is far from clear. Examples from corpora and the literature alike contradict the alleged unacceptability of the preverbal modifier position for the adverbs cited by Abeillé & Godard (2002):

(23) Péniblement descendus de leurs palanquins, ils se sont placés sur
painfully dismounted of their sedan chairs they CL*refl* are placed on
des fauteuils, ...
the sofas, ...
'Having painfully gotten off their sedan chairs, they sat down on the sofas, ...'

(frWaC, Ferraresi et al., 2013)

(24) % Jean s'est décidé à bruyamment sortir de la pièce.
Jean CL*refl* is decided to noisily leave of the room
'Jean decided to leave the room noisily.'

(Bonami et al., 2004, glossing and translation ours)

Additionally, the exact definition of the relevant class of adverbs is not clear, and "seems to be particularly subject to variation" (Bonami et al., 2004).

Second, a flat VP structure where modifiers are interspersed with arguments complicates semantic composition: as discussed in Kasper (1994), semantic composition in head-complement-adjunct structures must be relegated to a recursive relational constraint, instead of simply relying on syntactic recursion, as is possible with binary head-adjunct and head-complement structures.

2.4 Coordination

A final problem faced by the argument composition approach, pointed out by Manning (1997), is contributed by the coordination data illustrated below.

(25) Marie envoie une lettre et reçoit une réponse.
Marie send.PRS.3SG a letter and receive.PRS.3SG a reply
'Marie sends a letter and receives a reply.'

(26) Marie a envoyé une lettre et reçu une réponse.
Marie have.PRS.3SG send.PTCP a letter and receive.PTCP a reply
'Marie sent a letter and received a reply.'

Under a traditional layered structure analysis, the two examples (25–26) receive a uniform analysis as VP coordination. Under the flat structure posited by Abeillé & Godard, however, the coordination in (26) is unexpected, since the conjoined sequences do not form constituents. Abeillé & Godard suggest resorting to a non-constituent coordination analysis, but this amounts to generalising to the worst case, as to our best knowledge no criterion has been used to show a difference in status between (25) and (26).

Summary

	clitic climbing	VP fronting	V fronting	VP pron
vouloir/pouvoir	no	yes	no	yes
avoir/être (past)	yes	no	no	no
aller	no	no	no	no
Passive/predicative	yes	yes	yes	yes

Table 1: Clitic climbing vs. status of verbal complement

To summarise our discussion, we have shown that the flat VP analysis of French analytic tenses complicates the treatment of coordination and modification. We have shown, furthermore, that the core arguments against a layered VP either proved to be unstable, as was the case for modifier placement, or else did not correlate with the possibility of clitic climbing in the general case, as we established for the extraction and pronominalisation facts.

Thus, while we concur with previous HPSG work regarding the morphologically bound status of French pronominal affixes, we argue that argument composition does not provide a satisfactory analysis. Instead, we shall propose that a conventional layered VP structure can be maintained, once we regard clitic climbing as an instance of inflectional periphrasis. As we shall see in Section 4, the difference with respect to VP/V extraction and pronominalisation can be captured in a unified fashion by means of lexical constraints on canonical vs. non-canonical argument realisation.

3 Periphrasis

Within morphological theory, the issue of periphrastic realisation of inflectional categories has received considerable attention in recent years, suggesting that synthetic and analytic realisation stand in a paradigmatic relation (Ackerman & Webelhuth, 1998; Sadler & Spencer, 2001; Spencer, 2003; Bonami & Webelhuth, 2013).

French (and Romance in general) composed tenses have long been considered to differ from general raising constructions in that they constitute an instance of inflectional periphrasis, i.e. they are nothing more than the exponence of some part of the paradigm of the participle (henceforth the *lexical verb*). They express aspectual properties[1] that would be difficult to separate from the tense and mood properties that are clearly part of the synthetic paradigm; they can even express tense itself: in example (27), the meaning of the periphrase can be perfective, but it is more commonly past, at least in some varieties of French.

(27) Alice a dormi.
Alice have.PRS.3SG sleep.PTCP
'Alice slept.' (PST.IPFV) or 'Alice has slept.' (PRS.PFV)

[1] For our purposes, a characterisation of the aspectual contribution of the periphrase as perfectivity will suffice. For a more in-depth study of the French TAM system, see Verkuyl et al. (2004).

Furthermore, in this very example, the non-compositionality of the morphosyntactic features is also evident: while the participle could be claimed to carry a perfectivity feature to derive the perfective present meaning, the auxiliary's present-tense inflection makes it impossible to obtain a straightforwardly compositional derivation of the imperfective past variant.

A further argument in favour of the analysis of French composed tenses as inflectional periphrasis can be drawn from phenomena of auxiliary selection. In French, some verbs express their composed tenses with the auxiliary *avoir* ("have"), while others rely on *être* ("be"). While in a purely syntactic perspective the distinction between the two classes of verbs has to be stipulated, under the periphrasis approach this can easily be reduced to a matter of inflectional classification, the French verbs belonging to one of two classes, the first class being productive while the other is not. Additionally, evidence from various dialects of Italian (Štichauer, 2019) shows that the various splits characteristic of inflectional paradigms are well-represented in Romance, most importantly Pāṇinian splits, but also morphomic ones. French tenses then simply represent an instance of a lexical split.

Most recently, Bonami (2015) has proposed a formal treatment of inflectional periphrasis based on the idea of *mutual selection*, i.e. standard subcategorisation, from the auxiliary to the lexical verb, complemented by a *reverse selection* mechanism, from the latter to the former. This mechanism crucially allows for the expression of the relevant morphosyntactic properties to originate on the lexical verb; a distinction between morphosyntactic features and purely morphological features further allows the lexical verb to impose constraints on the morphological features of the auxiliary, which may (in the compositional case) or may not (in the non-compositional case) correspond to the morphosyntactic properties that the periphrase inflects for. The tree in Figure 3 provides a simplified schematic representation of feature percolation in a basic French composed tense.

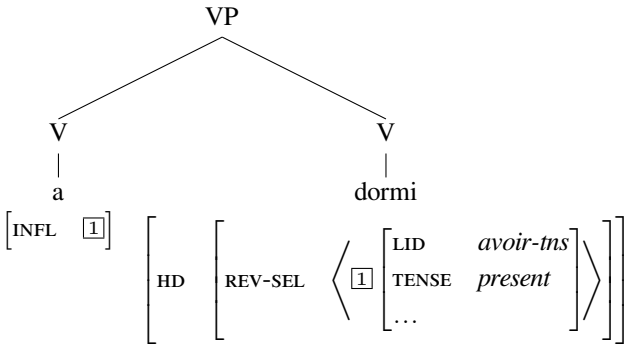

Figure 3: Periphrasis by reverse selection

Following Bonami (2015), who relies on (head) projections to percolate the reverse selection feature, we make REV-SEL a HEAD feature as illustated in Figure 3. Indeed, the phenomenon we are interested in is a bounded dependency, and consequently only the participle and its projections in syntax should be able to pass on the

periphrastic exponence constraint.[2] This analysis of clitic climbing as periphrastic exponence will therefore be fully compatible with the hierarchical structure of the VP defended in Section 2, since the VP projected by the participle will successfully inherit its head's REV-SEL constraint via the Head Feature Principle.

The INFL feature that is matched with REV-SEL contains the auxiliary's lexical identity (LID), which ensures the appropriate auxiliary (*avoir* or *être*) is used, as well as inflectional features such as tense. We choose to make REV-SEL a list-valued feature mainly to allow it to stay empty: non-auxiliary verbs can then constrain their verbal complement not to have an unsatisfied periphrastic requirement.

The intuition behind the periphrasis approach to clitic climbing that we propose is then as follows: as we have just seen, the mutual selection relation between the auxiliary and the lexical verb in French analytic tenses is independently required to capture the periphrastic nature of these constructions. Reverse selection, which constitutes half of this mutual selection, provides a direct way for the lexical verb to impose constraints on the morphology of the auxiliary: it enables the past participle to defer the realisation of various inflectional properties to the auxiliary. In much the same way, it will let the past participle defer the morphological realisation of its arguments to an auxiliary. All that is required is a morphological representation of the pronominals the expression of which will be relegated to the auxiliary. As we have already mentioned in Section 1, French weak forms are best understood as lexically bound pronominal affixes, i.e. the morphological realisation of a verb's arguments. An encoding of these affixes as verbal morphology therefore seems most adequate. The result is an analysis of clitic climbing as an entirely morphological phenomenon, the details of which we now turn to.

4 Analysis

In what follows, we are going to propose a reanalysis of clitic climbing in French analytic tenses in terms of morphological periphrasis. We argue that once climbing is understood as a morphological phenomenon, French clausal syntax can be uniformly analysed in terms of a layered VP structure. We show that this move is beneficial for three main reasons: first, it provides for a straightforward analysis of conjoined participial phrases in terms of standard constituent coordination. Second, it facilitates semantic composition, permitting the use of binary branching interleaved head-complement and head-adjunct structures, as opposed to n-ary branching head-complement-adjunct structures. And third, it completely avoids spurious ambiguity with passives or predicative XPs.

Finally, we shall show that the extraction and pronominalisation facts can be straightforwardly accounted for solely in terms of canonical vs. non-canonical re-

[2]To clarify, the issue of the percolation of the reverse selection feature is independent from that of the possible configurations in which the auxiliary and the lexical element may stand. As Bonami & Webelhuth (2013); Bonami (2015) show, such configurations are numerous, but this variety should be accounted for in the subcategorisation of the auxiliary.

alisation.

4.1 Argument realisation

Following Miller (1992) and Miller & Sag (1997), we shall assume that French clitics are best conceived of as morphologically bound affixes realising pronominal arguments. From a syntactic perspective, we shall therefore treat pronominal affixation as an instance of non-canonical argument realisation. Accordingly, we shall adopt the Argument Conservation Principle (Ginzburg & Sag, 2000), according to which a word's ARG-ST list corresponds to the concatenation of the valence lists, shuffled with a list of non-canonical arguments.

$$word \rightarrow \begin{bmatrix} \text{SYNSEM} & \left[\text{LOC}\left[\text{CAT}\left[\text{VAL}\begin{bmatrix}\text{SUBJ} & \boxed{1}\\ \text{COMPS} & \boxed{2}\end{bmatrix}\right]\right]\right] \\ \text{ARG-ST} & \boxed{1} \oplus \boxed{2}\ \mathit{list(canon)} \bigcirc \mathit{list(non\text{-}canon)} \end{bmatrix}$$

Figure 4: Argument Conservation

In order to model canonicity of argument realisation, we adopt a hierarchy of *synsem* types as given in Figure 5. This hierarchy incorporates a type *unexpr(essed)-s(yn)s(em)* to represent argument ellipsis.

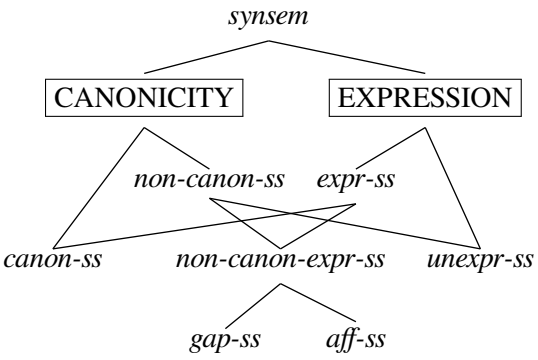

Figure 5: Hierarchy of *synsem* types

While realisation of gaps (=*gap-ss*) is regulated by Slash Amalgamation (Ginzburg & Sag, 2000), we need to make explicit realisation of pronominal arguments (=*aff-ss*). To this end, we propose a constraint on feature structures of type *lexeme* along the lines of Figure 6. In essence, this constraint regulates that each *aff-ss* object on ARG-ST corresponds to an element on the PRAF list, a feature that is part of the word's INFL. We assume that minimally INDEX and MARKING features need to be made available to inflectional morphology, in order to ensure correct realisation, which is sensitive to both person, number, and gender features and grammatical function.

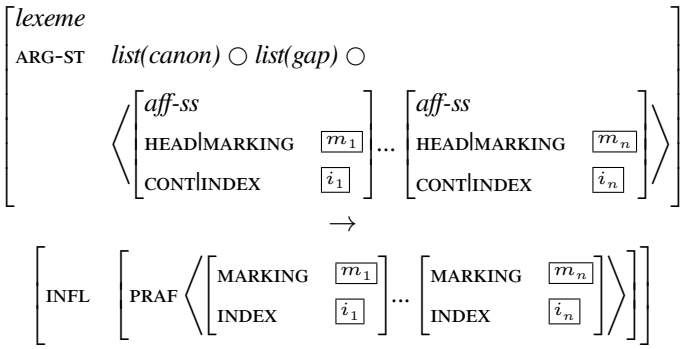

Figure 6: Mapping of pronominal arguments

The INFL feature, including the PRAF list will serve as input to inflectional morphology. In accordance with our implemented LKB grammar of French, we shall make use of cascaded inflection rules which recursively process the PRAF list and add appropriate pronominal affixes to the host's phonology.[3] An example of such a rule is given in Figure 7.

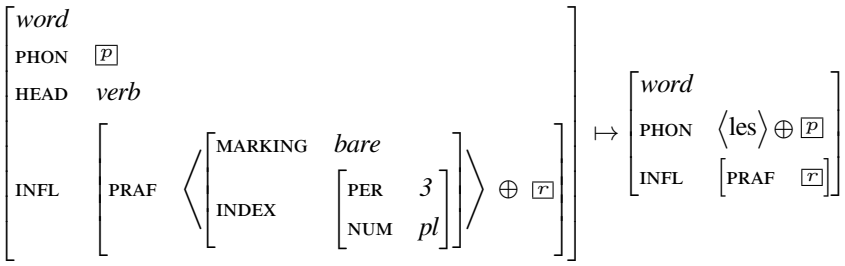

Figure 7: Inflectional lexical rule for pronominal affix *les*

Readers familiar with the approach to French clitic climbing by Miller & Sag (1997) will have noticed that so far, we follow quite closely the basic assumptions laid out in that earlier proposal: i.e. an inventory of *synsem* types that serve to constrain canonical vs. affixal and non-local argument realisation, paired with a realisational morphology. The crucial difference will become apparent in the next subsection, where we replace the argument structure-based approach of clitic climbing with an analysis in terms of morphological periphrasis.

4.2 Clitic climbing as periphrasis

The AVM in Figure 8 details the inflectional rule that derives participles with a periphrastic exponence requirement. A reverse selection constraint is created in REV-SEL, containing the input verb's PRAF list; the output's PRAF list is empty, thereby block-

[3] Alternatively, on could draw on one of the previous proposals for a realisational treatment of the French pronominal system, as outlined in Bonami & Boyé (2007) and Crysmann & Bonami (2013).

ing local realisation of pronominal arguments. To account for variation in auxiliary selection (*avoir* vs. *être*), tense selection (compositional perfective periphrase vs. non-compositional past periphrase) and form change (value of f, including agreement), corresponding rule types, all inheriting periphrastic exponence from this rule supertype, can be cross-classified along these three dimensions to properly cover all the possible cases.

$$\begin{bmatrix} \textsc{phon} & \boxed{1} \\ \textsc{head} & \textit{verb} \\ \textsc{infl}|\textsc{praf} & \boxed{2} \end{bmatrix} \mapsto \begin{bmatrix} \textsc{phon} & f(\boxed{1}) \\ \textsc{head} & \begin{bmatrix} \textsc{vform} & \textit{ppart} \\ \textsc{rev-sel} & \left\langle \begin{bmatrix} \textsc{praf} & \boxed{2} \end{bmatrix} \right\rangle \end{bmatrix} \\ \textsc{infl}|\textsc{praf} & \langle\rangle \end{bmatrix}$$

Figure 8: Lexical rule for a periphrastic participle

Tense auxiliaries can now be given the specifications in Figure 9. As already seen in Section 3, auxiliaries match their argument's (in this case a participial VP complement) REV-SEL constraint against their own INFL. Since PRAF is now part of this constraint, this means auxiliaries also inherit their PRAF list from their complement, instead of their own argument structure by means of the Argument Conservation Principle. No further constraint is required, and any pronominal affix inherited in this way will be correctly realised on the auxiliary based on the INDEX and MARKING features found in its structure.

$$\begin{bmatrix} \textit{aux-lex} & \\ \textsc{head} & \begin{bmatrix} \textsc{vform} & \boxed{2} \end{bmatrix} \\ \textsc{val}|\textsc{comps} & \left\langle \text{VP} \begin{bmatrix} \textsc{head} & \begin{bmatrix} \textsc{vform} & \textit{ppart} \\ \textsc{rev-sel} & \langle \boxed{1} \rangle \end{bmatrix} \end{bmatrix} \right\rangle \\ \textsc{infl} & \boxed{1} \begin{bmatrix} \textsc{vform} & \boxed{2} \\ \textsc{lid} & \textit{avoir-tns}\vee\textit{être-tns} \end{bmatrix} \end{bmatrix}$$

Figure 9: Lexical entry of tense auxiliary *avoir/être*

As for those periphrastic constructions that do not allow clitic climbing, the corresponding periphrastic rules (exemplified for *futur proche* in Figure 10) simply do not insert the PRAF requirement into REV-SEL, but only add a requirement for the lexical identity of the auxiliary involved, as well as TAM properties not relevant here.

The corresponding *futur proche* auxiliary is given in Figure 11, closely mirroring the entry for *avoir/être*.

A sample derivation is given in Figure 12. The rule that applies to the auxiliary is the affixation rule, that changes the form from *a* to *l'a*, and discharges the only element of PRAF; the rule that applies to the participle is the periphrastic participle inflection rule, that defers expression of PRAF to an auxiliary via reverse selection. To sum up, it

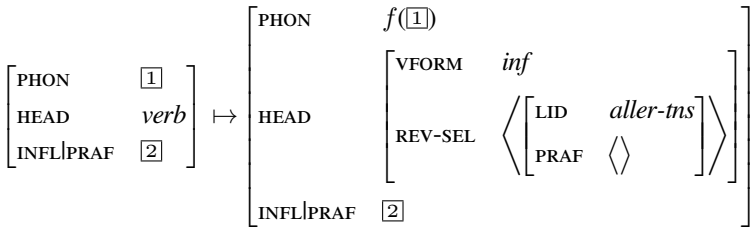

Figure 10: Lexical rule for a periphrastic infinitive

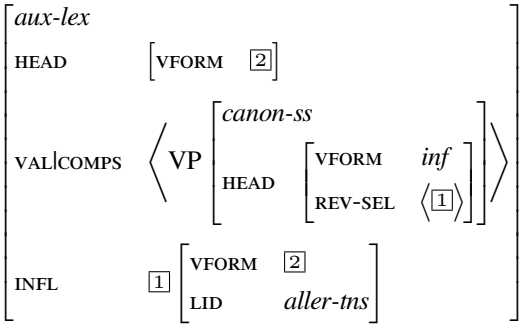

Figure 11: Lexical entry of tense auxiliary *aller*

suffices for periphrastic exponence of morphological arguments to be functional that such pronouns be given a morphological encoding accessible to periphrastic selection, in a realisational approach that separates realisation of properties from grammatical function change.

4.3 Constraints on fronting and pronominalisation

As we have discussed in Section 1 above, the main evidence in favour of a flat structure independent of clitic climbing is provided by the failure of the tense auxiliaries' complement to undergo extraction, pronominalisation, or elision, and we further observed in Section 2.1 that this property is upon closer scrutiny independent of clitic climbing.

Under the lexical, head-driven approach to unbounded dependencies (Sag, 1997; Bouma et al., 2001; Ginzburg & Sag, 2000), gaps are represented on argument structure in terms of a *synsem* type *gap-ss* distinct from that of canonically realised arguments (*canon-ss*). Thus, in order to control whether a complement can be extracted or not, it appears sufficient to constrain it to be of type *canon-ss*. Thus, by restricting the VP complement of tense auxiliaries such as *avoir/être* and *venir de/aller* to be of that type, non-extractability is readily captured.

Given that pronominalisation of French VPs is expressed by pronominal affixes, the same constraint will equally account for the pronominalisation facts, because *aff-ss* is a just another subtype of a non-canonical *synsem* (cf. Miller & Sag, 1997).

Finally, if we assume that unexpressed arguments, as found in VP ellipsis, are

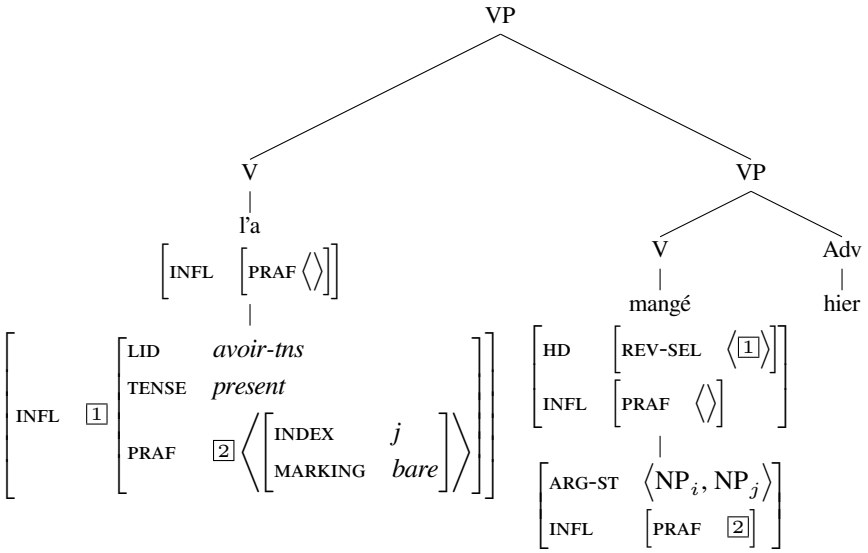

Figure 12: Percolation of periphrastic pronominal affixation

equally a case of non-canonical realisation — an assumption explicitly made in the English Resource Grammar (Copestake & Flickinger, 2000) — all three phenomena are straightforwardly accounted for by a simple constraint. In contrast to the flat structure approach, this constraint generalises across constructions with and without clitic climbing.

While auxiliary *aller/venir de* pattern with *avoir/être* in terms of canonical realisation of their verbal complement, cf. Figure 11, they do differ with respect to clitic climbing. However, this aspect is already independently controlled for by the near future periphrastic inflectional rule, which insists on local realisation of pronominal affixes, cf. Figure 10.

Modals, such as *vouloir/pouvoir*, do not permit clitic climbing, but their VP complements can extract, pronominalise or elide. Thus, their restriction regarding the *synsem* type of their verbal complement is fully relaxed, permitting resolution to *gap-ss*, *aff-ss* and *unexpr-ss*. Absence of clitic climbing is reduced to the fact that these verbs cannot serve in periphrastic expression, as indicated by the empty REV-SEL list.

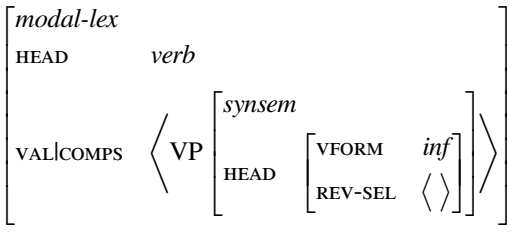

Figure 13: Lexical entry for modals (*vouloir/pouvoir*)

The passive and predicative copulas finally combine the possibility of clitic climb-

ing with canonical and non-canonical realisation of their verbal/predicative complement. While the passive auxiliary permits pronominalisation and extraction of its verbal complement, it does not permit elision, contrasting in this respect with modals.

$$\left[\begin{array}{ll} \textit{aux-lex} & \\ \textsc{val}|\textsc{comps} & \left\langle \text{VP} \left[\begin{array}{ll} \textit{expr-ss} & \\ \textsc{head} & \left[\begin{array}{ll} \textsc{vform} & \textit{ppart} \\ \textsc{rev-sel} & \langle \boxed{1} \rangle \end{array}\right] \end{array}\right] \right\rangle \\ \textsc{infl} & \boxed{1}\left[\textsc{lid} \quad \textit{être-pass}\right] \end{array}\right]$$

Figure 14: Lexical entry of passive auxiliary *être*

One case that needs some special attention is the possibility of partial fronting with passives and predicatives (Abeillé & Godard, 2002), as illustrated in (14) and repeated here as (28).

(28) Envoyée, la lettre l'a été à Marie.
sent the lettre CL$_{do}$ has been to Marie
'Sent, the letter has been to Mary.'

Most strikingly, the auxiliaries that permit partial fronting independently allow extraction of their XP complement. Conversely, auxiliaries that do not permit fronting of their VP complement, such as tense auxiliaries, do not allow partial fronting of V either. This provides further evidence that canonicity of realisation is actually a lexical property. To derive partial fronting, we shall propose a lexical rule for partial fronting that (i) restricts the verbal or predicative complement of an auxiliary to be non-canonical and (ii) raises the arguments of this complement onto its own argument structure. Such a rule is sketched in Figure 15.

Thus, we derive the connection between XP fronting and partial fronting, effectively rule out application to tense auxiliaries, which are lexically constrained to take a canonical VP complement, and avoid spurious ambiguity for in situ passives and predicatives.

$$\left[\begin{array}{ll} \textsc{head} & \left[\begin{array}{ll} \textit{verb} & \\ \textsc{aux} & + \end{array}\right] \\ \textsc{arg-st} & \left\langle \boxed{1}\,\text{NP}, \textit{non-canon} \right\rangle \end{array}\right] \mapsto$$

$$\left[\begin{array}{ll} \textsc{arg-st} & \left\langle \boxed{1}, \left[\begin{array}{ll} \textit{non-canon} & \\ \textsc{arg-st} & \langle \boxed{1} \rangle \oplus \boxed{2}\ \textit{ne-list} \end{array}\right] \right\rangle \oplus \boxed{2} \end{array}\right]$$

Figure 15: Argument-raising lexical rule (passive and predicative copula)

Under the morphological perspective we have proposed here, the treatment of clitic climbing is largely independent of the VP's constituent structure. Therefore, we can restrict argument composition to the only irrefutable case, namely partial fronting, while enjoying the advantages of a layered VP structure for coordination and modification.

5 Conclusion

Building on recent advances in the theory of inflectional periphrasis, we have argued for a fresh look on clitic climbing in French, picturing the phenomenon as a morphological dependency. We have subjected the original evidence in favour of a flat VP structure to further scrutiny and concluded that the evidence from modifier placement is inconclusive and that flat VP structures resulting from argument composition severely complicate the treatment of VP coordination. We have further shown that the impossibility to extract or pronominalise complements of auxiliaries is dissociate from the possibility of clitic climbing. Finally, we have argued that *à*-infinitivals are passive-like constructions to be treated in terms of simple subject raising.

In our analysis, which builds on Bonami (2015), we use inside-out selection to model periphrastic exponence of both tense and argument realisation. While this morphological perspective is fully in line with the morphological status of French pronominal affixes (Miller, 1992; Miller & Sag, 1997), including boundedness of climbing, it is at the same time compatible with a layered VP structure, simplifying the analysis of VP coordination in analytic tenses. Finally, we suggested that the extraction and pronominalisation facts found with tense auxiliaries can be captured straightforwardly by means of the distinction between canonical and non-canonical synsem objects.

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