10

A Dynamic Account of Clitic Climbing: A first sketch

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In this chapter,, I propose an account of Clitic Climbing within the lines of the Dynamic Syntax framework. I argue that once we shift into a dynamic model of syntax, the so-called *restructuring* phenomenon as well as the *functional-lexical* distinction (Cinque, 1999, 2001, 2006; Cardinaletti and Shlonsky, 2004) receive a straightforward explanation. Following, Cann's (this volume) analysis of English auxiliaries (and some of the modals), I assume that restructuring verbs do not project any verbal type value, but only the higher situation nodes. Then, the semantics of restructuring verbs are captured inside the complex situation argument node, by further introducing a world parameter as part of a complex situation formula value containing both a situation and a world parameter. Clitic climbing is then predicted to be possible, in the same sense it is possible with auxiliary verbs (actually it is the only option in this case). Multiple climbing will be shown to be easily captured under the same analysis, assuming that more than one restructuring verbs will not project any verbal type value but will rather project information inside the complex situation argument node. As regards unavailability of negation in restructuring contexts, it will be shown that negating the infinitive in these environments is ungrammatical for

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the same reason negation always precedes lexical and auxiliary verbs in the language examined (Italian).

10.1 Introduction

Clitic Climbing (CC) is one of the phenomena associated with clitics that has received considerable attention within the syntactic literature (Rizzi 1982; Kayne 1989; Miller and Sag 1997; Monachesi 1998, 1999; Cinque 2001, 2006; Cardinaletti and Shlonsky 2004 among others). CC basically refers to a syntactic construction, in which the clitic(s) seems to appear in a domain where no argumental relation with the verb of that domain is established. In effect, the core of the problem can be summarized as a local domain violation, since one basic property of clitics, i.e. the fact that these appear and are interpreted in the local domain of their host, is violated in CC environments. The examples below from Italian and Spanish respectively illustrate the latter point:

(10.1) *Lo voglio comprare*
it want.1SG buy.INF
'Maria wants to buy it.'

(10.2) *Maria lo quiere comprar*
Maria it wants buy.INF
'Maria wants to buy it.'

Example (10.1) and (10.2) are examples of this domain violation. However, the structures in (10.3) and (10.4), where the clitic appears inside its domain of interpretation, are equally grammatical:

(10.3) *Voglio comprarlo*
want.1SG buy.INF-it
'I want to buy it.'

(10.4) *Maria quiere comprarlo*
Maria wants buy.INF-it
'Maria wants to buy it.'

The problem would be easily solvable if clitics had in general the ability to appear in different domains with all types of verbs. However, CC is only possible with a specific number of verbs that have traditionally been called *restructuring verbs* (Rizzi 1982, and practically any analysis within the GB/Minimalism tradition). This latter term refers to modal, aspectual and motion verbs. Clitic Climbing is not possible with any other verbs, as witnessed in the examples from Italian below:

(10.5) **Maria lo prova di comprare*
Maria it tried COMP buy.INF
'Maria wants to buy it.'

(10.6) *Lo detesto vedere in quello stato
him detest see.INF in that state
'I detest seeing him in that state.'

The earliest approaches within the generative tradition (Rizzi 1982) consider CC as a side-effect of restructuring, a process of structure simplification in which a biclausal structure is turned into a monoclausal one by means of a restructuring rule (formalization is mine):

(10.7) $\mathrm{VP}_{Rstr}\ \mathrm{V}_{inf} \rightarrow \mathrm{V}_{complex}$

The above rule transforms a biclausal structure involving a restructuring verb and an infinitive, into a monoclausal one where the two verbal elements are reanalyzed as a verbal complex.

The newest minimalist approaches, on the other hand (Cardinaletti and Shlonsky 2004; Cinque 2001, 2006), consider CC to occur when the climbing inducing verb appears not as a fully fledged verb heading its own VP but rather as a functional verb, i.e. as the lexical instantiation of an FP within the richly articulated FP clausal structure proposed by Cinque (1999):

- [CP... [FP... [FP V_{restr} [FP... [VP V]]]]] - Climbing case
- [CP... [FP... [FP[VP V_{restr} [CP... [FP... [FP[VP V]]]]]]] - Non-climbing case

Within HPSG, CC has been considered to be an argument-sharing phenomenon (Miller and Sag 1997; Monachesi 1998, 1999 among others). The assumption is that the climbing inducing verb subcategorizes for an infinitive plus its arguments:

(10.8)
$$\begin{bmatrix} \text{HEAD V} \\ \text{VCLASS modal} \vee \text{aspectual} \vee \text{motion} \\ SUBJ\langle NP \rangle \\ \text{COMPS L} \oplus \langle\ \text{V} \begin{bmatrix} \text{CLTS}\ \{\} \\ \langle\ \text{NP}\ \rangle \\ \text{COMPS L} \end{bmatrix} \rangle \end{bmatrix}$$

Argument sharing explains why the clitic can climb in CC constructions but does not however have anything to say with respect to restructuring effects found in CC environments like, for example, unavailability of infinitival negation when CC has taken place (example below from Italian):

(10.9) *Lo vuole non vedere
it.CL-ACC want NEG buy.INF
'I want to not see it.'

(10.10) *Vuole non vederlo*
want NEG buy.INF it.CL-ACC
'I want to not see it.'

Furthermore, it is not clear what subcategorization for an infinitive plus its arguments means and furthermore why non-restructuring verbs are unable to appear with this kind of subcategorization.

It is worth emphasizing, that the common denominator in all these approaches is the implicit or explicit assumption that CC constructions are monoclausal rather than biclausal (see Cinque 2006 for extensive argumentation on the monoclausal hypothesis). I will assume that this assumption is indeed true and using the DS framework, I will try to provide a dynamic analysis where CC directly follows and the functional vs non-functional distinction is captured in dynamic terms.

10.2 Theoretical preliminaries

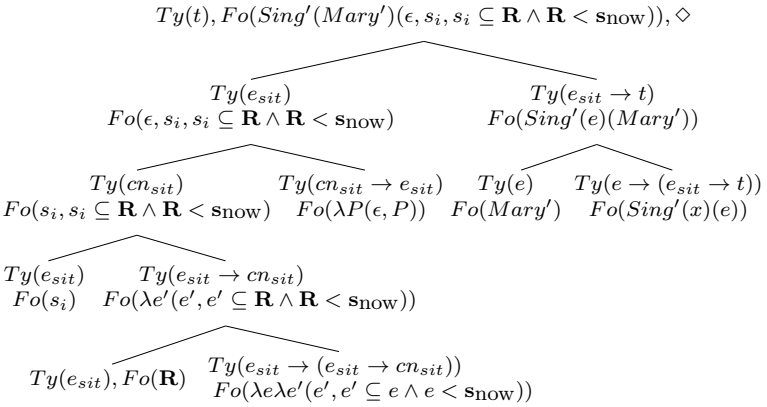
The version of the DS framework I'm going to use has its basis in the version presented in Cann et al. (2005). I further assume a situation argument being present in the tree structure functioning as the locus where tense and aspect properties are encoded. Building on assumptions by Gregoromichelaki (2006, this volume) and Cann (this volume), this situation argument node is assumed to be of the general type e, but further specified as e_{sit} (with *sit* standing for situation).[1] Furthermore, the situation argument node, in line with the standard analysis of quantificational NPs (Kempson et al. 2001; Cann et al. 2005), is assumed to involve complex structure. All these assumptions are depicted in the tree structure representing the complete parse of the English sentence *Mary sang* adapted from Cann (this volume), as shown in (10.11).

In (10.11), the intransitive verb *sing* is taken to be a two-place predicate, subcategorizing for both a subject and an event/situation argument. In the lowest e_{sit} node, the reference time metavariable $\mathbf{R}$ is introduced. This will combine with the semantic specifications given for the past tense in the lowest functor node ($Fo(\lambda e \lambda e'(e', e' \subseteq e \wedge e < \mathbf{s}_{\text{now}}))$), to return a formula value in which the first lambda bound variable, e, is substituted by $\mathbf{R}$, the reference time, ($Fo(\lambda e'(e', e' \subseteq \mathbf{R} \wedge \mathbf{R} < \mathbf{s}_{\text{now}}))$). This new formula states that the event indicated by the other lambda bound variable e' is contained within or holds at $\mathbf{R}$ ($e' \subseteq \mathbf{R}$) which precedes the utterance time ($\mathbf{R} < \mathbf{s}_{\text{now}}$). In the intermediate e_{sit} node, a situation variable s_i is introduced. This variable will substi-

[1] Under this approach the general type e can have subtypes e_{sit}, e_i for individuals, e_w, for worlds etc. In what follows only *sit* subscripts will appear for simplicity. The same applies to type *cn*.

tute the remaining lambda bound variable (e') to return the formula value $Fo(s_i, s_i \subseteq \mathbf{R} \wedge \mathbf{R} < \mathbf{s}_{\text{now}})$, in effect providing a situation that will satisfy the given tense/aspect specifications:

(10.11) Parsing *Mary sang*



The last step involves quantifying over the last formula obtained. In the example above, the restrictor specifying a set of situations is combined with, in effect, an existentially quantifying binder, ϵ, to return a formula value which roughly states that such a past situation exists ($Fo(\epsilon, s_i, s_i \subseteq \mathbf{R} \wedge \mathbf{R} < \mathbf{s}_{\text{now}})$). At the end of the parse, the formula value of the complex situation argument node will combine via functional application with the situation functor node of type $Ty(e_{sit} \rightarrow t)$ to return the well-formed type t formula $Fo(Sing'(Mary')(\epsilon, s_i, s_i \subseteq \mathbf{R} \wedge \mathbf{R} < \mathbf{s}_{\text{now}}))$.[2] Lastly, note that the situation argument node along with the containing tense-aspect information is assumed to be directly projected from the verb in this case. In other instances, partial tense and aspect information can be provided by auxiliary verbs, infinitives or even modality and subjunctive markers (see e.g. Chatzikyriakidis forthcoming).

[2]The reference time $\mathbf{R}$, being a metavariable, needs to be substituted by a proper value given standard DS assumptions (Kempson et al. 2001; Cann et al. 2005 among others). The assumption is that the reference time metavariable gets a proper value according to context. As Cann (this volume) argues this reference time metavariable can range not only across times but also events or even worlds, and is always contextually determined. I will not deal with the details of substituting the metavariable $\mathbf{R}$ here. It should however be kept in mind that a complete analysis of tense/aspect will have to take care of this substitution as well.

10.3 A Dynamic account of clitic climbing

10.3.1 Clitics in DS

A number of analyses have been proposed for various clitic properties in DS (Bouzouita 2008a,b; Chatzikyriakidis 2009a, 2009b, forthcoming; Chatzikyriakidis and Kempson 2010; Gregoromichelaki, to appear). In all these analyses, positioning restrictions are defined as restrictions on the current parse state, while the actions projected by the clitic vary according to the level of underspecification involved in each case. For example, 1st/2nd person accusative clitics in Spanish have been analysed as projecting locally unfixed nodes (Cann and Kempson 2008; Chatzikyriakidis and Kempson 2010), a proposal largely motivated by the morphological syncresis of these clitic forms. On the other hand, 3rd person accusative clitics in the same language are treated as projecting fixed structure, in effect building and decorating the direct object node with a type value and a formula metavariable. There are a number of interesting predictions that such a proposal makes, especially with respect to the Person Case Constraint (PCC), but this is something that will not concern us here (see Cann and Kempson (2008) and Chatzikyriakidis and Kempson (2010) for an analysis of the PCC in DS). In this chapter, I will use the Italian 3rd person accusative clitic *lo* as an exemplar and I will not deal with clitic clusters or person case restrictions. The language used will be Italian but the same account is easily extendable to other CC languages as well, e.g., Spanish, Catalan (see also Chatzikyriakidis (forthcoming) for a DS analysis of obligatory climbing in Grecia Salentina Greek). As already stated, positioning restrictions are defined as restrictions on the current parse state. For example, the trigger shown below effectively captures proclisis in Italian:[3]

(10.12) Proclisis trigger:

IF	$?Ty(t)$		
THEN	IF	$[\downarrow^+]Tn(a), ?Ty(x)$	
	THEN		...
ELSE	Abort		

The above reads as follows: If the pointer appears at a node with a type t requirement, then, if all fixed nodes (nodes with a Tn address) below that node bear a type requirement, then the clitic can be parsed. This ensures that no verbal element has been parsed yet, since, if it had, we would have at least one fixed node with its type.[4] The next step is

[3] This is a general proclitic trigger and as such will work for languages with similar clitic positioning restrictions (Spanish, Greek, French to name a few).

[4] Note that such an entry will also correctly predict *lo* to be possible after dative clitics in clitic clusters like *me lo*. Assuming that *me* will project an unfixed node

to define the actual actions projected by the clitic. Given a fixed node analysis for 3rd person accusative clitics, *lo* will basically build the direct object node, project a type value and a formula metavariable on that node and return the pointer to the most local type t node above it ($gofirst(?Ty(t))$). Furthermore, an additional trigger is added, specified as a disjunction (OR) in the embedded IF part of the algorithm, positing that the clitic can also be parsed in case an infinitival or an imperative feature is present in the type t requiring node:[5]

(10.13) Lexical entry for the third person accusative clitic *lo*[6]

IF $?Ty(t)$
THEN IF $[\downarrow^+]Tn(a), ?Ty(x)$
OR
IF $(+INF \vee +IMP)$
THEN $\texttt{make}(\langle\downarrow_1\rangle); \texttt{go}(\langle\downarrow_1\rangle);$
$\texttt{make}(\langle\downarrow_0\rangle); \texttt{go}(\langle\downarrow_0\rangle)$
$\texttt{put}(Ty(e), Fo(U_x), ?\exists \mathbf{x}.Fo(\mathbf{x}),$
$gofirst(?Ty(t)))$
ELSE Abort

Having sketched the way clitics are treated in DS, it is time to move to the actual analysis of CC in DS.

10.3.2 The analysis

Given the lexical entry for clitics in (10.13) if we assume a biclausal analysis of clitic climbing where the climbing inducing verb subcategorizes for a verbal complement, climbing is predicted to be ungrammatical. This is because parsing of the clitic involves the projection of a type value at the direct object node, a node already containing a type t requirement projected by the climbing inducing verb. In (10.14)[7], the clitic has been parsed first, decorating the direct object with a type e value. However, the existing type t requirement will disallow any well formed parse of the sentence, since in case the type t requirement gets

(following Cann and Kempson 2008; Chatzikyriakidis and Kempson 2010), the clitic *lo* can be parsed.

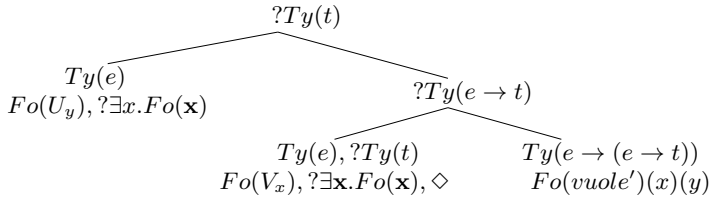
[5]Note that the features +IMP, +INF are used here as DS diacritics and do not constitute a serious attempt to give an analysis of imperatives and infinitives.

[6]The subscript x in the formula metavariable **U** stands for the restrictions on metavariable update that a third person clitic, and in general any third person metavariable, will bear. These will not be specified here but will have to be assumed in a more complete analysis to prevent overgeneration, e.g., avoiding a situation where *lo* is updated by a formula value specified as female. First/second person metavariable restrictions will be denoted as Sp' and Hear', standing for Speaker and Hearer respectively, again pending a more complete analysis.

[7]The higher situation node is not shown here for ease of exposition.

satisfied a type conflict will occur, whereas if it does not, an oustanding requirement will exist in the tree structure.

(10.14) Parsing *vuole* in *lo vuole comprare* 'it-wants to-buy'



However, as already mentioned, the stance I'm going to take here is that CC involves a monoclausal rather than a biclausal structure, following pretty much everyone in the literature (with the exception possibly being Kayne 1989). Hence, the first thing to look at is how a monoclausal approach to the phenomenon can be pursued. A promising way of approaching the problem is to examine whether other constructions involving monoclausal verbal complexes exhibit climbing. A positive answer comes from perfect constructions in languages like Italian/Spanish (also non-climbing languages, e.g. Greek). In these languages, perfect verbal complexes comprised of an auxiliary verb and the past participle always involve attachment of the clitic to the left of the auxiliary rather than attachment to the past participle:

(10.15) *Gianni l' ho mangiato*
Gianni it$_{\text{CL-ACC}}$ have eaten
'Gianni has eaten it.' [Italian]

(10.16) **Gianni ho (lo) mangiato (lo)*
Gianni have it$_{\text{CL-ACC}}$ eaten it$_{\text{CL-ACC}}$
'Gianni has eaten it.' [Italian]

(10.17) *Juan lo ha comido*
Juan it$_{\text{CL-ACC}}$ have eaten
'Gianni has eaten it.' [Spanish]

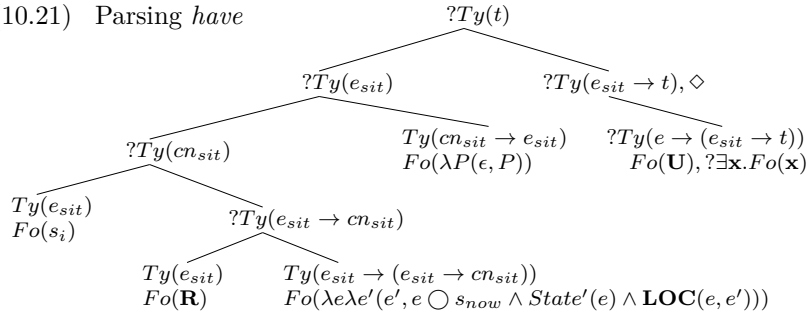
(10.18) **Juan ha (lo) comido (lo)*
Juan have it$_{\text{CL-ACC}}$ eaten it$_{\text{CL-ACC}}$
'Gianni has eaten it.' [Spanish]

(10.19) *O Janis to ehi fai*
Gianni it$_{\text{CL-ACC}}$ have eaten
'Gianni has eaten it.' [Greek]

(10.20) **O Janis ehi (to) fai (to)*
Gianni have it$_{\text{CL-ACC}}$ eaten it$_{\text{CL-ACC}}$
'Gianni has eaten it' [Greek]

The main DS assumption behind auxiliaries in English is that these are basically content placeholders (Cann, this volume) projecting their tense and aspect information in the situation argument node. A formula metavariable, $Fo(\mathbf{U})$, is further projected at the predicate node. This will predict that auxiliaries can also appear in VP-ellipsis environments, since update of the predicate formula metavariable can be achieved via substituting a formula value available in the context. The effect of parsing the English auxiliary *have* under Cann's analysis is shown in (10.21), below:[8]

(10.21) Parsing *have*



The above analysis can be extended to auxiliaries in Italian with minor modifications. The first modification would involve getting rid of the formula metavariable in the predicate node and possibly getting rid of the whole predicate node. This is because having a formula metavariable in the predicate node predicts that auxiliaries in Italian can appear in VP-ellipsis environments, similarly to English, which is contrary to fact:

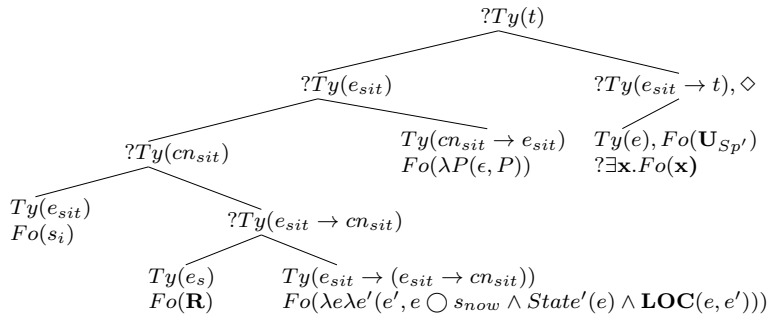
(10.22) *Hai chiamato Gianni? *Si, ho*
have called John yes have-I
'Have you called John? Yes, I have.' [Italian]

The other thing that needs to be taken care of is the subject pro-drop properties associated with Italian. This can be easily accommodated assuming that the auxiliary will also project a type e value and a formula metavariable in the subject node. This is a plausible assumption since all agreement information in Italian is encoded on the auxiliary rather than the past participle. The formula metavariable needs to be updated by a proper formula by the end of the parse. This can be done by the context (covert subject or object) or from the natural language string itself (overt subject or object). In case the verb is comprised of more than one element, one of the two should project the subject information.

[8] See Cann (this volume) for details on the semantic specifications of *have*.

It seems plausible to assume that this information will be contributed by the element that exhibits agreement information, i.e. the auxiliary in our case.[9] Putting these two assumptions together we end up with the following tree, depicting the result of parsing the Italian auxiliary *ho* 'have':

(10.23) The effect of parsing *ho* 'have.1sg' in Italian



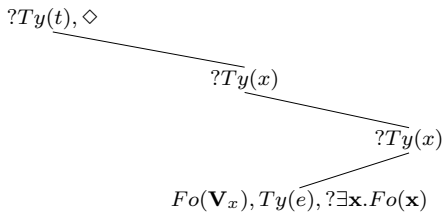
Having processed this lexical entry, the pointer is left at the node that will be annotated with a functor over situation arguments. At this point, the past participle can be parsed. I will not go into the exact details of how the lexical entry for past participles will look, however, following Cann (this volume) I assume that past participles have a $Ty(e_{sit} \rightarrow t)$ requirement as their triggering point. This will basically predict climbing to be obligatory with auxiliary constructions in Italian, as is in fact the case. Let us explain. Say we begin with the grammatical auxiliary climbing example shown below:

(10.24) *L'* *ho* *comprato*
it have.1SG bought
'I have bought it.'

The clitic is parsed first, giving rise to the structure in (10.25).

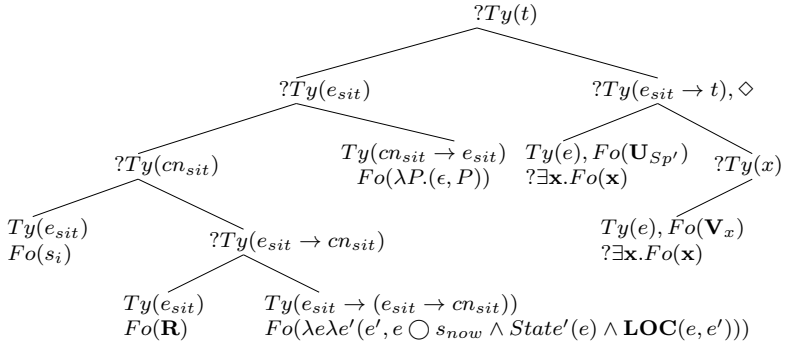
[9] There are no consequences for the account given if we assume that the participle and not the auxiliary is projecting the subject information.

(10.25) Parsing *lo* in *L' ho comprato* 'I have bought it'



With the pointer at the type t requiring node, the auxiliary can be parsed, projecting the situation argument nodes plus the subject node decorated with a type value and formula metavariable (10.26).

(10.26) The effect of parsing *ho* 'have.1sg' in *L' ho comprato* 'I have bought it'



The pointer is at the type $e_{sit} \rightarrow t$ node and thus the past participle can be parsed. Given that the past participle will provide a transitive type and a predicate formula value in the lowest functor node, the parse will turn out to be grammatical, assuming that the metavariables projected by the clitic (in the object node) and the auxiliary (in the subject node) will be updated by proper formula values provided by the context in this case.[10] On the other hand, as a consequence, both (10.27) and (10.28) are predicted to be ungrammatical:

(10.27) **Ho* *lo* *comprato*
have.1SG it bought
'I have bought it.'

(10.28) **Ho* *comprato* *lo*
have.1SG bought it
'I have bought it.'

[10] See Cann (this volume) for a lexical entry of past participles in English.

In the first of the two examples, the auxiliary is parsed, leaving the pointer at the type $e_{sit} \rightarrow t$ requiring node. However, this node does not satisfy the initial trigger of the clitic ($?Ty(t)$), and thus the parsing process stops there.[11] In the case of (10.28), the clitic comes into parse after both the auxiliary and the past participle have been first parsed. What we have not yet shown is the node where the pointer will be left after the past participle is parsed. However, whatever our assumption with respect to the position of the pointer after the past participle has been parsed, parsing of the clitic afterwards will be impossible. Assuming the pointer is left at the type $e_{sit} \rightarrow t$ requiring node, the clitic cannot be parsed for the same reason it cannot be parsed after the auxiliary in (10.27), i.e. because the initial trigger of the clitic ($?Ty(t)$) is not satisfied. Assuming the pointer is left at the type t requiring node, the clitic again cannot be parsed, since there will be at least one node bearing a type value (the predicate type projected by the past participle), and thus the embedded trigger of the clitic will not be satisfied ($[\downarrow^+]Tn(a), ?Ty(x)$). Lastly, assuming the pointer is left at the object node (as Cann (this volume) actually assumes for English participles), the initial clitic trigger ($?Ty(t)$) will again not be satisfied, and thus the parse will abort.[12] Thus, the only option in auxiliary constructions is obligatory climbing of the clitic, i.e. attachment of the clitic to the auxiliary and not the past participle.

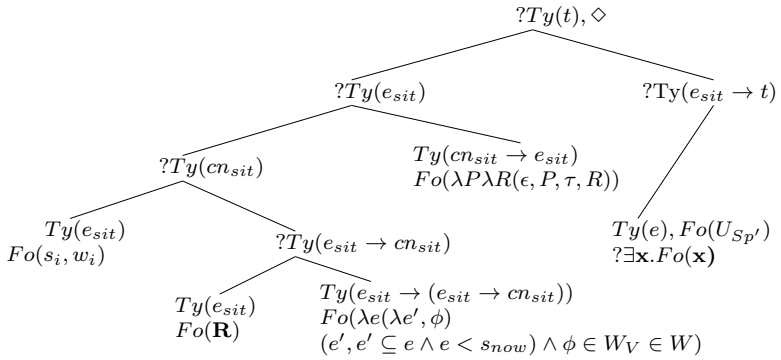
Given the analysis just sketched for auxiliaries, I would like now to propose that a straightforward account of CC can be put forth in case one assumes that restructuring verbs are parsed as auxiliary-like verbs. Under this proposal, restructuring verbs do not project any verbal type value but only the higher situation nodes plus the subject node. The claim is intriguing but needs to be further refined, since restructuring verbs, unlike auxiliary verbs, are contentful. Treating restructuring verbs in exactly the same way as auxiliaries will give us an incorrect semantic interpretation, since the semantics contributed by these verbs will not be encoded anywhere. So, in pursuing such an analysis, we will have to find a way to capture the semantic properties of these verbs without having to project any verbal predicate type node. Hopefully, there is a straightforward way to do this that will furthermore retain the core of the auxiliary analysis. Following a proposal by Ronnie Cann (p.c.), I will basically assume that the formula value of the intermediate e_{sit} node, introduces a complex formula value comprised of both a situation and a world parameter ($Fo(s_i, w_i)$). Then,

[11] Note that the pointer cannot move up via COMPLETION in this case, since no type or formula requirement has been satisfied at that node.

[12] Again, movement via COMPLETION is impossible.

the $e_{sit} \rightarrow (e_{sit} \rightarrow cn_{sit})$ node, besides carrying tense/aspect specifications, will be further annotated with world information. For example, in the case of *voglio* 'want', the variable which will combine with the world parameter will be specified as belonging to the set of all volitional contexts (W_V), which in turn are a subset of the set of contextually accessible worlds (W). This world specification will then be universally quantified to roughly return the following reading: there is a situation satisfying the given tense and aspect specifications in all volitional contexts that are a subset of the set of contextually accessible possible worlds. Accordingly, the structure we get after parsing *voglio* is shown below (10.29):

(10.29) Parsing *voglio* 'want.1SG'

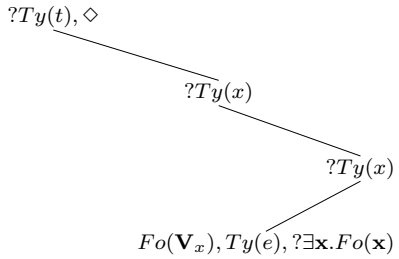


Notice that the pointer is assumed to return to the initial type t requiring node. We have seen that the pointer is left at the situation functor node after an auxiliary has been parsed. However, leaving the pointer at the situation functor node in the case of restructuring verbs will basically predict that infinitives have two distinct parsing triggers, a type t and a type $e_{sit} \rightarrow t$ requiring trigger. The type t requiring trigger is independently needed for constructions where the infinitive functions as the complement of a regular complement taking verb. In that case, and assuming that the complement taking verb will decorate the direct object node with a type t requirement and will leave the pointer there with no other nodes existing below that node, the trigger for the infinitive must be the type t requiring node. In order to avoid redundancy, I posit that the trigger for infinitives is a type t requiring node in all cases.[13] This is actually all we need in order to capture the clitic climbing phenomenon. In fact, these assumptions suffice to

[13] A welcome result of this assumption is that it enables us to distinguish between infinitives and past participles without actually referring to any of their properties. For example, under such an analysis, an infinitive will always be impossible after an

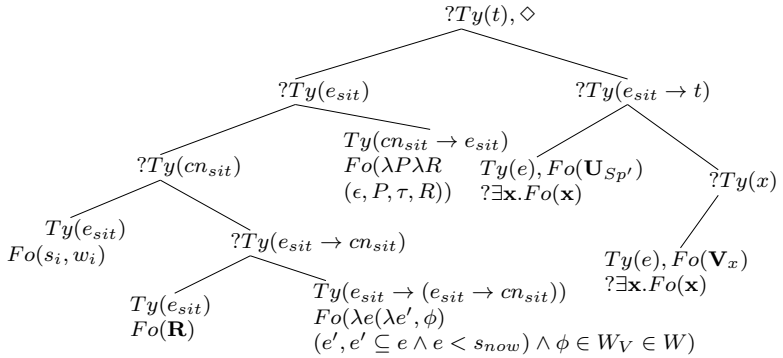
predict both the climbing and the in situ case. Let us see how. Say, we want to parse *lo voglio comprare* 'I want to buy it'. We first parse the clitic (10.30):

(10.30) Parsing *lo* 'it' in *lo voglio comprare* 'I want to buy it'



The pointer is then at the type t requiring node. The restructuring verb can now be parsed, projecting the situation nodes plus the subject node (10.31):

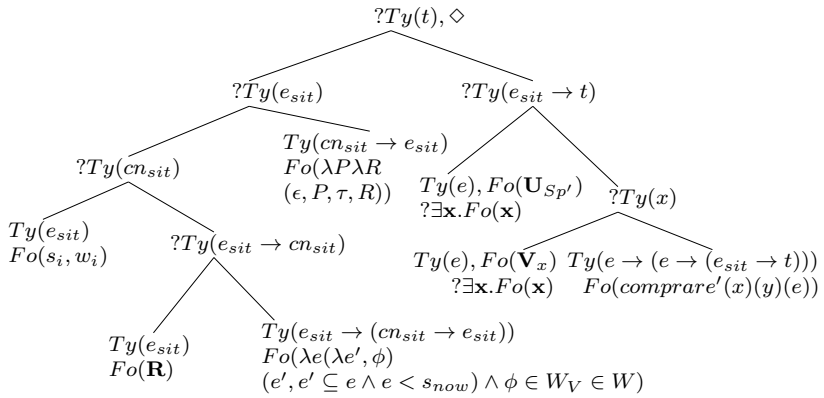
(10.31) Parsing *voglio* in *lo voglio comprare*



The pointer is again at the type t requiring node. The infinitive comes into parse, projecting the verbal predicate type plus a formula value (10.32):

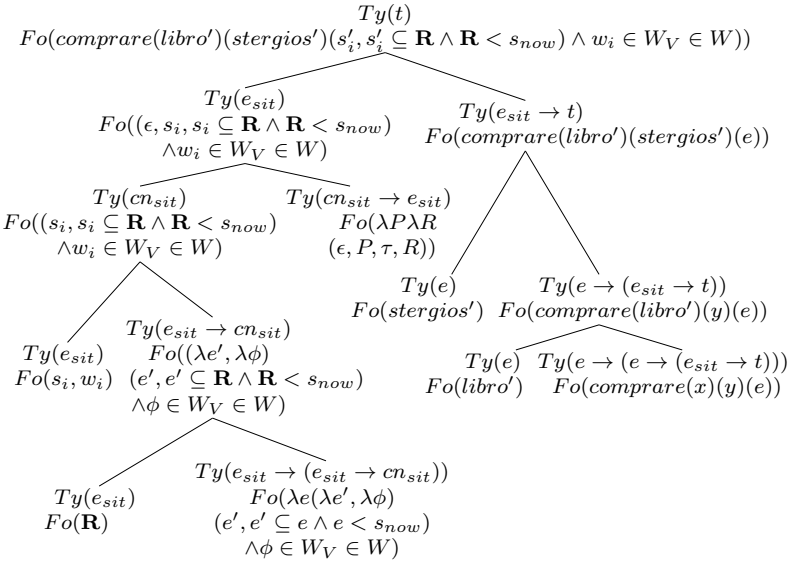
auxiliary has been parsed first, since the pointer in that case will be at the situation functor node.

(10.32) Parsing *comprare* in *lo vuole comprare*



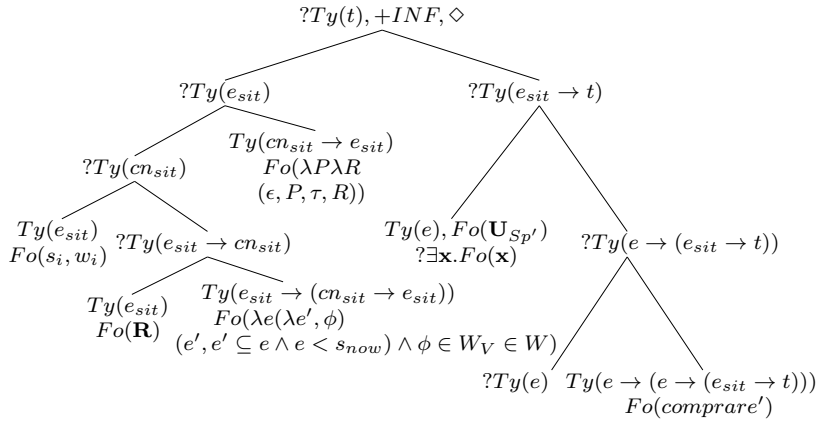
Assuming that the formula metavariables in the object and subject node are substituted by proper values, modus ponens and functional application lead to a well-formed parse:

(10.33) Completing the parse



The in situ case (10.3) is also correctly captured in the following way: The restructuring verb plus the infinitive are parsed first. The infinitive annotates the type t node with a +INF specification. The pointer is left at the type t requiring node. The clitic comes into parse and since its second trigger is satisfied ($(+INF \vee +IMP)$), parsing of the clitic is possible (10.34):

(10.34) Parsing *voglio comprar(e)* 'I want to buy' in *voglio comprarlo* 'I want to buy it'



On the other hand, the case where the clitic is parsed in between the restructuring verb and the infinitive is predicted to be ungrammatical. This is because after the restructuring verb is parsed, a fixed node with a type value will exist (the subject node), and thus the clitic's embedded trigger, i.e. $[\downarrow^+]Tn(a), ?Ty(x)$, will not be satisfied. One of the consequences of the above account (and any monoclausal account in general) is that restructuring verbs cannot be control verbs anymore. This is because no subject is controlled but rather both the verb and the infinitive share the same subject. This has already been noted in the literature by Cinque (2006: 21) who argues that even apparent control cases like *want*, inherit their subject from the embedded lexical verb and thus are not control phenomena. In our case, no such inheritance is necessary, since both the restructuring verb and the infinitive share the same subject, but the intuition that restructuring does not involve control is common to both accounts.

Multiple verb climbing

Climbing is possible across more than one restructuring verb. Climbing to an intermediate position is also an option:

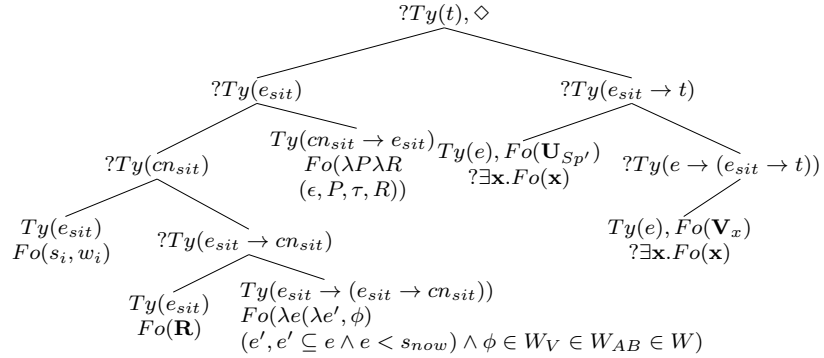
(10.35) *Lo voglio poter comprare*
it want be-able to-buy
'I want to be able to buy it.'

(10.36) *Voglio poterlo comprare*
want be-able-it to-buy
'I want to be able to buy it.'

(10.37) *Voglio poter comprarlo*
want be-able to-buy-it
'I want to be able to buy it.'

In the above examples, a restructuring infinitive (*poter*) is present along with the restructuring verb *voglio*. I assume that a restructuring infinitive, in the same sense as restructuring verbs, will not project any verbal predicate type but instead its semantics will be captured in the situation argument node. However, no situation or world parameter will be introduced by the restructured infinitive in the intermediate e_{sit} node, since these will have been introduced by the restructuring verb.[14] Its contribution will involve restricting world information associated with the world parameter (modal verbs) or the tense/aspect properties of the situation parameter (e.g. in the case of aspectual verbs). The exact formal details of such a proposal will not be fleshed out here (see Chatzikyriakidis 2009a for a lexical entry of restructuring infinitives), what is crucial here is that multiple climbing uses the exact same mechanisms as single CC. For example, after parsing the clitic in (10.35), the restructuring verb comes into parse providing a complex situation argument involving both a situation and a world parameter. The world parameter specification indicates that the situation must exist in all accessible volitional contexts which are a subset of the set of contextually accessible worlds. Then the restructuring infinitive follows, further restricting the world parameter by positing that the set of volitional contexts must be a subset of the set of ability contexts (W_{AB}) which in turn are a subset of the set of contextually accessible worlds (10.38):

(10.38) Parsing *poter* in *lo voglio poter comprare*



[14] However, there are cases where a restructuring infinitive is the only restructuring verbal element. For these cases see Chatzikyriakidis (2009a) for an analysis.

The rest follows as in single verb climbing. Note that the clitic can be also parsed in the intermediate position, since a +INF feature will exist after the restructured infinitive will be parsed. Thus, multiple climbing is captured in our account using the same mechanisms as in single verb climbing.

Unavailability of negation

One of the phenomena associated with CC is the unavailability of negating an infinitive in case CC has taken place. The relevant data are shown below:[15]

(10.39) **Lo* *vuole* *non* *vedere*
it$_{\text{CL-ACC}}$ want NEG buy$_{\text{INF}}$

(10.40) *Vuole* *non* *vederlo*
want NEG buy$_{\text{INF}}$-it$_{\text{CL-ACC}}$

The account proposed here for CC gives an immediate explanation for the phenomenon just sketched. Unavailability of negating an infinitive in CC contexts will be captured using the same mechanism one must use in order to capture the fact that negation is always preverbal in languages like Italian. Since restructuring verbs are analyzed on a par with auxiliary verbs, the explanation for the preverbal positioning of negation and the unavailability of negating an infinitive in CC environments will boil down to the same explanation: the specification of the negative element, contributing sentential negation, will have to ensure that no verb or auxiliary has already been parsed. Thus, what we really need is a trigger capturing the fact that negation must be preverbal no matter what kind of verb will follow. The following trigger introduces a lexical specification for negation that aborts in case any fixed nodes are present in the tree structure:

(10.41) Lexical entry for sentential negation
IF $?Ty(t), [\downarrow^{+}]\exists \mathbf{x}.Tn(\mathbf{x})$
THEN ... neg-content...
ELSE Abort

The above entry will correctly capture preverbal positioning of negation with content and auxiliary verbs alike. Thus, unavailability of negation in CC contexts is also predicted: assuming that a restructuring verb has been parsed, a number of fixed nodes will have been projected. Then,

[15] A counterexample is the case of *sembrare* in Italian, where negation does not seem to block CC in that case. See Cinque (2006) for the relevant data and argumentation.

if negation appears next, its trigger cannot be satisfied, and the parse aborts.

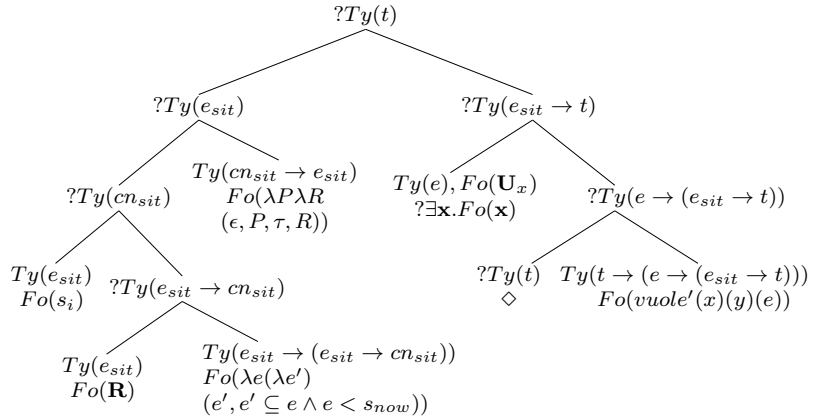
The grammatical example in (10.39) is captured, assuming, in line with Cinque (2001) and Cardinaletti and Shlonsky (2004), that restructuring verbs come in two guises, one functional and one lexical. The latter can only give rise to non-climbing configurations, while the former can give rise to both CC and non-CC constructions.[16] In DS terms, this structural duality is expressed as a disjunction in the entry of restructuring verbs. A lexical entry for a restructuring verb will involve a disjunction in the THEN part of the algorithm that will specify two different sets of actions, one for the functional, auxiliary-like version and one for the lexical version of the restructuring verb. Hence, the entry for the restructuring *voglio* will involve a structure like the one shown below:

(10.42) Lexical entry template for restructuring verbs

IF	?Ty(t)
THEN	**Functional actions**
OR	
THEN	**Lexical actions**
ELSE	Abort

Assuming the above lexical entry template for restructuring verbs, the grammaticality of (10.39) is captured in case the restructuring verb is parsed as a lexical verb. The structure obtained after *vuole* is parsed as a regular lexical verb is shown below (10.43):

(10.43) Parsing *vuole* in *vuole non vederlo*



[16] See Cardinaletti and Shlonsky (2004) and Cinque (2006) for the relevant argumentation and examples.

Parsing *vuole* as a lexical verb will result in the projection of a verbal type, specified as $Ty(t \rightarrow (e \rightarrow (e_{sit} \rightarrow t)))$, along with a type t requirement at the object node. Furthermore, only a situation and no world parameter is projected by the actions of lexical *vuole*, since the semantics of the verb are now captured regularly via the formula value in the transitive functor node ($Fo(vuole'(x)(y)(e))$). The pointer is left at the embedded type t requiring node. It is at this point that sentential negation is processed. As shown in (10.41), its lexical entry specifies that in order to be parsed, all nodes below the current one must be unfixed. The universal statement involved here will be trivially true in the presence of the empty set, i.e. in cases where no nodes are present below the current node. This is indeed the situation we find in the structure (10.43) above, and thus lexical negation can be parsed after *vuole* has been processed as a lexical verb.

10.4 Conclusion

In this chapter, I have presented a first sketch of a DS account of CC. I have argued that the phenomenon of CC can receive a straightforward explanation once one shifts into a dynamic perspective. In particular, I provided an analysis of restructuring verbs in line with auxiliary verbs. Under this analysis, restructuring verbs do not project a verbal type but rather project their semantic contribution inside the complex situation argument node. This last assumption straightforwardly captures the phenomenon of CC. Multiple climbing is then captured using the exact same mechanisms, the difference being that more than one verb project semantic information in the situation argument node. Finally, the unavailability of negating an infinitive is explained as a simple word order phenomenon, and it is captured by the same device used to capture the fact that negation precedes all types of verbs, both content and auxiliary in CC languages like Italian. Since restructuring verbs receive an analysis in line with auxiliary verbs, negation is only possible before the restructuring verb, while the option where negation precedes the infinitive is predicted to be illicit.

References

The following were cited in this chapter: Bouzouita (2008a,b), Cann (this volume), Cann and Kempson (2008), Cann et al. (2005), Chatzikyriakidis (2009a,b, forthcoming), Chatzikyriakidis and Kempson (2010), Cinque (1999, 2001, 2006), Cardinaletti and Shlonsky (2004), Gregoromichelaki (2006, this volume, to appear), Kayne (1989), Kempson et al. (2001), Miller and Sag (1997), Monachesi (1998, 1999), Rizzi (1982). See references at end of book for more information.